BSS Bulletin 28(i)

The British Sundial Society

BULLETIN

VOLUME 28(i)
March 2016

March 2016

GUIDELINES FOR CONTRIBUTORS

1. The Editor welcomes contributions to the *Bulletin* on the subject of sundials and gnomonics and, by extension, of sun calendars, sun compasses and sun cannons. Contributions may be articles, photographs, drawings, designs, poems, stories, comments, notes, reports, reviews. Material which has already been published elsewhere in the English language, or which has been submitted for publication, will not normally be accepted. Articles may vary in length, but text should not usually exceed 4500 words.
2. **Format**: The preferred format for text is MS Word or text files, which should be sent by email to *editor@sundialsoc.org.uk*. Material may also be sent on CD or as a typescript.
3. **Figures**: Pictures should be sent as separate jpg (do not over-compress) or tif files – do not embed them in Word files. For email attachments, do not exceed 10 Mbytes per message. For photographs, colour or black-and-white prints should be as large as possible (up to A4). Slides and transparencies are also acceptable. Drawings and diagrams should be in clear, strong black lines on a white background. Each figure should be referred to in the text, and a list of captions for the figures should be included. Captions should be sufficiently informative to allow the reader to understand the figure without reference to the text.
4. **Mathematics**: Symbols used for the common dialling parameters should follow the conventions given in the Symbols section of the *BSS Glossary* (available at *sundialsoc.org.uk/discussions/glossary-a-z/*). Consult the Editor if in doubt or for help in laying out equations.
5. **Notes**: The *Bulletin* does not use footnotes. Where additional information is required, each note should be numbered as a reference with a superscript number. For very long notes, use an appendix.
6. **References**: Sources are referred to in the text by a superscript number. They are listed in numerical order under the heading 'References' (or 'References and Notes') at the end of the article. The *Bulletin*'s convention is as follows:
   For books: Author's name; title of book in italics; name of publisher; place of publication; date in brackets.
   For papers and articles: Author's name; title of article in single quotation marks; name of journal in italics (this may be abbreviated); volume number in Arabic numerals underlined; first and last page numbers; date in brackets.
   Examples:
   A.E. Waugh: *Sundials, Their Theory and Construction*, Dover, New York (1973).
   J. Davis: 'The Zutphen quadrant', *BSS Bulletin*, 26(i), 36–42 (March 2014).
   A.A. Mills: 'Seasonal hour sundials', *Antiquarian Horology*, 19, 142–170 (1990).
   W.S. Maddux: 'The meridian on the shortest day', *NASS Compendium*, 4, 23–27 (1997).
7. **Acknowledgements**: These should be as brief as is compatible with courtesy.
8. **Address**: The email address of the author should normally be given, right-aligned and in italics, at the end of the article unless the author, when submitting the article, expresses a wish that this should not be done. Authors may, if they wish, supply a very short biography and photograph (see previous editions of the *Bulletin* for examples).
9. **Copyright**: The copyright of an article is held by the author. The copyright of photographs belongs to the photographer; authors who use photographs other than their own must obtain permission and should acknowledge the source in the caption. Authors who re-publish elsewhere material already published in the *Bulletin* are asked to refer to the *Bulletin* in the re-publication.

editor@sundialsoc.org.uk

***Front cover**: French ivory crucifix dial sold at auction by Charles Miller Ltd in May 2015 and described by Mike Cowham on page 7.*

***Back cover**: The north face of a multi-faceted dial from Castle Wigg, now at Aberdour Castle, showing the latitude and unusual Equation of Time table. For more details, see the story by Dennis Cowan on pages 27-29.*

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 28(i) - March 2016

CONTENTS

1. Editorial
1. Using a Sledgehammer to Crack a Nut? – *Frank King*
2. Three Sundials in a Country House Garden – *Nicholas M. Duke-Cox*
6. Dial Dealings 2015 – *Mike Cowham*
9. Reader's Letter – *Hogbin*
10. A Sundial from a Dublin Maker – *Adrian Le Harivel*
11. 'Dig for Victory' Sundial – *Martin Jenkins*
12. Could Anyone Mistake this for a Scratch Dial? – *Derek Humphries*
13. Kitchener's Sundial in Palestine – *Tommer Grossberger, Amir Freundlich and John Davis*
17. Sunrays Change Edges on Sharp-Edged Gnomons – *Tony Moss*
18. The Decorative Dials of Coaraze, Côte d'Azur, France – *Mike Cowham*
20. New Dials (1): Doha, Qatar, Analemmatic Dial – *Howard Peel*
21. An Unrecorded Transitional Mass Dial at Bixley, Norfolk – *John Davis*
25. Postcard Potpourri 34: Deene Park, Corby, Northamptonshire – *Peter Ransom*
26. In the Footsteps of Thomas Ross. Part 14: Aberdour Castle – *Dennis Cowan*
29. A Local Garden Centre Sundial – *Mike Cowham*
30. What Happened to the Calverley Sundial? – *Derek Humphries*
31. Equatorial Sundial in India – *Frank King*
32. New Dials (2): Armillary Sphere in South Wales – *Brad Dillon*
33. Holiday Sundial Sightings – *David Payne*
33. Trustees' Annual Report 2015–16
36. BSS Accounts for the Year Ended 31st December 2015

EDITORIAL

Our new Constitution requires many items to be published in advance of the AGM. In particular, the Trustees' Annual Report and the Accounts for the calendar year 2015 are published towards the end of this issue of the *Bulletin*.

Readers are reminded that their submissions for the three *Bulletin* articles that they most enjoyed reading in 2015 should be sent to *editor@sundialsoc.org.uk* very soon because the results will be announced at Liverpool.

Christine Northeast and Frank King are having to rein in their work on the *Bulletin*. Fortunately, David and Jen Brown are joining the team and we hope that normal service will continue without interruption!

Using a Sledgehammer to Crack a Nut?

This photograph shows a *circa* 1913 Francis Barker gnomon in a large press.

The gnomon was twisted and bent and I needed an expert who could straighten it. Mark Clarke, who has a small workshop near Cambridge, was the ideal person. He has much experience of working on historic aircraft at the Imperial War Museum at Duxford. In the past, he has unbent many bent components of Spitfires and unbending a bent gnomon was not a serious challenge!

Frank King

THREE SUNDIALS IN A COUNTRY HOUSE GARDEN

NICHOLAS M. DUKE-COX

In the midst of the woodland just north of the village of Woodhall Spa in Lincolnshire is a hotel named the Petwood. It has been a hotel since 1933, but before that it was the country residence of Grace Emily Blundell Maple.

Grace was the eldest and only surviving daughter of Sir John Blundell Maple Bt. Her father had joined the small firm set up by his father in Tottenham Court Road, London selling reproduction antique furniture. John Blundell Maple, with his business acumen, transformed the firm into a global selling enterprise, first tapping into the market created by the British Empire and then into the high-end of the home market. This gained him not only a fortune but also a baronetcy and Maple became a household name.

Fig. 1. Petwood north front, circa 1908 (reproduced with permission of the Woodhall Spa Cottage Museum).

In April 1896 Grace married the Baron Hermann von Eckhardstein at St Albans Cathedral in Hertfordshire. The marriage was not a happy one mainly due to the Baron's addiction to gambling and, like most addictions, not successful. He accumulated debts in today's money of just over £2,000,000, which were nearly all settled by his father-in-law. Sir John was obviously concerned over what would happen when Grace, as the sole beneficiary, received her inheritance and by extension so would the Baron.

Fig. 2. Looking south down the central path from the house, circa 1907 (reproduced from a damaged glass plate with permission of the Woodhall Spa Cottage Museum).

Fig. 3. Similar view as in Fig. 2, circa Spring 1908 (reproduced with permission of the Woodhall Spa Cottage Museum).

Fig. 4. Detail of dial in Fig. 3 (reproduced with permission of the Woodhall Spa Cottage Museum).

By the turn of the 19th/20th centuries Sir John knew he was dying from an incurable (at that time) kidney disease. He thus re-structured his Will setting up a trust stipulating two important points. The first was that Grace would get a not insubstantial annual allowance and therefore not access to all the money at once. Secondly, this allowance would rise by nearly 100% if she lived on an English estate for 240 days of the year.

Sir John died in 1903 and Grace, a frequent visitor to Woodhall Spa (the village then being at its pinnacle as an inland spa resort), sought her 'estate' there. She purchased some 40 acres of woodland north of the village and built her house in an early 20th-century Elizabethan revival style (Fig. 1).

It is thought that she employed William Goldring to design her garden with her late father's head gardener, Mr Williams, to supervise its layout. The garden contained typical Edwardian features of pergolas and topiary in an immaculate setting. Grace employed 14 full-time gardeners. The southern part of the garden was in effect a huge area of lawn bisected by a central path running north to south. At each end it was expanded: at the south to form an ornamental round pool and to the north a grassed area for a sundial.

The first six photographs accompanying this article were taken by one man, Mr John Wield. He was the only man on planet Earth who took images of the garden at this time, 1906–11. They were taken on dry-collodion glass plates which he developed himself. Thus knowledge of this garden, to the horticultural world, is largely unknown. Previous authors knew of its existence but not what it looked like.

What about the sundials? Here, the author would like to request the help of the Society's members to see whether similar dials are in existence. What I mean by similar dials, are the supports rather than the dials themselves which are not visible for scholarly interpretation in these general views.

The first sundial in this garden is recorded on a very early (damaged) glass plate (Fig. 2).

The sundial was initially set on a plain area of grass with no border and no substantial base for the dial, but then everything in this view is new. The terrace in the foreground has just been constructed; the topiary is still in its nursery delivery box. The supporter of the dial is a small curly-haired boy wearing a tunic. He is standing, slightly bending at the knees. He holds the dial above his head. A later view again shows the dial from behind (Fig. 3). Fig. 4 is a detailed view for our purposes of the dial

Figs 5 and 6. Looking north to the house from the central path (reproduced with permission of the Woodhall Spa Cottage Museum).

shown in Fig. 3. This 'little boy' sundial had a 'twin' which is also just visible above the white seat in the distant right of Fig. 3. This 'twin' held a basket of flowers and fruit above his head and was placed on a pedestal. The conclusion is that this pair were probably of mass manufacture. Their present whereabouts is unknown.

Fig. 5 is the only frontal view of which a detail, poor in quality, is included (Fig. 6). There was a cherub with a similar stance, holding a planter above his head at Harleyford Manor, Buckinghamshire (Fig. 7).

By 1910 Grace had obtained a divorce from the Baron. In August of that year she re-married. Her new husband was Archibald Weigall. The couple decided to live at Petwood and increase the size of the house and also the garden. For the garden, they called on the expertise of the then fashionable designer, Harold Peto.

Peto retained the basic structure of the first garden, introducing his own nuances to various areas. He did, however, stamp his own ideas on a new area situated to the south of the first garden. This again consisted of a huge grassed area with five new features, one of which will interest us. Peto also altered the area around the original sundial, creating a parterre, but retained the original area, replacing the 'little boy' dial with another (Figs 8 and 9).

Fig. 8 (above). View south down the central path, August 1915 (reproduced by permission of Country Life Magazine).

Fig. 9. Detailed view of the baluster dial from Fig. 8 (reproduced by permission of Country Life Magazine).

Fig. 7. In the garden at Harleyford Manor, 1910 (courtesy of Country Life Magazine).

The new dial support was of a classical baluster form. The column was round with appliqués of cherub masks linked by floral and fruit swags. The dial was set on a plate with a floral leaf-tip border. A round socle formed the base. The whole was set on another octagonal base, in turn placed on an octagonal plinth. This sundial went with the Weigalls when they left Lincolnshire for Berkshire in 1933. Its present whereabouts is unknown.

The third sundial is the most interesting. This dial's appearance in the garden is contemporary with the baluster dial. One of the features Peto built into his own 'south' garden was the Round Rose Garden. This was, in plan, of double-gourd shape with the smaller circle forming an entrance; the larger formed the rose garden. This was in four quadrants, the roses supported on chain-linked fencing. At the centre was the unusual pillar dial seen in Fig. 10.

Fig. 11 shows detail of this sundial. It consists of four Atlases supporting a globe on their backs. Atlas supporting

Fig. 10. The Round Rose Garden looking west, August 1915 (reproduced by permission of Country Life Magazine).

Fig. 11. Detailed view of the Round Rose Garden dial (reproduced by permission of Country Life Magazine).

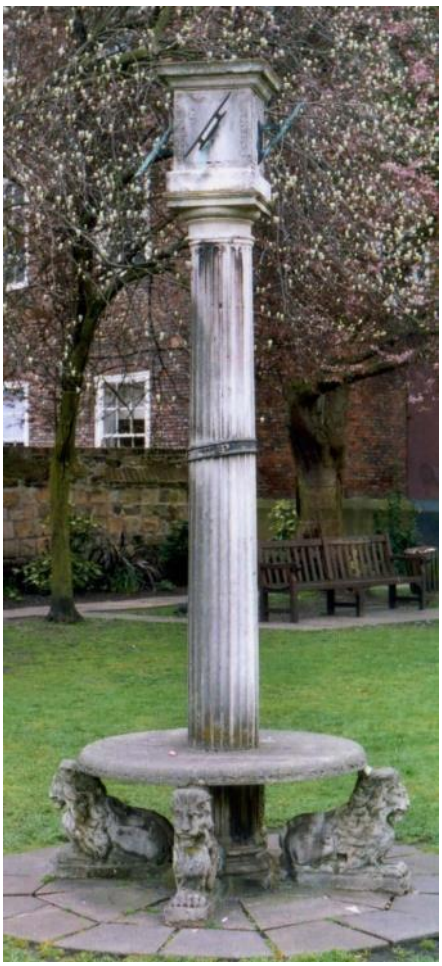


Fig. 12. Dial at College Street, York (photo: Ian Butson).

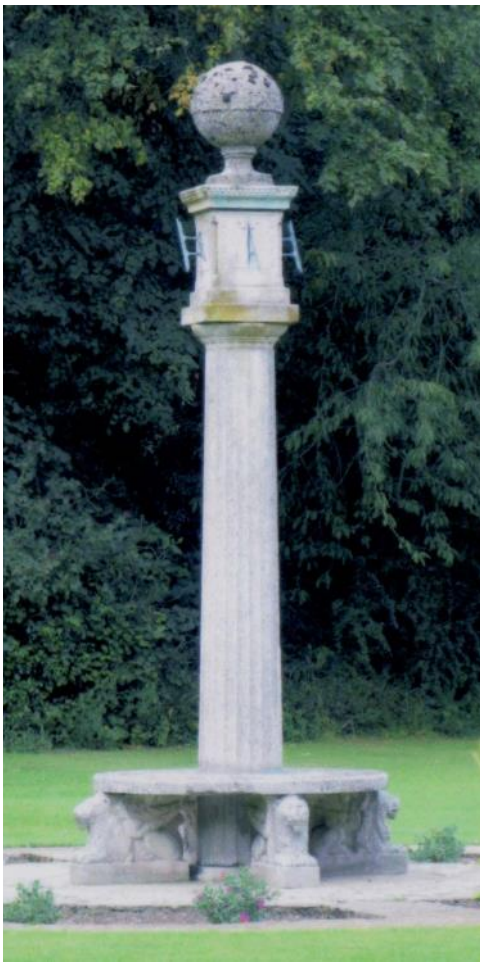


Fig. 13. Dial at Burton Agnes Hall, East Yorkshire (photo: C.M. North).

a globe is a common icon but the author has never seen four. The figures are set on a four-sided dial with correctly orientated gnomons. The whole in turn is on an Ionic capital column which is on a round base. The column appears to 'pierce' a round seat supported by four crouching lions. Current knowledge indicates that the Weigalls did not take this dial to Berkshire in 1933. Its present location is also unknown.

The appearance, though very pleasing and eye-catching, makes one wonder whether it is an accumulation of disparate elements. There was another piece of statuary in the Peto south garden which is definitely of this genre: a statue of Mercury set on a vase-shaped pedestal, which in turn is on a square pedestal, to give additional height.

