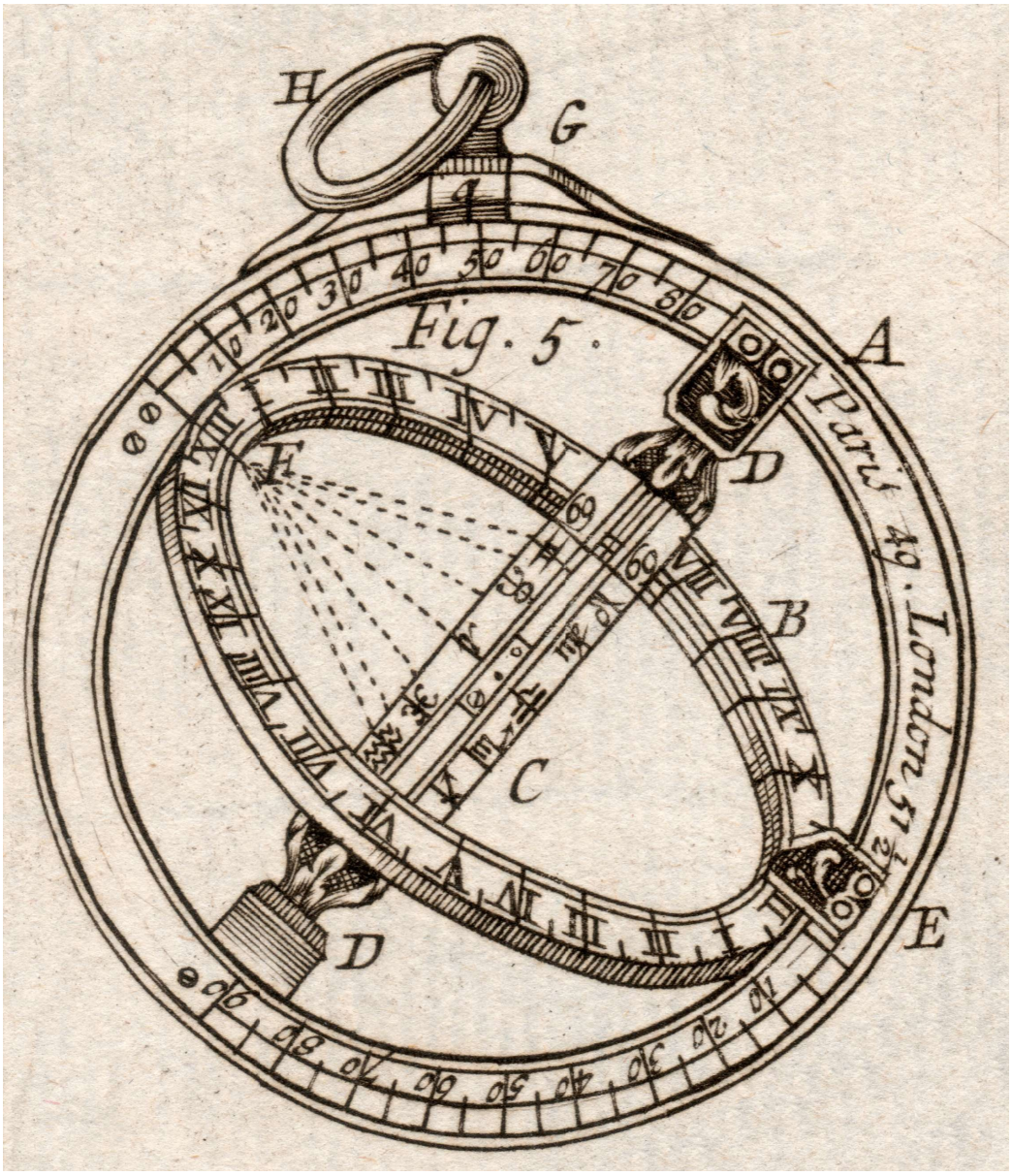
BSS Bulletin 28(ii)

The British Sundial Society

BULLETIN

VOLUME 28(ii)
June 2016

June 2016



The Construction and Principal Uses of Mathematical Instruments *by M. Bion in the 1758 translation by Edmund Stone includes this illustration in the section on 'The construction and use of the universal equinoctial ring-dial'.*

The hanging support is set at 49°, the latitude of Paris. The dotted lines show how the date scale is constructed across the central bridge. Along the lower edge is a further latitude scale for use in the Southern Hemisphere.

In use, the main support is set to the user's latitude and the gnomon hole in the bridge is set to the correct date. The dial is then turned until the spot of light from the gnomon falls on the inner edge of the hour ring, thereby showing the time. It is necessary to know whether it is morning or afternoon before taking the reading.