The BSS Register includes two extant pillar dials also with a round seat supported by four lions: one in College Street, York (SRN 0271, Fig. 12) and the other at Burton Agnes Hall in East Yorkshire (SRN 6968, Fig. 13).

The author would like to hear from any reader who knows of similar dials or who can comment on the designs or who can supply information about the designers and manufacturers of the stonework noted above.

ACKNOWLEDGEMENTS

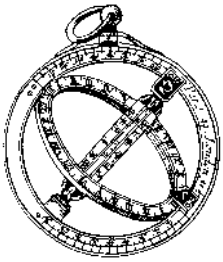
I am grateful to the directors of the Woodhall Spa Cottage Museum for permission to reproduce photographs from the Wield Collection. I thank John Foad, the Registrar of the BSS, for sharing with me Figs 12 and 13.

The information for this article is taken from the forthcoming publication
N.M. Duke-Cox, *The Gardens at Petwood – a pictorial history*, due to be published 2016.

Dr Nicholas M Duke-Cox was born in Surrey. He is now a retired General Practitioner who enjoyed gardening and its many facets as a respite from the pressures of professional life. This has continued in being a researcher for his local museum. He currently has a book in preparation on the definitive history of the Petwood Gardens. He can be contacted at *dcisnemo@gmail.com*

DIAL DEALINGS 2015

MIKE COWHAM



Here is my selection of the dials sold in 2015, the prices generally including the auction premiums unless otherwise noted. The market is still somewhat depressed but a few interesting and exciting dials have surfaced as can be seen below.

Christies, South Kensington. Travel, Science and Natural History. 23 April 2015

There were two items of interest in this sale. The first (Fig. 1) was a fine slate dial, French of 1746, of relatively small size being just 38 cm in diameter. It was made for a latitude of 47°, the approximate latitude of the river Loire, probably for a fine chateau somewhere between Nantes and

Fig. 1. French slate dial of 1746.

Dijon. Apart from having regular hours around the outside there were two further dials for Italian hours on the left and Babylonian hours on the right. All gnomons were missing. This fine specimen sold for just £1500.

Another lot in the sale was an unusual 'mechanical sundial', English from the mid-18th century (Fig. 2). The gnomon device is geared to the hands of the clock dial and when rotated to line up with the sun will show the time in hours and minutes. This interesting dial sold for £3250.

Fig. 2. 18th-century mechanical sundial.

Bonhams, Edinburgh. Summer Antiques Sale. 25 June 2015

An interesting English compass dial (Fig. 3) was sold with the maker's name of *J. Abraham BATH*. It is typical of

Fig. 3. Dial by Jacob Abraham.

English dials of the period but was well preserved. Jacob Abraham is recorded as a scientific instrument maker working in Bath and Cheltenham between 1809 and 1845.[1] The dial sold for just £350.

Fig. 4. French ivory crucifix dial from about 1620.

Charles Miller. Maritime and Scientific Models, Instruments and Art. 12 May 2015

An interesting ivory crucifix dial (Fig. 4) was in this sale. It is of a construction that I had not seen before. It is relatively small, being just 71 mm high and designed to be suspended from the neck of the user. The image on the front was, as usual, Christ on the Cross (Fig. 5) but the image on the underside was Mary holding the baby Jesus (Fig. 6). She is wearing a crown and appears to be standing on the crescent of the moon above six stars. To either side of her, along the cross arm, are cherubs' heads. When the dial is opened a metal arm may be raised, against a latitude

Figs 5 and 6. The two sides of the crucifix dial.

Fig. 7 (above left). A list of latitudes on the crucifix dial in gold on a blue background.

Fig. 8 (above right). Six cavities concealed below the latitude scale designed for holding religious or family relics.

scale, to set the dial exactly to the correct angle. A very small compass in the top of the main arm would be used to set it North–South. Its most interesting feature, for me, was the list of towns and their latitudes written in gold on a blue background (Fig. 7). The compass bowl was painted in a similar fashion. This is exactly like the dials that I wrote about in the June 2015 *Bulletin*[2] and whose origins I am seeking. Unfortunately, on this dial the town list is badly worn with some details now unreadable. The other interesting feature is the silver latitude scale that was held in position by a small latch. When released, six round cavities are revealed (Fig. 8); they were probably designed to hold religious relics or perhaps items, like hair, from family members.

The bidding took this fine dial way above its estimate of £4000–£6000 and it sold for £10,000 plus premium (£12,400).

Bonhams, Los Angeles. Fine European Furniture and Decorative Arts. 22 June 2015

In this sale was an interesting horizontal dial (Figs 9 and 10) MADE AT ORIELTON B^{y} R. GLYNNE FOR HUGH BARLOW OF LAWRENNY ESQ^{r} 1743. (Lawrenny is just north of Pembroke in SW Wales.) The outer scale of hours is divided into individual minutes. Inside the hour scale are towns around the world, from PEKING to MEXICO showing

Fig. 9. Horizontal dial by Richard Glynne.

Fig. 10. Inscription and instructions on Glynne dial.

their time difference, and inside this is a chart for the Equation of Time. At the centre is a 16-point compass rose and a scale dividing the whole circle into 256 divisions. Just below the signature are instructions for the use of the EoT scale. There is a vertically drilled hole in the gnomon positioned at the dial centre, which also has a hole, presumably for a vertical rod to show by its shadow the sun's bearing. This fine horizontal dial sold for $2500 (or £1656).

Charles Miller. Maritime and Scientific Models, Instruments and Art. 3 November 2015

There were several dials in this sale but I have chosen two that were a little unusual.

The first is an inclining dial (Fig. 11) signed 'I. Sisson *LONDON*'. It has an unusual octagonal dial plate with a rather 'solid'-looking gnomon. The dial itself, 4½ inches in

Fig. 11. Inclining dial by Jonathan Sisson.

diameter, is designed for 60° North but will function between 0° and 60° by tilting the dial plate against its latitude arc. Its compass is relatively large, being 2¼ inches in diameter. The dial has a Morocco leather case. It sold for £4650.

The other dial described is a silver Butterfield dial (Fig. 12) signed *BUTTERFIELD A PARIS*. Its unusual feature is that it has five chapter rings, most Butterfield dials having just three or four. The chapter rings are for latitudes of 43°, 46°, 48° 51′, 52° and 55°. It sold for £1200.

Fig. 12. Silver Butterfield dial.

Sworders, Stansted. Winter Country House Sale. 8 December 2015

In this sale was just the one dial. It was relatively large, being 11.5 cm in diameter and had its own carrying case. It is quite a precise dial, having two spirit levels in the

Fig. 13. Inclining dial by J. Watkins.

compass plate and three levelling screws (Fig. 13). Jeremiah Watkins is recorded as working at 5 Charing Cross between 1798 and 1810.[3] The dial sold for £780 plus premium.

ACKNOWLEDGEMENTS

The illustrations used in this article are the copyright of the various auction houses and must not be reproduced without their permission. Christies, South Kensington: Figs 1 and 2. Bonhams, Edinburgh: Fig. 3. Bonhams, Los Angeles: Figs 9 and 10. Charles Miller: Figs 11 and 12. Sworders, Stansted: Fig. 13.

REFERENCES

1. J. Wilson: *Biographical Index of British Sundial Makers.* BSS Monograph No. 2. 2007.
2. M. Cowham: 'Who made these ivory diptych dials?' *BSS Bulletin* 27(ii), 18–20 (June 2015).
3. G. Clifton: *Directory of British Scientific Instrument Makers 1550–1851.* Zwemmer 1995.

mike@brownsover.orangehome.co.uk

READER'S LETTER

Sundials Still Rule OK

Many of you will know that in order to keep UTC (often known as GMT in the UK), the world's civil and legal time reference scale, synchronised with the Earth's slightly erratic rotation, leap seconds are added as required at approximately annual intervals. This means that, even in this age of atomic clocks, what the time is on Earth is still officially linked to the position of the sun in the sky, in other words, the sundial.

I mentioned at my talk at the 2014 BSS Greenwich Conference that there was a move to abolish leap seconds because they could cause difficulties with some computer systems and that a decision was due to be taken in November 2015 at the World Radiocommunication Conference. The position of the sun in the sky has been used to tell the time throughout the whole of recorded human history and indeed it is the rising and setting of the sun that is used by humans and other life forms to set the natural rhythms of their bodies. Many of us thought that the separation of the world's civil and legal time from the position of the sun in the sky was a bad proposal in principle. It would also mean that cleverly designed and well-constructed fixed sundials, such as the Dolphin Dial at Greenwich, could, within a human lifetime, become over one minute out and, for future generations, would become embarrassingly inaccurate.

The good news is that, at the 2015 World Radiocommunication Conference, no decision was taken to abolish leap seconds. It was agreed that further research needs to be done and that the matter would be reconsidered in 2023. Hopefully, as progress in computer science is made, new ways for computers to deal with leap seconds will be found and sundials will continue to rule the time for many more millennia.

Martin Hogbin
Oxted, Surrey

A SUNDIAL FROM A DUBLIN MAKER

ADRIAN LE HARIVEL

A brass octagonal sundial (Fig. 1) by Dublin manufacturer John Fawcett (fl. 1765–93), 14.7 cm (5¾″) across flats, in a private collection, is a rare example of a Georgian dial by an identified maker. It is engraved with a central compass rose of eight points below the gnomon, the hours in Roman numerals, subdivided into halves, tipped with a feather end, quarters and periods of five minutes. The numerals run IIII–XII–VIII. It has been removed from its stone base, the brass dulled by exposure and showing some wear, and was screwed to a 20th-century mahogany mount as a table-piece, with felt underlay. The shape is octagonal, rather than the circular shape more common by the late 18th century, and at the small end of the normal size range. It is proudly signed JOHN FAWCETT/DUBLIN, aligned with the gnomon. Only one other dial by Fawcett is recorded, a slightly larger 17 cm across flats octagon signed Jn° Fawcett / MAKER DUBLIN.[1] The gnomon has an elaborate piercing (Fig. 2) that casts a fine shadow. It has proved surprisingly accurate in a second-floor Dublin apartment facing south-west, from 2 to 4 pm when the sun is out.

Figs 1 and 2. Brass sundial by John Fawcett of Dublin.

John Fawcett (fl. 1765–93) was the son of John Fawcett (fl. 1737–61), an optician and looking-glass maker. He had various Dublin addresses around Essex Quay by the River Liffey, latterly the charming 'Sign of the Golden Spectacles', a name used in London by the 1730s. His widow took over the business until her death in 1768, with their son joining her from 1765. John jnr then reappears at the 'Sign of the Figure of Time', 34 Dame Street, from 1775 to 1786, the principal street from Trinity College and the Parliament House to Dublin Castle, the outline of the house surviving as part of a terrace with modern shop fronts. He was now optician and watchmaker and had added sundials to his merchandise. Opticians often made barometers and scientific instruments at this date.

In London, Nathaniel Hill (fl. 1746–66), instrument maker at Chancery Lane, shows a sundial of similar design to Fawcett's on his trade card, while Thomas Blunt (c.1760–1822), mathematical instrument maker by Royal Appointment, at 22 Cornhill, lists sextants, spectacles, opera glasses and sundials amongst a long list of items for sale in his shop.

Fawcett moved to nearby 3 Grafton Street 1787–92, which was then developing as a shopping street, today with the highest rents in Dublin. He was last recorded at 133 Capel Street in 1793, something of a comedown. This had been the main road from the north into Dublin since the 17th century, not known for luxury goods, still lined by a mixture of more utilitarian shops today. Clockmakers with the surname Fawcett are found in 19th-century Yorkshire and may be related. Interestingly, this sundial resurfaced at a Yorkshire auction in 2013.

Dublin would still have been using local solar time when the dial was made and although Greenwich Mean Time became the legal Civil Time in 1880, even in 1893, *The Watchmaker, Jeweller and Silversmith* journal remarked that Dublin was 25 minutes behind Greenwich Mean Time.

REFERENCE

1. C. Mollan: *Visit of the Scientific Instrument Society to Dublin, May 1990: An inventory of scientific instruments in institutional collections included in the visit*, The Royal Dublin Society and EOLAS (The Irish Science and Technology Agency, 1990). Item 0702 NMD001. The dial is divided, unusually, to 3-minute intervals.

Adrian Le Harivel is Senior Curator and Curator of British Art at The National Gallery of Ireland, Dublin. He can be reached at *aleharivel@ngi.ie*

'DIG FOR VICTORY' SUNDIAL

MARTIN JENKINS

In October 1939 the Minister of Agriculture urged the British population to 'Dig for Victory' and pretty soon afterwards the nation's gardens were transformed from ones of flowers to ones of vegetables. Many of the country house parks and stately gardens would never be the same again, as post war they did not return to their original format.

Fig. 1. Sundial at Raynes Park, around 1940.[4]

It is interesting to note the reason for the Dig for Victory campaign. At the start of the Second World War Britain imported over 50 million tons of vegetables and fruit per year on average which included such common produce as apples, onions, and tomatoes. Because of port blockades, and shipping needed for military purposes, by 1940 the importation of fruit and vegetables was cut off completely.[1] So 'grow your own' became a necessity to supplement the commercial farming activities of the nation. The Ministry issued a leaflet in 1940, the first of several, containing a cropping plan for an average garden to keep a family of three adults and two children in fresh food for eight months of the year.[2] Presumably it was for three adults as one of them was 'grandma'? It would appear that the other four months would be catered for using stored food and preserves to supplement any other food supplies. This may not be as improbable as first thought. My father was in a 'reserved occupation' during the war, as he specialised in the manufacture of munitions, and in 1940 was relocated to Hinckley in Leicestershire specifically to turn hosiery factories into armaments and aircraft spares manufacturing facilities. The move meant that he was 'officially placed' in accommodation. The two elderly sisters with whom he was billeted made quite sure that he never went without dried fruit, preserves, jams, and pickles etc! In addition they also kept chickens so eggs were usually available to supplement any other rations, and they also baked their own bread. This does not mean, however, that those times were not difficult, far from it!

Overall, in gardens and allotments of whatever size or location, flowers were replaced by vegetables and fruit at this time. Similarly, seed suppliers and plant nurseries also had to change to supply fruit and vegetable seeds and plants in preference to flowers or ornamental plants, and to offer as much guidance as possible to gardeners.[3] However, some nurseries clearly tried to make the best of the new situation in 1940 by incorporating the pre-war garden layout and artefacts into the new vegetable-dominated nursery garden. The reasoning behind this was probably that they didn't think that the war would last long and that pre-war conditions would soon return with the garden reverting to its former flowery state soon after. An example is that at the Carter's Seed Company at Raynes Park where a sundial (Fig. 1) is located amongst the cabbages and rhubarb.[4] The dial appears to be a classical horizontal one mounted upon a stone pedestal, and given the era it was probably a good quality dial on a proper stone pedestal.

My research has revealed a little history about the Raynes Park nursery, but nothing about the dial. Apparently James Carter opened a retail outlet in High Holborn in 1863 selling seeds to friends and a small circle of customers. It proved to be a successful operation and led to the establishment of a nursery in Forest Hill, subsequently followed by the move to Raynes Park. At Raynes Park, James Carter established a 19-acre site, including glasshouses, seed beds, testing grounds and warehouses. The company became world famous, winning numerous awards for horticultural excellence. However, in the 1960s, the trading name was sold to Cuthbert's Seeds, and then in 1967 the land was sold and developed by Merton Council to form the Carters Housing Estate.[5]

But what happened to the dial? Another little mystery which a BSS member may be able to shed light on, and how many other nursery dials shared the Dig for Victory campaign?

REFERENCES

1. Second World War, Food shortages and Rationing WW2, *www.spartacus-educational.com,* accessed February 2015.
2. Dig for Victory Leaflet No.1, *Grow for Winter as Well as Summer*, Ministry of Agriculture (1940).
3. Carters Tested Seeds, *The Blue Book of Gardening, Catalogue 1940*, emergency edn, London (1940).
4. Carters Tested Seeds, *Grow More Vegetables,* Raynes Park, London SW20 (1940).
5. Merton Memories Archive, London Borough of Merton, *www.merton.gov.uk,* accessed December 2014.

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

Could Anyone Mistake This for a Scratch Dial?

From an Idea by Derek Humphries

This photograph shows an Ordnance Survey bench mark which is on the south-facing wall of St John's Church in Hildenborough, Kent. The church was built in 1844.

Close inspection shows a blemish in the centre of the horizontal line which looks suspiciously like a plug of lead for holding a gnomon in place.

Could it be that some prankster in the congregation, lamenting the fact that the church was too modern to have a mass dial, decided to upgrade this bench mark?

With a little bit of chipping away of the stone and the insertion of a plug of lead, one could add an iron spike which would serve as the gnomon. The resulting sundial would be properly delineated to show the times of the sunrise and sunset prayers as well as the office of Sext at midday.

Unfortunately, the mid-morning and mid-afternoon lines do not radiate from the root of the gnomon and they slope too steeply downwards. Even if they did radiate from the root of the gnomon, worshippers would find themselves arriving late for Terce and early for None.

The hypothetical prankster gets a few marks for inspiration but not very many for execution.

derek29cr@hotmail.com

KITCHENER'S SUNDIAL IN PALESTINE

TOMMER GROSSBERGER, AMIR FREUNDLICH and JOHN DAVIS

Horatio Herbert Kitchener (1850–1916) is very well-known to most people as the face on the famous First World War recruiting poster 'Your Country Needs You!'.[1] What is generally not known is that, long before he was a very senior British Army Officer, he was commissioned into the Royal Engineers and, when serving in Palestine, he presented a sundial which he had probably designed himself to his hosts. The sundial still exists and is currently being re-installed in its original location.

Fig. 1. Detail from 'The main street of the German colony' by Emily Cuthbert (1884) showing the Schumachers' house. Insert: close-up highlighting the sundial on its pillar.
© The National Maritime Museum, Haifa.

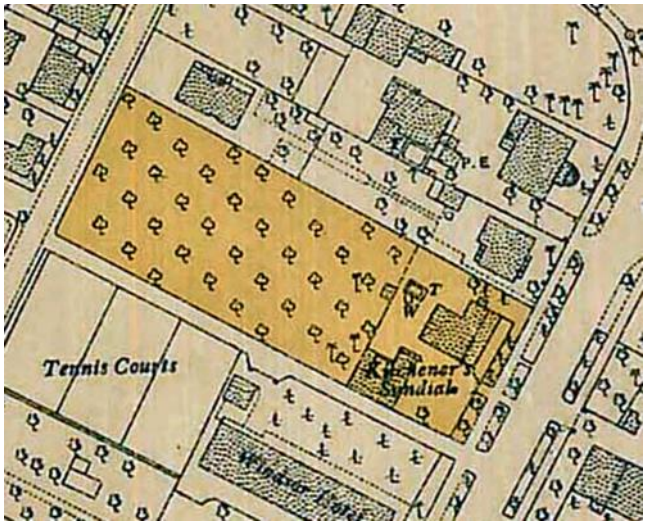


Fig. 2. Detail from a 1936 map of Haifa showing the location of "Kitchener's Sundial".

Background

In 1874, at the early age of 24, Kitchener was assigned by the Palestine Exploration Fund to a mapping survey of the Holy Land, later to be known as the Survey of Western Palestine. Owing to the death of the previous leader from malaria, Kitchener was made joint leader with another officer (Claude Conder[2]) and later they wrote the first three volumes of the eight-volume Survey report together.

During the Survey, Lieutenants Kitchener and Conder were hosted by Jacob Schumacher at his house in the Templar colony in Haifa (Figs 1 and 2). Schumacher, an architect and stonemason, was one of the founders and planners of the colony, and served as the U.S. consular agent in Haifa. Schumacher's son Gottlieb, later an eminent engineer, architect and archaeologist, was only 16 at the time. One can imagine the impact of the surveyors on the young man, soon to be one of Palestine's greatest surveyors and researchers in his own right. In 1875, before a brief return to England, Lieutenant Kitchener gave Schumacher an east–west sundial, made of a vertical brass plate with perpendicular end pieces, the top one with two small apertures, designed to let fine and accurate rays of light fall onto the bottom end piece, marked with the hours of the day and incorporating a split analemma designed to show the local mean time. The sundial was documented in words and painting, and appears on maps of Haifa, but was not photographed at that time.

Jacob Schumacher died in 1891. Gottlieb Schumacher, who joined the Ottoman army in the First World War as an

Fig. 3. Modern photograph of the marble plaque commemorating Kitchener, added in 1925.

Fig. 4. The sundial as it currently exists, viewed from the NE.

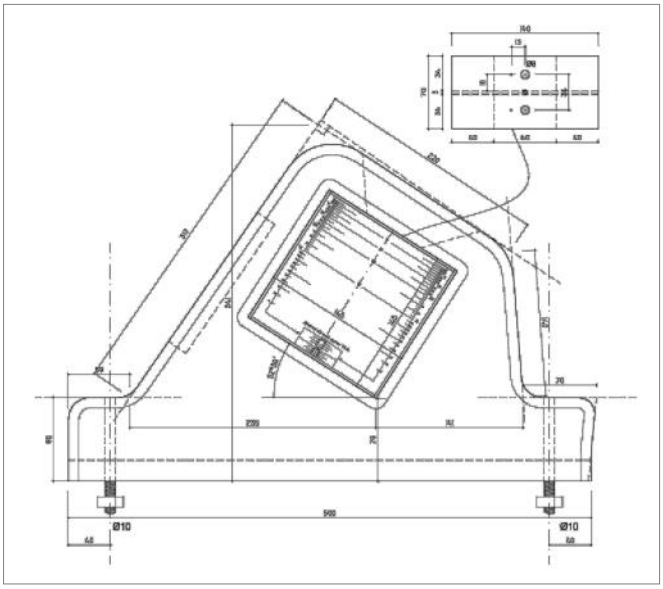


Fig. 5. Engineering side view of the complete structure.

engineering officer, was refused permission to return to Palestine after the war and stayed in Germany. During that period, the sundial was knocked down. In 1924 the British government finally agreed to let Schumacher return to Palestine, but he was in bad health and he died in 1925. In that year the sundial was 'restored' and put back in its place, now carrying a marble plate commemorating Lord Kitchener on its rebuilt structure (Fig. 3).

In 1948, after most of the Templars left or were deported from Israel, the house was leased to the Grossberger family, who kept the sundial but never inquired about its use or the way it operates.

In 2015, during a documentation process of the Schumacher house, the sundial was studied in detail and its features drawn, as described below.

There is good evidence that the sundial was actually used as a regulator of the local clocks. Gottlieb Schumacher's seventh daughter, Nelly (1896–1991), who stayed in Israel long after the Templars had left the country, wrote a biography[3] in which she described the sundial in detail:

"In our yard stood a tall pole. Every Sunday my brothers would raise the stars and stripes flag on it. Next to the pole stood our famous sundial, a present from Lord Kitchener to my father. The sundial was surrounded by a green wooden fence. It was made of a small, round marble panel, placed on a stone pedestal, on which two parallel metal plates were positioned with a slant. Once a ray of light entered a slot in the plate, illuminating a certain spot, we knew it was exactly 12:00 o'clock. Prior to that time, Grandfather Lange would come from the community house across the street with a whistle in his pocket. His granddaughter Theodora would stand by the bell rope in the great community house. Once grandfather blew the whistle, Theodora would pull on the rope. The clear sound of the bell would echo over the colony houses, and everybody would hurry and set their clocks. Thus, our time keeping was no less accurate than today's radio signals."

The Sundial Design

An overall view of the existing sundial is shown in the photograph of Fig. 4 and the engineering drawing of Fig. 5. It is believed that the physical casing of cast concrete which supports the internal plates was added when the dial was restored in 1925: the marble plaque of Fig. 3 is embedded in its northern face. It is unclear what the original appearance of the dial would have been – the plates may simply have stood on an angled marble disc. The existing concrete structure not only supports the (original) brass plates but also provides a dark interior allowing maximum contrast for the bright sun-spot. The rectangular openings have heavily chamfered edges to allow the sun to enter at a slightly oblique angle and to facilitate viewing. Although the concrete casing provides a very secure structure for the dial, it severely restricts its operation, reducing it from a dawn-to-dusk dial to a meridian line. One reason why it may have been considered acceptable to reduce the functionality of the dial in this way is that the site became overshadowed by trees, as can be seen in an early (1917) aerial photograph taken by the Australian Flying Corps, so that the dial functioned only when the sun was high in the sky.

The original and key part of the design is a double-sided brass plate approximately 3 or 4 mm thick with a top and bottom plate to form an 'I' shape, as can be seen in the 3D drawings of Fig. 6. The main upright of this structure lies in the meridian plane and the 'I' is slanted at an angle of around 32½° so that the tops and bottoms of the plates lie in the polar plane (the latitude of Haifa is actually 32.82° N). Small circular apertures in the top plate are thus positioned to be perpendicular to the sun at noon on the equinoxes. These apertures are countersunk to allow angled rays to enter.

The engraving on the plates is shown in Fig. 7. The operation of the original dial (without the concrete casing)

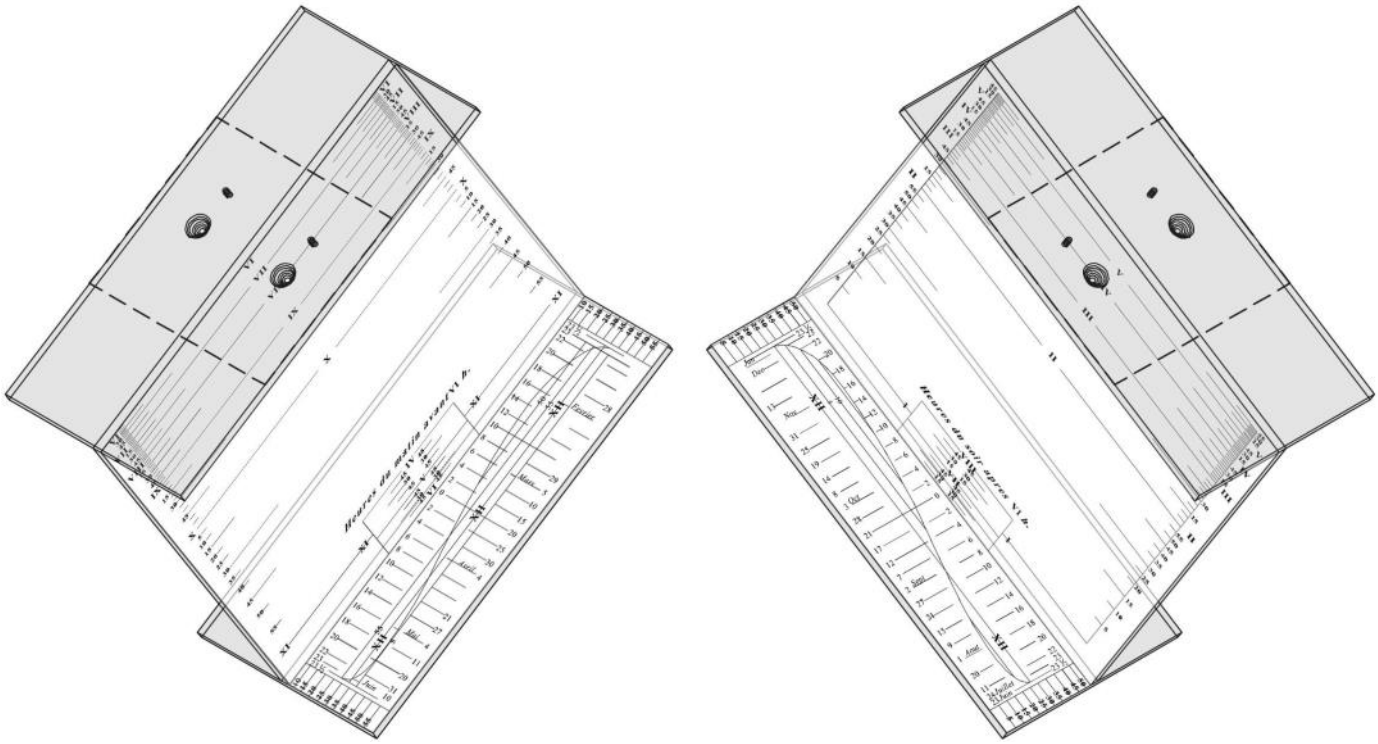


Fig. 6. Two 3D drawings of the plates showing the overall 'I' structure.

can be understood as follows. At 6 am, the shadow of the eastern edge of the top plate will lie along the eastern side of the upright plate. During the morning, it will travel down the plate, always lying parallel to the top plate and indicating the time on the engraved scales. At about 11:10 am, this shadow will pass onto the bottom plate and the minutes past 11 am will continue to be indicated by the numbers nearest the edges of the plate. At the same time, two small sun-rays coming through the apertures in the top plate will produce spots of light on the east and west sides of the bottom plate, now conveniently in shadow. The analemma has the time of solar noon marked as XII and a

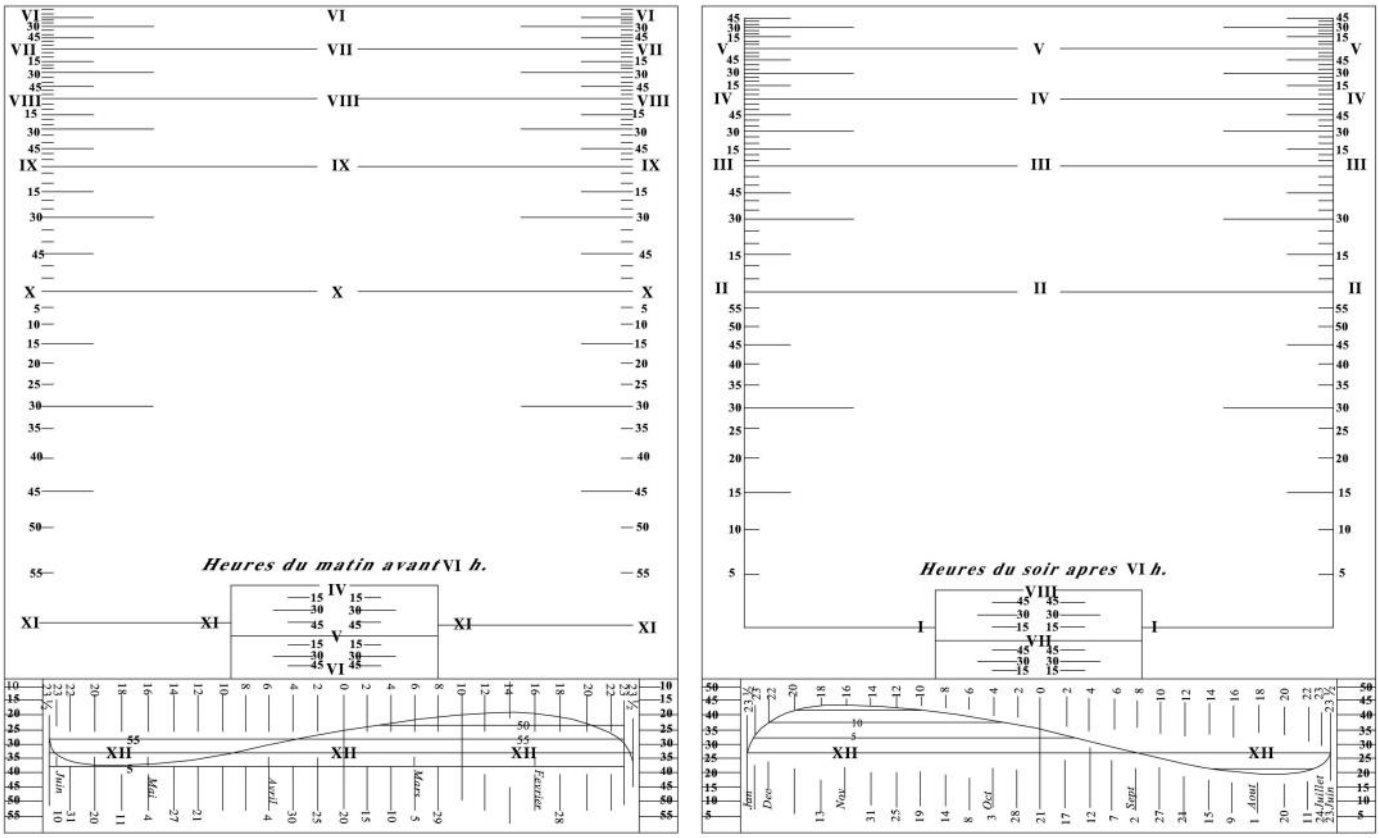


Fig. 7. Drawing of the engravings on the east (left) and west (right) plates. Note that the analemma sections at the bottom are actually at 90° to the plane of the drawing.

few minutes either side of that are numbered in Arabic numerals. Solar noon will be indicated simultaneously on both half-analemmas. The analemma scales also show the sun's declinations in degrees and the corresponding dates, with the period from the winter solstice to the summer solstice on the eastern part and the other half-year on the western one. Knowing the date, the appropriate half can be selected to give the correct time of (mean) 12 o'clock.