Mike Cowham

***Front cover**: This dial, probably commissioned by William Hughes of Bryngola, Anglesey, is described by John Davis in his article (pages 2–6) as having "almost everything you could wish for in terms of furniture". Photo: John Davis.*

***Back cover**: This dial by Henry Gyles of York (1645–1709) is not dated but records indicate that it was made in 1693. The design declination is about 5° E and it is believed to have been originally in Brighton, but now it is installed on the first floor of Grays Court in York and faces about 45° E. SRN 2947. Photo: Maureen Harmer.*

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

Printed by The Lavenham Press Ltd, Lavenham
01787 247436

BULLETIN
OF THE BRITISH SUNDIAL SOCIETY

ISSN 0958-4315

VOLUME 28(ii) - June 2016

CONTENTS

EDITORIAL

This June issue of the *Bulletin* is the first since the Liverpool Conference. It includes accounts not only of the talks but also of the BSS Sundial Awards and Photographic Competition.

The 'Most Enjoyed Article 2015' was Christine Northeast's 'The Moving Sundial of Ardrossan' which appeared in the March issue of the *Bulletin*. The votes were counted by Frank King, and John Davis acted as scrutineer. Joint second were Ian Butson's 'A Little-Known Cambridge Sundial… and the Story of its Restoration' and Dennis Cowan's 'In the Footsteps of Thomas Ross'. An honorable mention should go to Allan Mills for his article on Dialling Instruments in Holbein's Painting 'The Ambassadors'.

We include the usual wide range of articles on dialling and, for the first time for a while, we have a crossword puzzle. This was compiled by John Lester and should prove a delightful challenge to crossword enthusiasts. The names of all those who submit correct solutions will be printed in the next issue of the *Bulletin*. Solutions must be submitted by 5 August 2016 to *editor@sundialsoc.org.uk*

The Editorial Team is always looking for articles and, with the holiday season approaching, we are hoping that you will all be eagerly on the lookout for interesting sundials to write about. If you have historical interests or enjoy amateur detective work then you may be surprised at the story that can lie behind even seemingly ordinary sundials. See what you can find out and share your knowledge with our readership. It goes without saying that reports of new sundials or proposed sundial projects are a potentially rich source of copy too.

Frank King

A MYSTERY WELSH HORIZONTAL DIAL

JOHN DAVIS

This article is based on a presentation made at the 2012 BSS Newbury meeting.

This sundial (Figs 1, 2 and 3) has almost everything you could wish for in terms of furniture. Despite being only 252 mm (nominally 10″) in diameter it has a complex compass rose, an EoT scale which includes the zodiac calendar, a timescale delineated to 1-minute by means of transversals, a set of geographical locations, a coat of arms and a name. Since it went through a number of auction houses in London its provenance is lost, but as it is dated (1775) and carries such a wealth of clues, the mystery of its origins was, I felt sure, solvable.

Fig. 1. Three-quarter view of the Hughes of Bryngola sundial.

The most obvious clues to the dial's origins are the name and coat of arms at the south of the plate (Fig. 4). This is where you might expect to find the signature of the maker but "William Hughes Bryngola Esq^{r}." does not sound right for an artisan and no maker of that name is recorded. A few investigations quickly showed that Bryngola is a parish on the island of Anglesey, North Wales, in the locality of Llangwyllog, and that the Hughes family were prominent residents there in the 18th and 19th centuries. Thus it seems that it was William Hughes of Bryngola that commissioned the dial in 1775. The church of St Cwyllog in Llangwyllog has a number of 18th-century memorials for the family including the one shown in Fig. 5 which shows a William Hughes dying in 1793 and who is thus likely to be the dial owner as his son, also William, died much earlier. William Hughes was the son of Rowland Hughes of Lligwy (bt. 1702–1762)[1] who is described as "owner of Bryngola"

Fig. 2. Plan view of the dial, dusted in talc to emphasize the engraving.

Fig. 3. Profile of the gnomon. Note also the thick dial-plate.

– perhaps meaning he built it. Together with his wife Margaret Griffith, they had a daughter Mary who married a Dr Hugh Wynne of Chwaen Ddu (bt. 1760–1841) who was coroner of Anglesey for 47 years and described as "of Bryngola".[2] It is possible this marriage had some influence on the coat of arms (see below).

It is worth noting that another dial is known which is dated 1802 and was made for a William Hughes in North Wales: its maker is unknown.[3]

It might be thought that the coat of arms (*argent, a chevron gules between two dolphins and three fleurs-de-lys*) would be easily traceable to the Hughes family.

Fig. 4. The coat of arms and signature, with date and motto.