At approximately 12:05, the shadow of the western edge of the top plate will appear on outside edge of the western bottom plate and will move towards the upright plate, passing onto it at around 12:55, as indicated by the scales outside the (separate) analemma. It will continue upwards during the afternoon, until 6 pm.

One feature which is rarely seen on east–west dials is the two small subsidiary timescales, operating over the summer half of the year and positioned near the centre of the analemma. That on the east plate is labelled "*Heures du matin avant* VI *h*" (morning hours before 6 o'clock) and on the west plate "*Heures du soir apres* VI *h*" (evening hours after 6 o'clock). These scales give an extra 4 hours of time range when the sun can be found above the horizon to the north of the E–W line: this is rather more than is actually required at this latitude. Only parts of the bottom plate would cast a shadow on these scales.

The dates of the equinoxes shown by the analemma, when the declination is zero, are 20 March and 21 September. These are very close to the current, Gregorian, dates. The extremes of the EoT are difficult to interpolate accurately from the scales but are clearly in excess of –16 minutes in early November and around 14m 30s in February (the actual values for 1875 were –16m 19s and 14m 30s respectively[4]). It is not known where Kitchener obtained the data for the analemma but a copy of the Nautical Almanac is highly likely. Note that the analemma makes no allowance for a longitude offset: the times are all local ones. The dial was made some nine years before the 1884 International Meridian Conference in Washington D.C. when the Greenwich Meridian was formally adopted as the origin for the world's longitudes, and the 15°/1hr time zones were set.

Fig. 8. Photograph of the eastern side of a model of the dial, indicating 8:35 am local solar time. © Arch Amir Freundlich 2015.

It is initially a puzzle why the labels, and the months on the analemma, are written in French. The most logical of languages would have been English or German. However, although the French community in Palestine at that time was small, the use of French for official documents was still quite standard. Kitchener was very pro-French, having been to school in Montreux (his parents were living in Switzerland) and having joined the French field ambulance service in the Franco–Prussian War. It seems unlikely that there was a French mathematical instrument maker in Palestine that Kitchener could have used to make the dial – a Royal Engineers workshop seems a more likely choice.

Study of the Kitchener sundial continues and an accurate replica of the plates has recently been made with the intention of experimenting with it *in situ* (see Fig. 8). It remains a fascinating example of what at the time would have been one of the most sophisticated and accurate dials in existence.

ACKNOWLEDGEMENTS

We are grateful to Frank King for fruitful discussions on the functioning of the dial.

REFERENCES and NOTES

1. Kitchener (later Field Marshal and the 1st Earl Kitchener) has an extensive biography in the *Dictionary of National Biography* (OUP) and briefer details of his life can be found on Wikipedia.
2. Claude Reigner Conder (1848–1910) was a great-great-grandson of Louis-François Roubiliac and had met Kitchener at school.
3. Nelly Marcinkowski-Schumacher: *Rain from Clear Skies, my life with Wladimir Ph. Marcinkowski* (1994). Originally published in German in 1978 (Wuppertal: R. Brockhaus).
4. Edward Dent, table in the instructions for a dipleidoscope.

Tommer Grossberger is a neuropsychologist and works in rehabilitation of the mentally and socially challenged. Tommer's family have lived in the Schumacher House in Haifa since 1948 but never enquired about Kitchener's sundial inside it until recently, when a conservation project of the building took place. Tommer lives in Binyamina and can be contacted at *tommergros@gmail.com*.

Amir Freundlich, B.Arch. Cum Laude (2001) from the Technion – Israel institute of technology – specializing in Conservation of historical and archaeological sites. He documented Schumacher's House in the Templar Colony in Haifa (July 2015) by request of the Grossberger family (contact: *amfreundlich@gmail.com*).

SUNRAYS CHANGE EDGES ON SHARP-EDGED GNOMONS

TONY MOSS

This short article has its origin in one of my first commercial dialling projects viz. 'dialling scales' as used to set out sundials without the need for calculation and described in Frank Cousins' book.[1] Having produced a small experimental batch in stainless steel I felt the need to provide a booklet describing the process of setting out and making a sample dial illustrated by a line drawing of the finished item with its thick plywood gnomon.

Not long afterwards I received a kindly letter from a BSS member pointing out that I had made a common beginner's error in my dial layout which did not account for the fact that sunrays change gnomon edges at 6 am and 6 pm. Getting it wrong was embarrassing but getting it wrong in print doubly so. The sunray changeover at noon resulting in a 'noon gap' is perhaps more commonly known and recognised.

In recent days at least two similar instances of such dials actually in production suggested a need for this article mainly aimed at beginners in dialling.

REFERENCE

1. F.W. Cousins: *Sundials,* John Baker, London (1969).

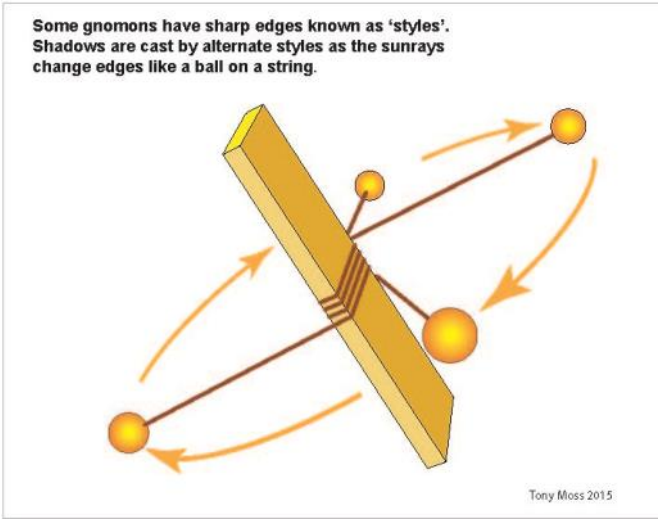
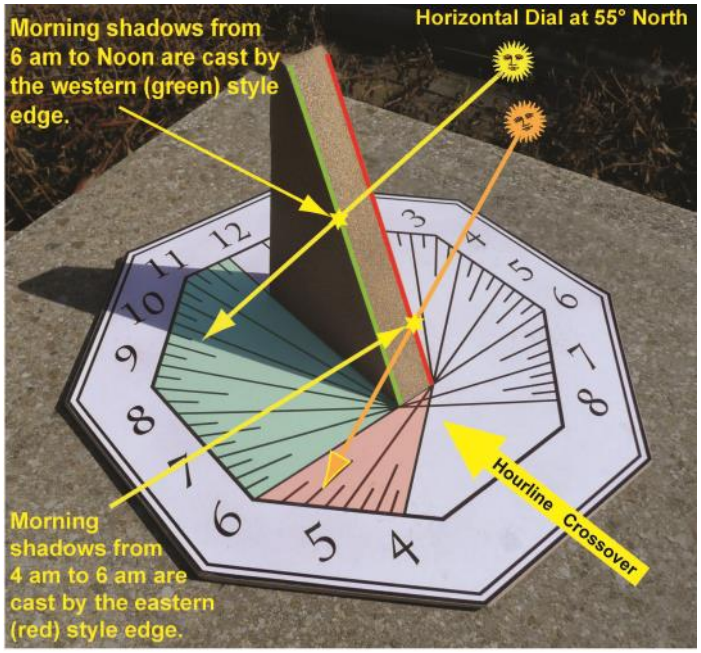
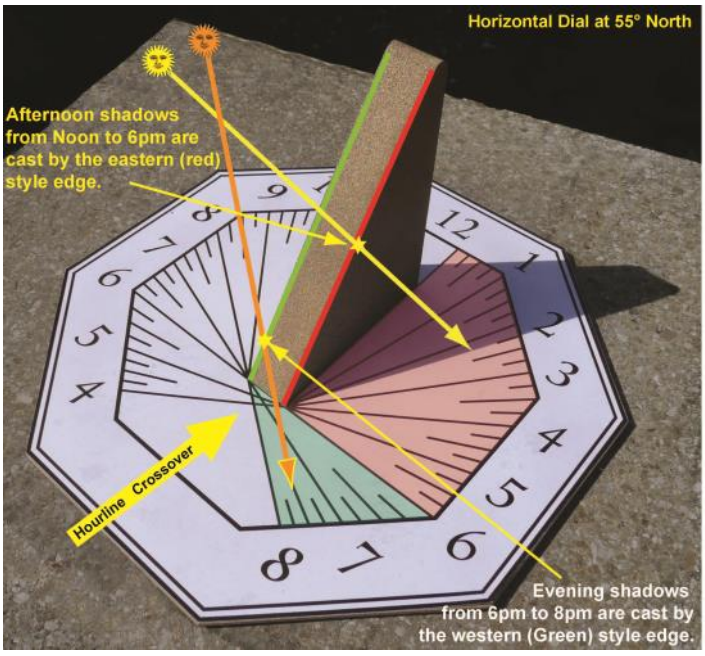


Fig. 1. This illustration shows a wooden plank being wrapped in string by a ball rotating around it. Imagine that the ball is the sun and you can see that the string (sunray) pivots around each edge in turn.





Figs 2 and 3. Illustrating how hourline crossover arises, with the dial faces coloured to show shadow coverage and crossover point.

lindisun189@gmail.com

THE DECORATIVE DIALS OF COARAZE, CÔTE D'AZUR, FRANCE

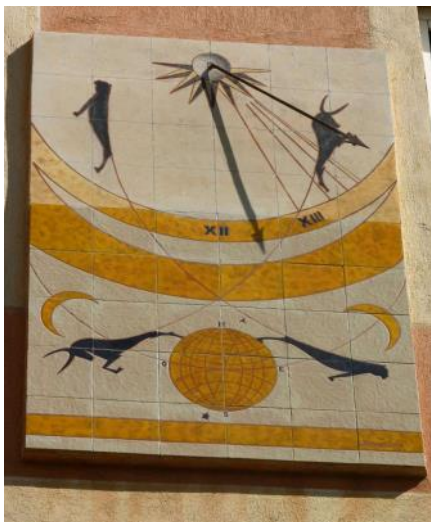
MIKE COWHAM

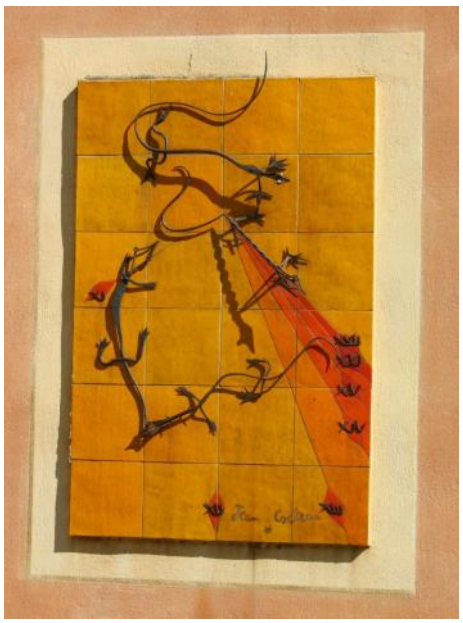
During a stay in Nice on the French Riviera we decided to visit some of the mountain villages in the Alpes Maritimes, the region behind Nice. A tourist leaflet about 'Perched Villages' led us to some interesting places, many with dials, including the village of Coaraze and its 'most decorative' sundials.

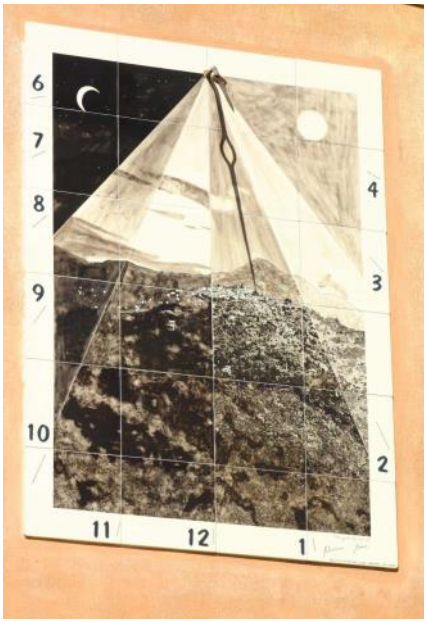
Coaraze stands on a rocky peak, 650 metres above sea level and 25 km north of Nice. In 1959 the mayor Paul Mari d'Antoine, with his friends Georges Douking and the polymath Jean Cocteau, decided to make a special feature of twelve artistic sundials to attract visitors to this not-too-accessible region.

Several famous artists were asked to make dials, including Jean Cocteau, Georges Douking and Mona Christi. The first were installed in 1961 on the front of the town hall (Figs 1–5); one of these, by Cocteau, depicted lizards (Fig. 4), the lizard being the emblem of Coaraze. The project was abandoned before all twelve sundials were made, but it was restarted by a new municipality in 2008, and several more now grace the walls of the village.

I think that we saw all of the major ones and found a few (but not all) of the various dials on private houses. All but the last three dials illustrated are about 1 metre wide. The dials are not all easy to read, some being more artistic than







Figs 1–5. The five dials on the Mairie.

Upper left: "Les tournesols" (The sunflowers) by Gilbert Valentin.

Upper right: "Les animaux fabuleux" (Animals of fables) by Georges Douking.

Lower left: "La chevauchée du temps" (The cavalcade of time) by Mona Christie, with motto "Pur Sang Signe le Temps" (Pure blood shows the time).

Lower centre: "Les lézards" (The lizards) by Jean Cocteau.

Lower right: Dial by Fabienne Barr.

Figs 6–8. Left, dial by Henri Masscheron. Centre, dial by Sacha Sosno, 2008. Right, "La python et sa couronne en vert et or" (The python and his crown in green and gold) by Henri Bernard Goetz.


Figs 9–11. Left, "Blue time" by Angel Ponce. Centre, "Lou temps passa, passa lou Ben" (The time passes, pass it well) by Ben, 2008. Right, dial on the school by Patrick Moya, "La Journée d'un artist Mediterranéen" (The day of a Mediterranean artist).



Figs 12–14. Left, dial across the road from Le Chapelle Bleu, inscribed "On ne voit bien qu'avec le coeur" (We see everything well, thanks to the heart). This dial uses a 24-hour clock. Centre, dial on a house signed Moika 2009, "Siàu l'ombre dau temps que passa" (I am the shadow of time passing). Right, small dial on a house, with the hours marked by dots, again using the 24-hour clock.

practical timekeepers. The majority of these dials, as with many others in this region, are made from painted and glazed tiles. The one in Fig. 5 was badly damaged, the bottom three rows of tiles having fallen off the wall, but these have now been replaced.

ACKNOWLEDGEMENTS

I would like to thank Michel Lalos for his helpful website which gives further details of many of these dials.

http://michel.lalos.free.fr//cadrans_solaires/autres_depts/alpes_maritimes/coaraze/cs_06_coaraze.html

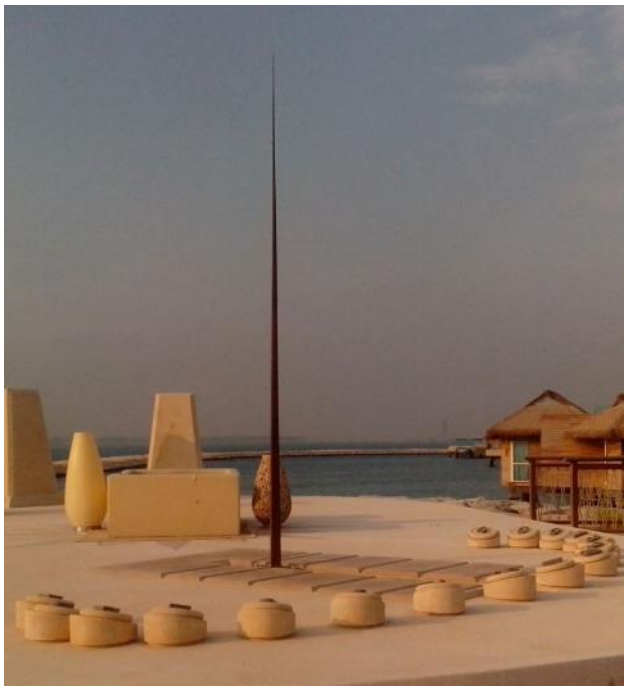
I would also like to thank Denis Schneider for helping me with the translations of some of the titles, some of which are in Provençale, and particularly that of Fig. 10. Ben is a play on words: Ben = bien!

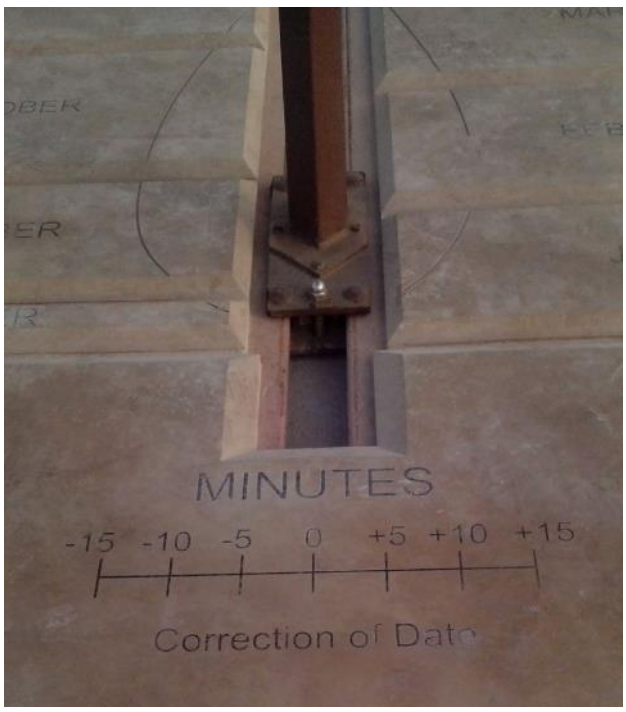
mike@brownsover.orangehome.co.uk

NEW DIALS (1)

Doha, Qatar, Analemmatic Dial

This dial is at the Doha Anantara Island Resort and Spa (25.29° N, 51.65° E) and was designed by Howard Peel of Sundials Exclusive, South Africa. The design brief was for a large, easy-to-read dial with some human involvement, the last requirement being met by the hotel staff who move the gnomon slightly in its sliding track each day. The latitude, just outside the Tropic of Cancer, dictates that the central date scale must run almost up to the hour ellipse, and the very tall gnomon. The hour points, which allow for the local longitude, are of a modern design and are lit up at night, appearing to float. The dial is accompanied by a large compass rose on the paving alongside.





The date scale incorporates an analemma, allowing the Equation of Time for the current date to be estimated from the scale at the bottom. This can then be used to convert the solar time for the local time zone, as indicated by the dial, into the appropriate Civil (mean) Time.

Howard Peel info@sundialexclusive.com

AN UNRECORDED TRANSITIONAL MASS DIAL AT BIXLEY, NORFOLK

JOHN DAVIS

Mass dials,[1] considered individually, rarely tell us anything significant about the development of time-keeping. They are almost impossible to date and their hour-lines tend to be either very simple and geometric or else totally empirical and almost random. The dial which was once at St Wandregesilius's church in Bixley, Norfolk, is something of an exception as it can be partially dated and its numbered hour-lines do provide some clues to the manner in which the equal-hour system came to be introduced in England. The Bixley mass dial has been unrecorded and largely overlooked until recently owing to the chequered history of the church.[2]

Fig. 1. St Wandregesilius's church, Bixley, drawn by Ladbrooke in 1824 (before the Victorian rebuild), now part of the Blomefield collection (BL MS Add 23025, f. 200).[10] *Photographed by the author, with the permission of the Trustees of the British Library.*

St Wandregesilius's Church

Bixley was a small hamlet a couple of miles to the south of the old Norwich city walls; today, it is just a forgotten parish and a name on the OS map.[3] Although it is probable that it had a Saxon church, this was totally removed when it was refounded in 1272 and dedicated to St Wandregesilius, now a unique dedication in Britain. The benefactor for the rebuilding was a certain William de Dunwich (1245–72). The town of Dunwich, just over the border in Suffolk, was at this time the most important port on England's prosperous east coast and had yet to suffer the series of calamitous storms in the 14th century which washed away most of the town and silted-up its port. William de Dunwich was a wealthy draper and trader who had moved to Norwich where he was also a Bailiff of the city. He provided much of the funding for setting up the Great Hospital there, built right beside the Cathedral. In 1272 there was a violent uprising between the cathedral-priory and the townsfolk (involving such feats as monks firing crossbows!) which eventually led to the intervention of the king who took the matter to the Pope, resulting in the excommunication of the whole of the city. William de Dunwich had been heavily involved, supporting the townspeople, and clearly felt that his soul was imperilled so, as he wrote his will shortly before his death later in that year, he felt the need for more good deeds and the foundation of a new church: the choice of Bixley is explained as lying just outside the excommunicated region.

We know that the church was founded by William de Dunwich because the foundation stone bears the inscription:

> ANIME WILEMI DE DONEWICO FUNDATORIS
> HUIUS ECCLESIE PROPICIARE DEUS
>
> (Oh God atone for the soul of William of Dunwich, founder of this church)[4]

This stone was incorporated as one of the quoins at the south-east corner of the church with the inscription propitiously facing East: it is especially important to us because on its southern face there is a mass dial of rather better than average quality.

The choice of St Wandregesilius for the dedication is a puzzle. He was a noble member of the Merovingian Court of the seventh century who became a monk and founded his abbey at Fontenelle near Rouen in Normandy, consecrated as St Wandrille in 657 AD. Although the dedication is now unique to Bixley, there were other English churches with this dedication in both the Saxon and Norman periods; some of those churches, like Bixley, professed to have relics of the saint.[5] He is sometimes described as the patron saint of Flemish weavers though I have not found firm evidence of this. If so, and as William de Dunwich had much trade with this area and Norwich's wealth was built on the wool trade, this might possibly account for St Wandregesilius's selection as patron saint.[6]

Bixley church remained largely unchanged for the next five centuries: it is seen in Fig. 1 as it would have looked in the early 19th century. It was part of the pilgrimage route around Norfolk[7] and at one time had a painted and gilded image of St Wando (as his name is sometimes given) as well as one of Henry VI.[8] We owe our detailed knowledge

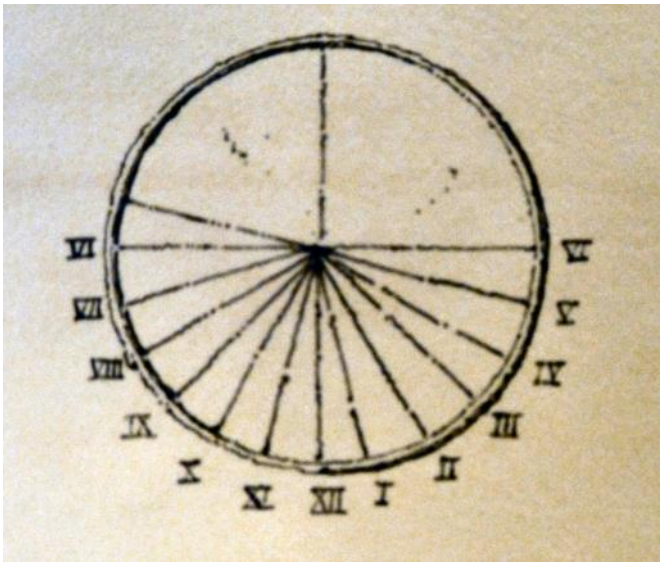


Fig. 2. Drawing of the Bixley mass dial, copied as part of the Blomefield collection (BL MS Add 23025, f. 202)[10] from "the Norris MSS". Photographed by the author, with the permission of the Trustees of the British Library.

Fig. 3. Drawing of the Bixley dedication stone, copied as part of the Blomefield collection (BL MS Add 23025, f. 202)[10] from "the Norris MSS". Photographed by the author, with the permission of the Trustees of the British Library.

Fig. 4. The remains of St Wandregesilius's church in June 2015.

Fig. 5. Some of the pallets with the salvaged monuments and stonework from St Wandregesilius's church, in a dark local barn. It was thought that the foundation stone and mass dial would be amongst this material but the author failed to find them in June 2015.

of the foundation stone and its mass dial to the fact that it was sketched in the mid 18th century by the local antiquarian Anthony Norris and this drawing[9] was later copied by Francis Blomefield when he was preparing material for his *Topographical History of Norfolk*.[10] These copies (Figs 2 and 3) later became part of the Dawson Turner Collection and are now in the British Library.[11]

In 1868, during the Victorian craze for rebuilding churches, it was completely replaced with the exception of the tower (square, unlike the characteristic round towers of many medieval Norfolk churches). The foundation stone was recognised as a rare and important artefact and moved to a place of 'safety', built into an internal wall in the chancel. It survived here until an arsonist torched the church in 2004, using the large gas cylinders providing the church heating (it was completely off the grid) as a fuel source and leaving the building today as a set of walls with some charred rafters at the end of a long, overgrown path (Fig. 4).

After the fire, the calcified monuments from inside the building and some of the decorative stonework were removed and stored in a local barn belonging to Sir Timothy Colman (a member of the famed mustard company family) where they remain, on over twenty pallets (Fig. 5). It was thought that the foundation stone was amongst this stonework but an inspection by the author in June 2015 failed to discover it. Luckily, photographs (Figs 6 and 7) had been taken by Caroline Rawlings[12] soon after the fire and before the stone was removed which show that it had cracked – it is believed that it broke into several pieces on removal. These photographs are the only ones we currently have for comparison with the 18th-century drawings. For the moment, this is the end of the story.

The Bixley Mass Dial

Turning now to the actual dial (Fig. 2), we can see that the basic division is into twelve nominally equal 15° segments in a semicircle below the horizontal together with one line above the horizontal. The lines – not the intervals between them – are numbered with Roman numerals VI–XII–VI. The dial could thus be described as a 'transitional' one, predating the introduction of proper scientific dials with polar-oriented gnomons and showing equal hours – that is, numbered according to this scheme with XII at noon rather than the old unequal hour scheme which has noon as the end of the sixth hour. Some evidence that the gnomon was a normal horizontal one is in the photograph of Fig. 6 and although the possibility of a 'bent rod' emanating from a horizontal hole cannot be entirely ignored, it is extremely unlikely. Of course, equi-spaced 15° lines and a horizontal gnomon cannot display equal hours with anything like accuracy, providing a passable approximation to this only at the equinoxes and getting progressively worse in other parts of the year.

Some comments should be made about the fidelity of the drawing of Fig. 2. The angles are rather variable and the hour-lines seem to have been drawn freehand, by eye. The numerals are all drawn aligned horizontally whereas the photograph of Fig. 6, although not totally clear, seems to show them set radially. Also, the 4 pm line is marked IV which had become standard on clocks by the Victorian period but would certainly have been written as IIII in medieval times. Comparison of the photograph of the inscription on the foundation stone (Fig. 7) with the drawing of it in Fig. 3 also shows some inaccuracies. Maybe Norris's original drawings were more accurate: efforts are still in hand to locate them, together with the remnants of the actual stone. Nevertheless, the important basic features of the dial design in Fig. 2 are supported by the photograph.

The key question about the dial is its date. Clearly it cannot be earlier than 1272 and the Norwich Heritage Explorer website[13] rather unhelpfully describes the dial as "later". This is almost certainly true but the question is how much later! Obviously it was an item of some antiquity by the mid 18th century but that does not narrow things down much.

The term 'transitional' for a mass dial does not have a formal definition.[14] It is generally applied to mass dials with lines at a regular 15° spacing and usually reserved for cases where they are numbered, as in the Bixley case. Cole,[15] writing in the 1930s, assumes, on the basis of no evidence whatsoever, that the dials had the gnomon bent downwards into the polar direction, though this is not necessary. Green,[16] a few years earlier, also espoused the idea of bent-rod gnomons, spending two chapters of his book on experiments with modern reproductions but giving almost no evidence that any medieval dial had ever employed them.

Fig. 6. The Bixley mass dial on the side of the dedication stone, photographed inside the church after the 2004 fire. Photo courtesy of Caroline Rawlings.

Fig. 7. The Bixley dedication stone, photographed inside the church after the fire of 2004. Photo courtesy of Caroline Rawlings.

Very early scientific dials, carved directly into church walls and with an inset triangular plate gnomon and geometrically-calculated hour lines, can look very similar to a transitional mass dial and it is tempting, but probably erroneous, to assume that they followed on directly in time. Scientific dials appeared at least by the early 16th century so this hypothesis would put transitional dials in the late 15th century. However, we know that a century earlier, in the 1390s, Robert Stikford in St Albans developed an *accurate* method of displaying equal hours on a vertical dial with a horizontal gnomon (of specified length).[17] This information would have taken time to spread around the country to makers of real dials but it shows that there must already, earlier in the 14th century, have been a demand for

dials to show equal hours: the Bixley dial could well be an example of this.

Although transitional mass dials *may* have appeared in the late 15th century there is no reason why they could not have appeared significantly earlier, perhaps as early as the beginning of the 14th century. Clocks which showed equal hours,[18] at least approximately, started to appear at the end of the 13th century and there would have been some pressure for sundials to have the hours numbered in the same way (i.e., with XII for noon), even if the 'hours' they indicated were not actually the same.[19] Astrolabes, too, often had a 2×12 hour timescale running round the limb. Norwich had a clock in the cathedral at least by 1291 (when it is recorded that it was being repaired) and by 1322, when a more advanced astronomical clock was being built to replace it, the earlier one was referred to as an "*antiquum horologium*".[20] Thus, when Bixley church was still newly-built, there could easily have been a desire to give it timekeeping facilities in line with those at the mother cathedral.

Mass dials with numbered hour-lines are rare in England but one example which has appeared in the *Bulletin*[21] is on a buttress of St Andrew's church, Wickhampton, just 10 miles east of Bixley. The church actually has three mass dials but the one which is of interest here (Fig. 8) is delineated around the full circle with midnight at the top and noon at the bottom, both marked by a cross. The Roman numerals, which are not all clear, have been described as being in 'secretary hand' but, with only 'X's and 'I's, the evidence is very slim and almost any medieval style would fit. The 2×12 hour marking is immediately reminiscent of the early astronomical clock dials and might suggest a link to the nearby Norwich Cathedral clock(s).