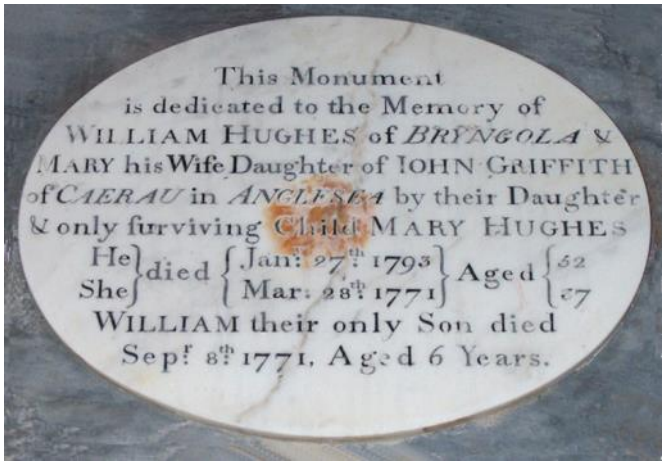


Fig. 5. Memorial to members of the Hughes family in the church of St Cwyllog, Llangwyllog.

The accompanying motto:

VIA TRITA VIA TUTA

(The beaten path is the safe path)

is a well-known Roman proverb but is very little used in heraldry. However, neither it nor the arms are officially recorded for the Hughes family.

Welsh heraldry is different to and more complex than that of England and is mainly based on the semi-mythical Fifteen Noble Tribes of the northern areas of the country, dating back to the pre-Conquest period.[4] The arms on the dial incorporate the features of the fifth Noble Tribe (*a chevron between three fleurs-de-lys*) which has been used by other Hughes families in Brecon and in Monmouthshire, synthesized with the addition of the dolphins included by the Wynne family (another family in the northwest corner of Wales) on their arms. It would not be the first time that Welsh families fabricated a coat of arms for themselves.[5]

The Back of the Dial

The dial is very substantial: it has a thickness in the range 9.3 to 10.6 mm – a nominal 3/8″ – and weighs 4.33 kg. The back of the dial (Fig. 6) is most informative. The first thing that is noticed is the set of engraved concentric circles, arranged in groups of 10 and 6, which are presumed to be a practice layout. Next, the ends of the gnomon tenons are visible but instead of being hammered over to retain them, they have been split along their length and then metal wedges driven in to spread the sides of the tenons so that they grip the inside of the mortice slots, which they still do very firmly. This is a technique which is rare on sundials but is quite common in woodwork and sometimes used by clockmakers.

Also visible on the back of the dial is a set of three blind-tapped holes for the inverted bolts which would have held the dial to the top of the pedestal, using large heads set in wet cement. Two of the holes still contain the sheared-off stubs of the bolts but the third was measured to be of a size just slightly smaller than 4 BA.

The most important feature of the rear of the dial is the single word "Owen" which is engraved near the centre (Fig. 6 insert). It would be easy to jump to the conclusion that this is the signature of the dialmaker but I have another suggestion. The Owen dynasty of Llanrwst, on the Welsh mainland but not far to the east of Anglesey, are renowned as perhaps the most important Welsh clockmakers of the 18th and 19th centuries.[6] The founder of the dynasty was John Owen (1719–96) and their prolific output was based on the use of components such as movements, hands and dials, imported from other centres, notably the Lancashire clockmaking area around Prescot, St Helens and Warrington which, although near Liverpool, is not very far from Llanrwst. Thus, a jobbing engraver at one of these centres probably engraved the Bryngola sundial as a part of a commission which John Owen had undertaken and would complete with a gnomon cast by another of his suppliers. The engraver would have written Owen's name on the back of the dial to identify it from other dials in the workshop.

A study of the engraving styles to be found on Owen clocks has been published[7] and has identified in particular "The Good Engraver" on account of the quality of his work. The most important example of this is the so-called Titley

Fig. 6. The back of the dial. Inset: a close-up of the gnomon tenons and the name "Owen".

longcase clock, named after the doctor and surgeon Peter Titley who commissioned it around 1772, just three years before the Bryngola sundial. The clock, auctioned in 2009,[8] features a superb silvered dial-plate which is an unusually thick quarter of an inch and weighs 4.28 kg. At the top of the plate (Fig. 7) is a beautifully engraved coat of arms for the thirteenth Noble Tribe of Wales (*argent, a chevron sable between three boars' heads couped the second*). The suggestion that the Bryngola sundial came from the same workshop cannot be proved but it certainly seems feasible.