Fig. 8. The 'transitional' mass dial at St Andrew's church, Wickhampton, Norfolk. The church is built mainly of flint so the dial is on a buttress.

St Andrew's church is best-known for containing "what are among the best 14th century wall paintings in England"[22] and although this does not necessarily mean that the mass dial is also from the 14th century, it does indicate that it was an active period for developing the church.

It is perhaps not entirely coincidental that Bixley lies only a very few miles away from several other sites with medieval horological connections, including the *horologium* found near Shotesham,[23] the quadrant found in the parish of Cantley,[24] the village of Stoke Holy Cross, thought to be the home of Roger and Lawrence of Stoke, clockmakers associated with the astronomical clocks of both Norwich and St Albans, and other unpublished finds. In addition, an astrolabe was made for Norwich in the 1320s;[25] the navicula now in the National Maritime Museum was found at Sibton Abbey, just over the border in North Suffolk,[26] and several other medieval timekeeping instruments (including a simple nocturnal) have all been found within a 20-mile radius. Although these finds are not exactly dated, they are all late-medieval and show that there was a significant interest in timekeeping in south Norfolk at this time: the Bixley mass dial would easily fit in with that tradition.

ACKNOWLEGEMENTS

Thanks are due to the following who helped in the search for the Bixley dial and drawings: Caroline Rawlings (Church Development Officer, Diocese of Norwich); Fiona Sarson (Secretary, Crown Point Estate Office); Rev. Robert Parsonage (Rector, Poringland); Tony Sims (Norfolk Heraldry Society); Ms Tina Eagle (Clerk, Bixley Parish Council); Norwich Records Office; British Library. I am also grateful for inputs from Tony Wood and Frank King.

REFERENCES and NOTES

1. The term 'mass dial' might be considered inappropriate for cases where the dial attempts to show the time in hours, rather than indicating the occasions of mass. Nevertheless, the term is in such widespread use to indicate any dial of the later Middle Ages inscribed directly into the building stonework that it is used here.
2. The dial does get a brief mention in the addendum of the 4th edition of Mrs Gatty's *Book of Sun-Dials* (the Eden and Lloyd edition).
3. OS Grid reference TG 2585 0496. The BSS Mass Dial Registrar noted that Bixley does not appear in his AA Gazetteer and the dial was not recorded in the Register.
4. Translation kindly provided by Frank King and Max Drinkwater (University of Cambridge).
5. Nun Macrina (transl.): *The Vita Prima of St Wandregesilius*, Mettingham College Series No. 2 (2011). The historical foreword contains some information on his life and veneration.
6. C. Reeve: *Norwich: the Biography*, Amberley (2014). See especially pp. 47–54.
7. Francis Blomefield: *An Essay Towards a Topographical History of the County of Norfolk:* Vol. 5, pp. 447–55, 'Hundred of Henstede: Bixley' (London, 1806) quotes "in

1478, Alice Cooke of Horsted, wife of R. Cooke of Crostwheyt, by will in Regr. Castone, fo. 71, orders thus, 'Item, I wyll have a man to go a pilgrimage to St. *Wandrede* of Biskeley' ". Available online at *www.british-history.ac.uk/topographical-hist-norfolk/vol5/pp447-455* [accessed 29 June 2015].

8. *The Antiquities of the County of Norfolk*, Vol. VII, Norfolk & Norwich Archaeological Society, p. 239 (1872).
9. Anthony Norris (1711–86) was the son of a local parson and educated at Gonville and Caius College, Cambridge. His biography is in the *Dictionary of National Biography*. Most of his original manuscripts are in the Norwich Record Office as part of the Rye Collection: Rye 6, volumes 3 (p. 247) and 6 (p. 261) contain details of Bixley written in the 1730s (particularly the coats of arms in the church) but although the dedication stone is described it is not drawn there. The drawing which Blomefield copied must be elsewhere.
10. Francis Blomefield: *An Essay Towards A Topographical History of the County of Norfolk:* ref. 7 above. Blomefield (1705–52) was another Norfolk antiquary with a biography in the DNB and who was educated at Gonville and Caius College: his researches on the county are highly regarded.
11. British Library MS Add 23025, ff. 200–202 (part of the Dawson Turner Collection).
12. Caroline Rawlings is Church Development Officer (and Assistant DAC Secretary) of the Diocese of Norwich and Bishop's Furnishing Officer.
13. *www.heritage.norfolk.gov.uk* and search for Bixley church.
14. T. Wood: 'Erratic Numerals', *BSS Bull*., 25(ii), 42–43 (June 2013) mentions that the term covers "quite a few dials of 'in-between' status".
15. T.W. Cole: *Origin and Use of Church Scratch Dials*, self-published (1935). Facsimile by Pierhead Publications, Herne Bay (2001).
16. A.R. Green: *Sundials – incised dials or mass clocks*, Society for Promoting Christian Knowledge (1926). See particularly chapters 4–6.
17. J. Davis: 'Robert Stikford's "*De Umbris Versis et Extensis*"', *BSS Bull*., 23(iv), 24–28 (Dec 2011).
18. It has been argued (see H.G. Hammond: 'The foliot and the natural day', *J. Antiquarian Horological Soc.*, 12/2, 154–157 (1980)) that the earliest simple tower clocks, regulated by a foliot, were adjusted twice a day to show seasonal (unequal) hours. Whilst this is possible, there is much evidence that astronomical clocks of the period showed equal hours.
19. See for example, the inner dial of the Wells Cathedral clock (dated originally to the 1380s; image on Wikipedia) which, although a later reconstruction, shows the 2×12 hour format.
20. For the Norwich Cathedral clock, see I. Atherton, E. Fernie, C. Harper-Bill & H. Smith: *Norwich Cathedral: Church, City and Diocese, 1096–1996*, Hambledon Continuum, see pp. 441–2 (1996) and J.D. North: *God's Clockmaker – Richard of Wallingford and the invention of time*, Hambledon & London (2005). See pp.141–3 for references to Roger and Laurence of Stoke's input to clockbuilding.
21. T. Wood and Finola O'Carroll: 'A Celtic Quartet', *BSS Bull*., 20(ii), 84–87 (June 2008). The Wickhampton dial is shown as Fig. 6.
22. *www.norfolkchurches.co.uk/wickhampton/wickhampton.htm*
23. J. Davis: 'A portable horologium', *BSS Bull*., 24(i), 18–22 (March 2012).
24. J. Davis: 'A medieval Gunter's quadrant?', *BSS Bull.*, 23(iii), 2–7 (Sept 2011). See also the appendix of J. Davis: 'The Chetwode Quadrant – a medieval unequal hour instrument', *BSS Bull*., 27(ii) 2–6 (June 2015).
25. J. Davis and M. Lowne: 'An Early English Astrolabe at Gonville and Caius College, Cambridge, and Walter of Elveden's *Kalendarium*', *J. History Astronomy,* 46(3), 257–290 (August 2015). DOI: 10.1177/0021828615590336.
26. NMM, Greenwich, AST 1146.

john.davis@btinternet.com

Postcard Potpourri 34 – Deene Park, Corby, Northamptonshire

Peter Ransom

Although not quite visible without a magnifying glass, this dial has the legend ANNO DOM MDCCLXIX spread out above the gnomon. This dates it to 1769 and the dial is number 6304 in the 2010 BSS Register where its description states that it declines about 5 degrees west. However, since there are fewer afternoon hours shown on the dial I think it declines to the east rather than the west.

Deene Park dates from 1514 and has an interesting history. It is open to the public and details of the building, opening hours and admission charge can be found at *www.deenepark.com/*

The postcard is not dated but has the name Gordon Turnill, A.I.I.P. Stamford, Lincs. printed on the back. It appears that the Lincolnshire Film Archive has a vast collection of material from the years 1929–69 by this photographer.

pransom@btinternet.com

IN THE FOOTSTEPS OF THOMAS ROSS
Part 14: Aberdour Castle

DENNIS COWAN

Aberdour Castle (Fig. 1) is located on the southern coast of Fife on the northern bank of the Firth of Forth. Parts of the castle date back to the early 13th century and it was extended in the 15th, 16th and 17th centuries. It is one of the oldest datable castles still standing in Scotland. However, only the 17th-century wing is still roofed and the tower has mostly collapsed. The castle has been owned in turn by the Mortimer, Randolph and Douglas families and is now in the care of Historic Scotland. The Earls of Morton, the last owners, were part of the Douglas family.

In volume 5 of *The Castellated and Domestic Architecture of Scotland* [1] of 1892 Thomas Ross identified a vertical dial built into a niche in the corner of the castle. He said:

"This quaint dial [Fig. 2] *is placed in a kind of niche formed on a projecting corner of the castle; it cuts diagonally across the corner, and faces in a south west direction. Over one of the windows in this part of the castle are the initials of William, Earl of Morton, who built it between the years 1606 and 1648, the year of his death. Since the sketch of this dial was made, it has been pointed out that on the upper corners it contains the initials of William, Earl of Morton, and Anne, Countess of Morton, with the date beneath 1635. These are all faintly cut, and easily escape observation."*

Fig. 1. Aberdour Castle.

It can be seen from Fig. 3 that in a recent restoration, the initials mentioned by Ross have been picked out and can be easily seen today, but the date of 1635 has been lost. A gnomon, missing in Ross's day, has been added. Despite Ross's note that the dial faces in a south west direction, today it faces due south.

However, this is not the only sundial at this location, although it was the only one in 1892. Ross did record a horizontal dial at Aberdour House, also known as "The

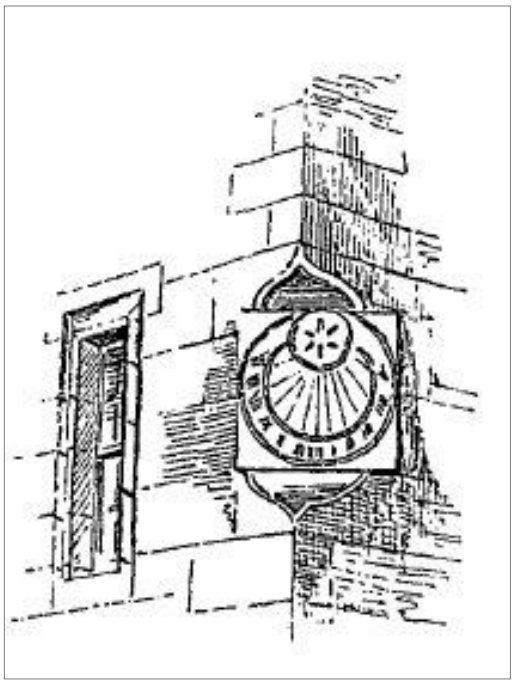


Fig. 2. Ross's sketch of the vertical dial.

Fig. 3. The vertical dial today.

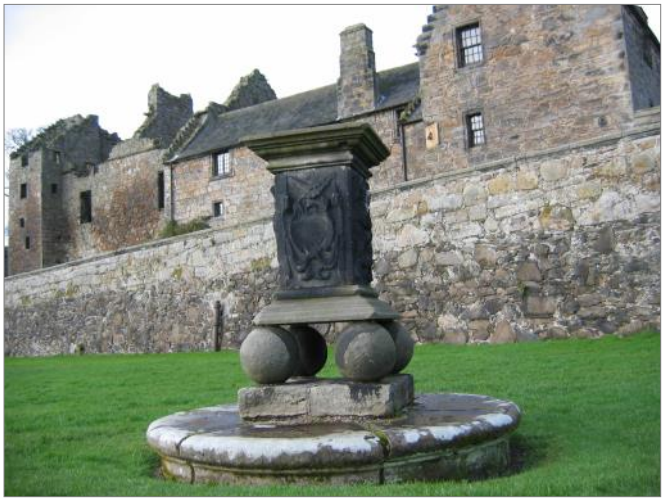


Fig. 4. The horizontal dial showing the vertical dial in the background.

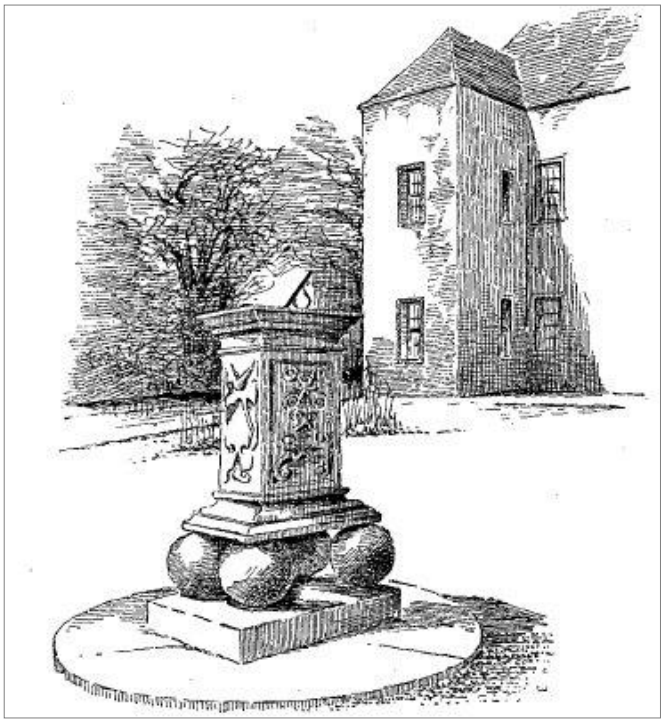


Fig. 5. Ross's sketch of the horizontal dial.

Place" next door to the castle, and this dial is now in the castle's garden (Fig. 4). Ross said:

"This quaint dial [Fig. 5]*, drawn from a sketch by Mr. John D. Michie, artist, stands in the gardens of "The Place" of Aberdour. It belongs to the second class of horizontal dials. Its square ornamented pedestal, resting on four large balls, is similar in idea to the pedestal of the dial at Pitreavie, about four miles distant, and both rest on a raised pavement, which is of a circular form here, and octagonal at Pitreavie. From information supplied by Mr. Patrick Borrowman, it appears that on the north-west face of the pedestal there is a coronet with the insignia of the Order of the Garter, and the motto HONI SOIT QUI MAL Y PENSE, and on the south-west face the Douglas heart. The south-east face contains what appears to be a clam-shell, and the north-east face a grotesque and undecipherable sculpture. The dial is set north-east and south-west, so that twelve o'clock falls exactly at the north-east corner of the stone. The letters are on the edge of the stone, and a circle contains the degrees numbered on it within."*

Fig. 6. Detail of the horizontal dial showing the remains of the gnomon and the numerals going all the way around the dial.

Ross's comment that this dial belongs to the second class of horizontal dials merely reflects the fact that the dial is carved directly on to the stone table of the pedestal, rather than having a metal dial placed on it.

This stone dial has unfortunately lost its second replacement gnomon in recent years through vandalism (Fig. 6), but it is correctly orientated. Unusually, the Roman numerals go completely around the 24-hour clock.

The dial mentioned by Ross as being at Pitreavie is now at Inveresk Garden in East Lothian and will be included in a future article. Interestingly, there is another dial with a similar pedestal only about one mile away at St Colme House, also on a raised pavement, this time of square form. Three similar pedestals within a few miles – could all three pedestals be the work of the same mason?

There is yet another dial at Aberdour Castle, this time in the centre of the walled garden. It was originally at Castle Wigg, now a ruin, north of Whithorn in the very south west of Scotland and was moved here in the 1970s.

Ross obviously did not visit this location himself, as he says:

"We are indebted to Mr. Galloway[2] for a sketch of this fine sundial [Fig. 7]*. It is of square, massive construction, 8 feet 5 inches high, and has four dial faces, each about 16 inches square (on one of which there is a table from which the difference between Greenwich and local time may be calculated). On the top ball there is a central line divided to indicate time by the shadow travelling round the ball itself, a divided circle with a gnomon at top, and another on one side at bottom."*

There are a couple of errors with this description and sketch, as no mention is made of the four reclining dials

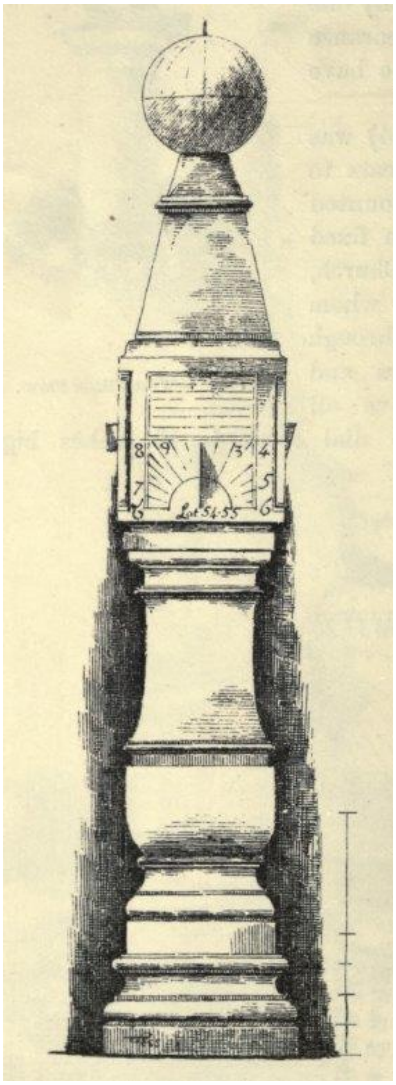


Fig. 7. Sketch of the multi-faceted dial.

Fig. 8. The multi-faceted dial showing the reclining faces.

(Fig. 8) that sit above the main cube and they are not shown on Mr Galloway's sketch. They do appear to be contemporary with the rest of the dial. Also his sketch shows Lat 54/55 on the north face of the cube whereas it is actually 54/45 (Fig. 9), the correct latitude for Castle Wigg.

There has been considerable damage to the south reclining face, which was poorly restored in the 1970s, and this is likely to be when the gnomons on the dial were replaced. Many of these copper gnomons aren't seated properly against the dial face but have a slight gap, and many are wrongly positioned.

I was originally confused, however, regarding the table on the north face which can be seen in Fig. 9, and Ross's (or Galloway's) statement that its purpose was to calculate the difference between Greenwich and local time, as I couldn't make any sense of it. (Castle Wigg is around 20 minutes behind Greenwich Mean Time.) However, if you accept that "Greenwich time" in this instance meant Local Mean Time and "local time" meant Local Solar Time then it makes sense that this is an Equation of Time table.

That indeed is what it looks like, but the figures on it did not immediately make sense. I would have normally expected that the first column would have been dates of the

Fig. 9. The north face of the multi-faceted dial showing the latitude and the non-intuitive EoT table.

Fig. 10. Part of the EoT table for four dates in October (1, 7, 15 and 29). 'Oct' is written running upwards on the left of the block of eight numbers and the 'SC' which follows 'Oct' stands for 'Slower Clock'.

month whilst the second column would be the minutes fast or slow. This obviously wasn't the case, as the figures appear to be all over the place.

But thanks to some expert advice, it does make sense, but not in an intuitive way.

For each month (see Fig. 10 where October is taken as an example) there are eight numbers arranged in four rows. The first and third rows are dates of the month and the second and fourth rows are the corresponding EoT values. These are appropriate for the first half of the 18th century using the Julian calendar, which was replaced by the Gregorian calendar in 1752.

The fact that the table uses the Julian calendar ties in nicely with the dial's probable early 18th-century date. Aberdour Castle is well worth a visit and is open every day, but closed on a Thursday and Friday during the winter months.

ACKNOWLEDGEMENTS

I acknowledge gratefully the expert advice from Frank King and John Davis, particularly regarding the definition of Greenwich and local time as described by Galloway, and the interpretation of the EoT table on the north face of the multi-faceted dial.

REFERENCES and NOTES

1. D. MacGibbon and T. Ross: *The Castellated and Domestic Architecture of Scotland,* David Douglas, Edinburgh (1892)
2. William Galloway was an architect practising in Whithorn, which is only a few miles from Castle Wigg. He provided plans for ten of the castles and churches, including Castle Wigg, that MacGibbon and Ross described in *The Castellated and Domestic Architecture of Scotland* and *The Ecclesiastical Architecture of Scotland* (published by David Douglas in 1896). He was born in 1832 or 1833 and died on 11 September 1897.

dennis.cowan@btinternet.com

A LOCAL GARDEN CENTRE SUNDIAL

MIKE COWHAM

The dial shown was seen in a local garden centre (near Melbourn in Cambridgeshire). At first glance it seems to be a rather fine and heavy slate dial with a good size dial plate. However, it is strange in that noon is set at about 1:40 pm! Also, as is fairly common with such dials, there is no gnomon gap, with all of the hour lines radiating from the centre of the star. I did not get to measure its gnomon angle. Its hour calibrations seem to all be equal, about 15° each, so these are totally wrong! Then I wonder why the word SUNDIAL appears along the four edges. Surely these should read NORTH, SOUTH, EAST and WEST? Perhaps there really is a part of Europe, or other place, where the local noon is 1 hour 40 minutes early, but it is not much use to us here in Cambridgeshire!

mike@brownsover.orangehome.co.uk

WHAT HAPPENED TO THE CALVERLEY SUNDIAL?

DEREK HUMPHRIES

During a November afternoon in 2015, I was in Tunbridge Wells making my way to record a fine armillary dial adjacent to the local police station. My progress was thwarted owing to the fact that the dial was situated within a parking precinct on private municipal land. Permission was not, in the immediate sense, granted for me to fulfil my objective; however, that's another story.

My stroll towards the police station precinct caused me to take a short-cut through Calverley Grounds, a pleasure ground adjacent to Calverley Park. My route took me past a sunken Italianate garden (Fig. 1) and in the middle of the lawn area was an unfurnished stone pedestal.

Fig. 1. Calverley Grounds as seen today (courtesy of Roy Moore, Kent Photo Archive).

On closer inspection, the top of the pedestal showed signs that something had once upon a time graced this neglected structure (Fig. 2). Had a statuette adorned this feature, or had there been a sundial here?

The next day, I scoured the Internet and came across a blog[1] entitled 'A Life in a Suitcase' with a subtitle 'Park Life' and a photograph with a sundial (Fig. 3). The author of this blog wrote:

"*My mother-in-law lived in and around Tunbridge Wells all her life. When she passed away, we discovered a small suitcase full of memories. It seemed only right to share some of them… Sadly, like many of the photos in the suitcase, I don't know who is pictured here or when it was taken. However, the setting does look very much like Calverley Grounds in Tunbridge Wells, Kent. This area of the town has quite a history attached to it. Calverley Grounds originally belonged to Mount Pleasant House, where the future Queen Victoria regularly stayed between 1826–34.*

"In 1825 the land was purchased by a property developer. His architect, Decimus Burton, went on to create a new town which was designed to rival the nearby Pantiles. In 1837 the house was converted into The Calverley Hotel (now Hotel du Vin) but the meadows were preserved as an informal open space.

Fig. 2. Top of the existing pedestal with missing décor.

Fig. 3. Children posing by the original intact sundial – circa 1950s (courtesy of Rachel Knight, author of the blog).

"Tunbridge Wells Borough Council purchased the land in 1920 and added a bandstand, sports facilities and created the formal gardens we know today.

"A sundial was installed in the rose garden in 1924 and I assume it is the one pictured here. I like the fact that the children are so smartly dressed and imagine a photo opportunity was quite a rarity."

The first thing that struck me was the difference between the pedestals in the photograph with the children and the contemporary one seen today. Was this old photograph taken in Calverley Grounds after all?

However, close inspection of the old and contemporary photographs (Figs 1 and 3) negates any doubts:

- The sun's shadow and the orientation of the gnomon in the picture with the children indicate that the photographer was facing in a northwesterly direction.
- The dry-stone walling appears in both photographs.
- The octagonal plinth on which the young girl is sitting is consistent with what is on the ground today.
- The large (somewhat blurry) building in the background of the old black and white photograph is the old Calverley Hotel (now Hotel du Vin).

A further scour of the Internet found a used postcard postmarked and dated April 1962 (Fig. 4). Here the enclosure is laid out as a rose garden with the octagonal plinth still in place, but with the upper part of the original pedestal broken and the sundial missing. So how did the pedestal happen to be broken and what became of the sundial? Even the somewhat sedate community of Tunbridge Wells is not entirely free from vandalism, so this might have been its fate? Was there an interlude when the original 1924 sundial was resurrected upon the secondary pedestal and then disappeared for good? Perhaps one of our readers knows the answer?

Fig. 4. Postcard showing broken pedestal and missing sundial – circa 1960s (E.A. Sweetman & Son Ltd Tunbridge Wells). Right: close-up of the pedestal.

REFERENCE

1. 'A Life in a Suitcase' blog *http://alifeinasuitcasetw.blogspot.co.uk/2013/02/park-life.html*

Derek Humphries lives in Kent and has been a BSS member since October 2015. Derek is a retired cartographer and IT consultant. As a hobby, he loves to combine his love for maps with IT technology by creating online historical distribution maps from data available on the Internet. Derek can be contacted at: *derek29cr@hotmail.com*

Equatorial Sundial in India

Many readers will be familiar with the large masonry sundials built in India by Sawai Jai Singh in the 18th century. This photograph, taken by Philip Earis who is temporarily resident in India, shows a variant built from concrete and steel in the 1980s. It is on the campus of the University at Pune. Careful calculation suggests that the shadow of the curious semi-cylindrical feature does not cause problems at low solar declinations!

Frank King

NEW DIALS (2)

Armillary Sphere in South Wales

In May 2015 I was approached by a company called Schaeffler who were interested in a 1 metre diameter stainless steel armillary sphere for their South Wales production plant. Apparently 60% of drive-train components in every new car manufactured are made by Schaeffler. The South Wales plant makes tappets (I didn't realise cars still used tappets) and Schaeffler are celebrating their 50th year in the UK.

I told the executive who phoned me that it would take approximately twelve weeks to make a large dial such as this so he would need to place the order in mid-June if he wanted delivery by mid-September, in time for the big day. I then heard nothing from them until the end of July when negotiations began. I didn't start work until the beginning of August and what followed felt like a spell of hard labour in a gulag, involving ten-hour days, six days a week.

The finished article, 1.3 metres in diameter, weighed a whopping 200 kg and needed four men to lift it.

The hour ring was engraved in the traditional manner but the rest of the etching was done with a laser. I thought the two styles would create an interesting contrast; the laser etching, I felt, would suit the 'corporate' nature of the piece. Most of the rings were mirror polished but the hour ring was left with a grain going from east to west – a feature on all my armillaries, to facilitate the reading of the shadow. I had the meridian ring aluminium-oxide blasted; this is the same as sand blasting but infinitely finer, again to create an attractive contrast. Prior to manufacture, I employed a company in India who created a lifelike CGI image of the armillary from the information and sketches I sent them. They worked quickly (most of it over a weekend) and didn't complain about the number of alterations and corrections I insisted on. I would recommend their services to any sundial maker embarking on a large project.

Schaeffler installed a block of Welsh granite 2×1 metres in front of the plant for it to sit on and my wife and I drove up to the site on a grey and wet overcast Friday morning. Anyone who has ever fitted a sundial will know that it is usually cloudy or wet on the chosen day so I organised a full set of printed instructions along with a suitable drill bit and some resin. Miraculously, the sun came out at twelve and stayed out till just past one so we managed to get it fully installed, with some help from the Schaeffler employees.

Brad Dillon *brad.dillon48@yahoo.co.uk*

HOLIDAY SUNDIAL SIGHTINGS

DAVID PAYNE

Fig. 1. David and the sundial. Photo: Richard Gambling.

Fig. 2. Latitude and longitude on the gnomon.

Last summer I visited the Isles of Scilly, Cornwall. On a day boat trip to the island of St Agnes, I discovered a horizontal sundial (Fig. 1) on the small island of Gugh, which is connected to St Agnes by a sandbar.

Our guide told us it appeared about seven years ago. He did not know who built it, but thought it was built by holidaymakers staying on the island.

Its latitude and longitude are marked on its wooden gnomon (Fig. 2).

If any reader knows who built this sundial, Amanda Martin, curator of the Isles of Scilly Museum, would like to know. She can be contacted by email at *info@losmuseum.org*.

david.payne1942@btinternet.com

TRUSTEES' ANNUAL REPORT 2015–16

The Society's *raison d'être* is 'the advancement of the education of the public in the science and art of gnomonics'. As in previous years this has been prosecuted on a broad front:

- *Bulletin*: long the Society's flagship, continues as a high-quality publication;
- website: increasingly the Society's point of access by the public, its content has been enhanced;
- Help and Advice: accessed via the website, the service has been a great success and increasingly popular with the public;
- meetings: the annual conference (held at Nottingham in 2015) and the Newbury meeting together presented high-quality programmes;
- schools outreach: well received, with further events held for schools in Oxford;
- talks, dial walks, making and restoring public dials: delivered to the public by individual members at a local level;
- dial recording: by individual members, the Society's Registers are the national record of dials;
- publications: in addition to the *Bulletin*, an update of the fixed dial register and No. 11 in the monograph series have been produced;
- Library: a generous donation of books by John Lester and another important book donated by Chris Daniel have further enhanced the collection.

There can be no doubt that the Society provides significant ongoing public benefit, has created an enormous contribution to dialling knowledge, and is recognised as *the* U.K. sundial authority.

The Society's extensive and varied activities are entirely undertaken by volunteers, not only in terms of visible output, but also the often hidden support and back-office elements. Without our volunteers there would be no Society! Thanks are due to all who make the Society what it is – authors, recorders, specialists, trustees, and those who help on an *ad hoc* basis.

A bulge in the membership's age structure has, in recent years, precipitated the progressive retirement of a cadre of stalwart volunteers on whom the Society has long relied. Although, to the appreciation of all members, new blood has come forward, of itself it is not yet sufficient to plug the gap. Discerning readers of the Newsletter will have noted that during the last year we have had to cox and box to 'keep the show on the road'. The day has been saved by

a few shouldering yet greater burdens and the return of some old hands.

Whilst the trend in new joiners is broadly flat, a further consequence of the age bulge is that our membership is declining. This in turn impacts revenue. In 2015 the Society's operations resulted in a small deficit. However, the balance sheet is very strong and can support the Society's activities for the foreseeable future.

More detailed information is annexed below. If you feel able to help in any way or have ideas we would love to hear from you.

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

ANNEXE

The *Bulletin*

In formal terms John Davis continues as Editor, and it is he who generally makes the initial comments on each article that is received. Over the last year a team of four has produced the *Bulletin*. Editing and layout has been undertaken by Christine Northeast with, at times, significant technical input from Frank King, who advises on gnomonic issues. Bill Visick has typeset the front and back covers (inside and outside) and negotiated with the printers. Fiona Vincent has proof-read every page of every issue.

In addition, Mike Shaw, John Lester and Mike Cowham have nobly taken some challenging articles and put them into shape.

Unfortunately, both Christine and Frank have suffered significant health problems recently and both are having to wind down. The good news is that David and Jen Brown have agreed to become the new Frank and Christine. The latter hope to be able to stay around long enough to ensure a smooth handover.

There will be an opportunity at the Liverpool conference to discuss the way forward and the further help that would be welcome.

The Bulletin Team

Website

Members will be aware that the website has recently suffered from periods of unavailability due to problems at our hosting company. We are taking action to resolve these issues and more details will be provided at the Liverpool conference. This is particularly frustrating because the website is an invaluable resource for members and non-members alike, in the latter case acting as a shop-window to attract more members. Ideally we should keep a high level of news and interesting content to attract visitors. We already have a wealth of information on the web (How Sundials Work, Bridol, selected *Bulletin* articles) with more to come (Biography of Makers, Mass Dials).

There is more that could be done: the webmaster would welcome assistance with both web and content. Again there will be more opportunity to discuss this at Liverpool.

Bill Visick

Help and Advice

Enquiries have been received relating to all aspects of sundials – new, old, vertical, horizontal, restorations, archaeological fragments, projects, educational, society talks, values, makers, theory and so on – from individuals around the globe. Some *Bulletin* articles have been and will be spawned from these, and a few new members gained. This is clearly a valuable public service; it is handsomely supported by several members who have been called on for their knowledge and expertise, and whose unstinting help is much appreciated.

David Brown and Frank King

Conference

Organisation has transitioned to a team approach – to which the range of different tasks is ideally suited. The current team comprises Doug Bateman, Mike Shaw, Bill Visick, Liz and Chris Williams. As well as delivering Liverpool, an Oxford venue has been booked for 2017. Anyone wishing to help, especially in finding a 2018 venue, would be much appreciated.

The Conference Team

Schools Outreach

This has been positively received but takes considerable effort – preparation and delivery. Volunteers are needed to help spread the load. During the year David & Jen Brown and Chris & Liz Williams twice visited Cheney School Oxford to participate in day-long sessions that were also open to other local schools.

The Schools Team

Registrar

2015 saw the publication of the sixth edition of the Fixed Dial Register. As in 2010 we issued a DVD version covering all the dials in the Register together with photographs and reports where available; and also an Abridged printed version, a small A5 volume listing every dial but with only a brief description and no illustrations. In place of the Full printed volumes of former editions, which would have run to three thick A4 books, we printed a range of smaller booklets, each covering a County or a group of small counties. Very little County stock remains as well as some of the DVD and Abridged versions.

Reports of new dials, and of old dials never before recorded, continue to come in and are extremely welcome.

John Foad

Mass Dials

During the year the Mass Dial reports were transferred to secure archives in York at the Borthwick Institute.

I have handed over acknowledgement of mass dial correspondence to Ian Butson but am still available as 'long stop' for questions and queries. There is still a small trickle of e-mails and letters from Church Recorders of NADFAS; they have standing instructions to contact us if they find a sundial or mass dial and we are most grateful for their help over the years.

About 30 counties have been published as booklets but the big ones of Norfolk, Suffolk and Wiltshire remain to be completed by another hand.

I was invited to the Salisbury Diocesan Conference in Wilton to give a talk on mass dials for the benefit of the architects and surveyors assembled there. This was given with the help of Ian Butson and was well received.

The year also saw the publication of Monograph No. 11 *Somerset Scratch Dials: the original photographs of Dom Ethelbert Horne*. Again, I must record my thanks to those who helped in its production in time for the 100th Anniversary of Horne's book which described these dials.

Many thanks to colleagues for their help over the years, especially Ian Butson, John Foad and Jill Wilson.

Tony Wood

Library

The Library is in excellent hands at the Bromley House Library, of which I have been a member for many years. One of its librarians takes an interest in our library and is a great help to me. The Bromley House Library, with the help of volunteers, is gradually digitising all books in Bromley House, including ours. To access the catalogue, go to *www.bromleyhouse.org* and click on the 'Library Catalogue' button. Putting 'sundials' into the search box gives access to most of the BSS collection.

With continuing acquisitions there is a potential lack of space in the Thornton Room where the BSS Library is kept. Most volumes are on shelves, with rare and valuable items in a locked cupboard. We have almost filled our allocated shelves.

John Wilson

Biographical

In an earlier report I said there must be many more makers out there. Some would be local, known only to local historians, some known only from a single signed dial or from a sale offer or a guidebook or some other listing. As expected, new names have appeared from a variety of sources.

The number of names in the *Biographical Index* now exceeds 5000. My thanks to those many members who have ensured that I have the information they have discovered – from 'Flickr' to eBay, from their wanderings and readings and so on. And of course the Registrar ensures I receive makers' names from reports he receives.

Jill Wilson

Sundial Design Competition

The Design Award Scheme for 2010–15 has produced some very good designs, with a total of 13 entries, all showing ranges of skill and imagination. One of these is a professional restoration and the remainder are all commissions. The website method of taking entries has worked well and members are encouraged to submit their comments and opinions about the dials. The more input the better! The result will be announced at the Liverpool conference.

The Design Competition Team

Photographic Competition

Several entries have already been received. The closing date for entries is 8 April 2016. Entries will be exhibited and the result announced at the Liverpool conference.

Ian Butson

Sales

The last twelve months have seen a slowing down of sales, in part because we had no new titles to offer and also because members seem to have personal copies of nearly everything we hold in stock.

However, we now have a new monograph, No. 11 by Tony Wood, and this will be available at the Liverpool conference. I have also asked Anthony Turner, of Rogers Turner Books, whether he would send me a list of his specialist dialling books that can be circulated to members at the conference.

Elspeth Hill

Membership

We now have 344 members: 249 are based in the UK, the majority of the rest in North America. We are losing members because of an ageing membership. We need to attract more younger new members, possibly the newly retired.

Jackie Jones

Secretary

This has been the Society's first full year as a Charitable Incorporated Organisation (CIO). The transition has been fully and successfully implemented. This puts the Society's legal status and governance on a secure and best-practice footing.

Chris Williams

Treasurer

The Society's 2015 Accounts begin overleaf.

While it has been possible to use PayPal for some while, the system has been free standing and not particularly visible. Thanks to Bill Visick's rebuilding of the website, it is now a more convenient option for those who like online transactions. For those who do not, I can assure you that traditional means will remain both acceptable and welcome.

Graham Stapleton

BSS ACCOUNTS FOR THE YEAR

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 YEAR	1st January 2015
END OF FINANCIAL YEAR	31st December 2015

TRUSTEES AT 31ST DECEMBER 2015

Dr F King - Chairman
C Williams - Secretary
J Jones - Membership Secretary
G Stapleton - Treasurer
B Visick - Webmaster
C Lusby Taylor
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

ENDED 31ST DECEMBER 2015

INDEPENDENT EXAMINER'S REPORT ON THE ACCOUNTS

Report to the trustees/members of The British Sundial Society on the accounts for the year ended 31st December 2015 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: 16th February 2016.

THE BRITISH SUNDIAL SOCIETY
(CHARITABLE INCORPORATED ORGANISATION)

STATEMENT OF FINANCIAL ACTIVITIES
FOR THE YEAR ENDED 31ST DECEMBER 2015

	Notes	Unrestricted Funds £	Restricted Funds £	Total 12 months 2015 £	Total 11 months 2014
INCOME					
Donations and legacies	**3a**	376	0	376	0
Investments	**3b**	263	0	263	146
Charitable activities	**3c**	29,798	0	29,798	2,502
TOTAL INCOME		**30,437**	**0**	**30,437**	**2,648**
EXPENDITURE					
Charitable Activities	**4a**	30,375	0	30,375	5,095
Other	**4b**	4,504	0	4,504	850
TOTAL EXPENDITURE		**34,879**	**0**	**34,879**	**5,945**
NET INCOMING/ (OUTGOING) RESOURCES		**(4,442)**	**0**	**(4,442)**	**(3,297)**
Total Funds Brought Forward		75,334	8,963	84,297	87,594
TOTAL FUNDS CARRIED FORWARD		**70,892**	**8,963**	**79,855**	**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 40 to 44 form part of these financial statements.

THE BRITISH SUNDIAL SOCIETY
(CHARITABLE INCORPORATED ORGANISATION)

BALANCE SHEET
AS AT 31ST DECEMBER 2015

	Notes	Unrestricted Funds £	Restricted Funds £	31-Dec-15 Total £	31-Dec-14 Total £
Fixed Assets					
Tangible assets	2	17,228	0	17,228	17,228
Current Assets					
Debtors	8	0	0	0	0
Cash at bank and in hand	7	63,245	8,963	72,208	67,660
Total Current Assets		**63,245**	**8,963**	**72,208**	**67,660**
Creditors: amounts falling due within one year	9	9,581	0	9,581	591
NET CURRENT ASSETS		53,664	8,963	62,627	67,069
NET ASSETS		**70,892**	**8,963**	**79,855**	**84,297**
Funds of the Charity					
General Funds		70,892	0	70,892	75,334
Restricted Funds	6	0	8,963	8,963	8,963
Total Funds		**70,892**	**8,963**	**79,855**	**84,297**

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 5-2-2016 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 YEAR ENDED 31ST DECEMBER 2015

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 YEAR ENDED 31ST DECEMBER 2015

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. The financial statements have been prepared in accordance with Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standard for Smaller Entities (FRSSE) published on 16th July 2014 and effective January 2015.

2. TANGIBLE FIXED ASSETS

		Unrestricted Funds £	Restricted Funds £	Total £
Library				
Opening	31-Dec-14	17,228	0	17,228
Revaluation		0	0	0
Cost at	31-Dec-15	17,228	0	17,228
Depreciation	31-Dec-14	0	0	0
Charge		0	0	0
Depreciation at	31-Dec-15	0	0	0
Net Book Value	31-Dec-15	**17,228**	**0**	**17,228**
Net Book Value	31-Dec-14	17,228	0	17,228

The British Sundial Society (CIO) had the Library revalued by Rogers Turner Books for its opening 2014 accounts. The replacement cost valuation was £17,228.

THE BRITISH SUNDIAL SOCIETY
(CHARITABLE INCORPORATED ORGANISATION)

NOTES TO THE FINANCIAL STATEMENTS (continued)
FOR THE YEAR ENDED 31ST DECEMBER 2015

	Notes	Unrestricted Funds £	Restricted Funds £	Total 12 months 2015 £	Total 11 months 2014 £
3. INCOME					
a) Donations and legacies					
Donations and Gift Aid		376		376	0
		376	**0**	**376**	**0**
b) Investments					
Interest		263		263	146
		263	**0**	**263**	**146**
c) Charitable Activities					
Subscriptions		11,798		11,798	1,633
Events	5	16,572		16,572	350
Sales		1,428		1,428	519
		29,798	**0**	**29,798**	**2,502**

	Notes	Unrestricted Funds £	Restricted Funds £	Total 12 months 2015 £	Total 11 months 2014 £
4. EXPENDITURE					
a) Charitable Activities					
Bulletin		9,419		9,419	3,778
Celebrations		368		368	0
Education		503		503	210
Events	5	17,592		17,592	37
Independent Examiners Fees		525		525	591
Professional Fees		35		35	85
Publications		959		959	0
Sales		206		206	53
Travel		768		768	341
		30,375	**0**	**30,375**	**5,095**
b) Other					
Administration		1,498		1,498	648
Banking / Insurance		1,342		1,342	176
Library		179		179	19
Miscellaneous		248		248	7
Storage		1,237		1,237	0
		4,504	**0**	**4,504**	**850**

THE BRITISH SUNDIAL SOCIETY
(CHARITABLE INCORPORATED ORGANISATION)

NOTES TO THE FINANCIAL STATEMENTS (continued)
FOR THE YEAR ENDED 31ST DECEMBER 2015

5. EVENTS

	Balance 31-Dec-14 £	Income £	Expenditure £	Balance 31-Dec-15 £
Greenwich Conference (2014)	4,717			4,717
Nottingham Conference (2015)	0	16,237	17,328	-1,091
Safari	200			200
Day Meetings	542	335	264	613
		16,572	**17,592**	

6. RESTRICTED FUNDS

	Balance 31-Dec-14 £	Income £	Expenditure £	Balance 31-Dec-15 £
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-15 £**	**Total 31-Dec-14 £**
Current Account	15,919		15,919	5,828
Charities Office Investment Fund	47,326	8,963	56,289	61,832
	63,245	**8,963**	**72,208**	**67,660**

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-15 £**	**Total 31-Dec-14 £**
Independent Examiners Fees	525		525	591
Liverpool Conference (2016)	9,056		9,056	0
	9,581	**0**	**9,581**	**591**

10. TRUSTEES AND OTHER RELATED PARTIES

No 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).

HONORARY OFFICIALS OF THE BRITISH SUNDIAL SOCIETY

Patron: The Hon. Sir Mark Lennox-Boyd
President: Christopher St J H Daniel MBE
Vice-Presidents: Mr David A Young & Mr Frederick W Sawyer III

TRUSTEES

Dr Frank King (Chairman)
12 Victoria St
CAMBRIDGE
CB1 1JP
Tel: 07766 756997
chairman@sundialsoc.org.uk

Mr Bill Visick (Webmaster)
Kites Nest Cottage
Kites Nest Lane
BOURTON
Dorset, SP8 5AZ
Tel: 07901 954568
webmaster@sundialsoc.org.uk

Ms Jackie Jones (Membership Secretary)
51 Upper Lewes Rd
BRIGHTON
East Sussex, BN2 3FH
Tel: 01273 673511
membership@sundialsoc.org.uk

Mr David Brown (Help and Advice Coordinator)
Gibbs Orchard, Sutton Rd
SOMERTON
Somerset, TA11 6QP
Tel: 01458 274841
HelpAndAdvice@sundialsoc.org.uk

Mr Chris H K Williams (Secretary)
c/o The Royal Astronomical Society
Burlington House
London W1J 0BQ
Tel: 01233 712550
secretary@sundialsoc.org.uk

Mr Graham Stapleton (Treasurer)
50 Woodberry Avenue
NORTH HARROW
Middlesex, HA2 6AX
Tel: 020 8863 3281
treasurer@sundialsoc.org.uk

Mr Chris Lusby Taylor
32 Turnpike Rd
NEWBURY
Berks., RG14 2NB
Tel: 01635 33270
clusbytaylor@gmail.com

OTHER SPECIALISTS

Dr John Davis (Editor)
Orchard View
Tye Lane
FLOWTON
Suffolk, IP8 4LD
Tel: 01473 658646
editor@sundialsoc.org.uk

Mr John Foad (Registrar)
Greenfields
Crumps Lane
ULCOMBE
Kent, ME17 1EX
Tel: 01622 858853
registrar@sundialsoc.org.uk

Miss R (Jill) Wilson (Biographical Projects)
Hart Croft
14 Pear Tree Close
CHIPPING CAMPDEN
Gloucs., GL55 6DB
Tel: 01386 841007
biographical@sundialsoc.org.uk

Mr John Wilson (Librarian)
38 Stuart Close
ARNOLD
Notts., NG5 8AE
Tel: 0115 926 6175
librarian@sundialsoc.org.uk

2016 Conference Team
conference@sundialsoc.org.uk

Mass Dials
MassDials@sundialsoc.org.uk

Mr Peter Ransom (Education)
29 Rufus Close
Rownhams
SOUTHAMPTON
Hampshire, SO16 8LR
Tel: 023 8073 0547
education@sundialsoc.org.uk

Mr J Mike Shaw (Newsletter Editor)
3 Millwood
Higher Bebington
WIRRAL, CH63 8RQ
Tel: 0151 608 8610
newsletter@sundialsoc.org.uk

Mrs Elspeth Hill (Sales)
4 The Village
StonegateTr
Nr WADHURST
East Sussex, TN5 7EN
Tel: 01580 201720
sales@sundialsoc.org.uk

Mr David Pawley (Newbury Meeting Organiser)
8 Rosemary Terrace
Enborne Place
NEWBURY
Berks., RG14 6BB
Tel: 01635 33519
newbury@sundialsoc.org.uk

Mr Ian R Butson (Photographic Competition)
60 Churnwood Rd
Parsons Heath
COLCHESTER
Essex, CO4 3EY
Tel: 01206 860724
photos@sundialsoc.org.uk

The British Sundial Society
c/o The Royal Astronomical Society
Burlington House, Piccadilly
London, W1J 0BQ

The Society's website is at www.sundialsoc.org.uk
The British Sundial Society is Registered Charity No. 1155688

ITA VITA.
6
7
8
9
10
11
12
1
2
3
4
5