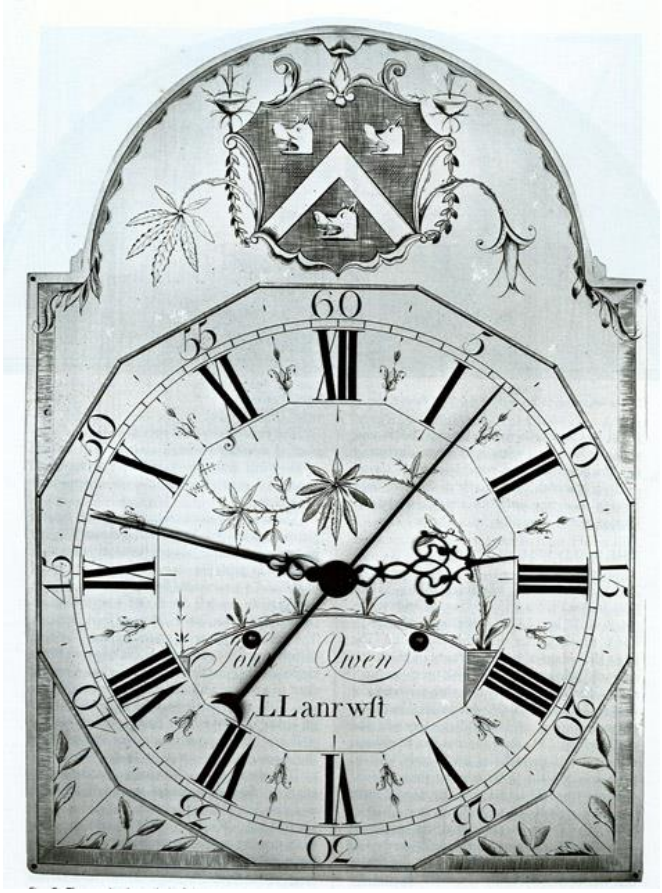


Fig. 7. The dial of the Titley clock by John Owen, attributed to "The Good Engraver". Photo courtesy of C. Brown.

Transversals

The use of transversals (Fig. 8), sometimes called diagonal scales, on astronomical instruments as a way of magnifying circular scales to allow a finer resolution, in a manner similar to a vernier, goes back a long way.[9] It is thought that they were first introduced on sundials – where they are not quite mathematically exact – by John Rowley on dials he is believed to have supplied to Thomas Tompion at the very end of the 17th century. They enjoyed a brief popularity amongst some of the best London mathematical instrument makers and then have reappeared sporadically in later centuries.

One of the provincial makers who picked up on the idea of transversals was Henry Sephton (1686–1756),[10] a Liverpool

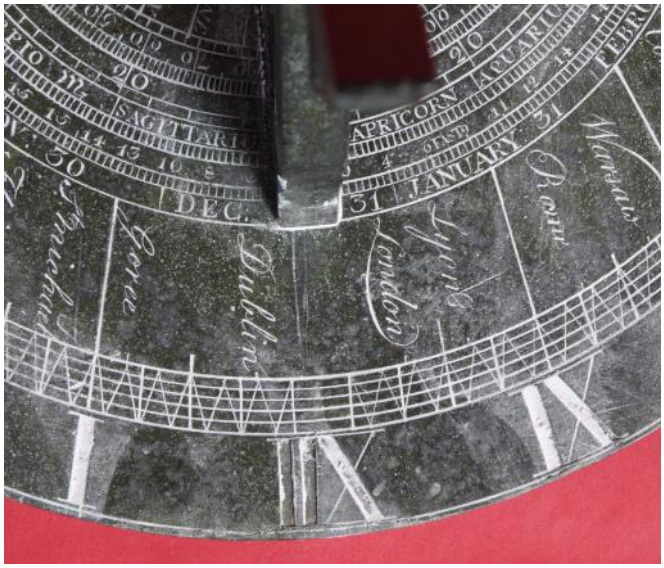


Fig. 8. Close-up of the dial-plate showing the transversals and the geographic place-names.

architect who designed and/or supplied several dials for the large houses of the area, including at least one double horizontal dial.[11] This dial, dated 1722, is 'signed' on the back "H Sephton W. Derby" in a similar manner to the "Owen" on the back of the Bryngola dial. A second double horizontal dial with transversals, unsigned but very probably due to Sephton, is at Knowsley Park, originally part of the famous estate of Lord Derby and then home to the Prescot Museum, housing a permanent exhibition of the history of clockmaking in the town.

The Sephton dials are about half a century earlier than the Bryngola one but there are strong signs that a capability for dial-making had been established amongst the engravers in Prescot and the tradition carried on long afterwards. It is noticeable that the main Roman numerals of the Bryngola dial are inward-facing, a style which was totally obsolete in London by 1775 but which had been used on the Sephton dials.

Slightly later still, around 1799, another Liverpool clockmaker, Thomas Harrison, supplied a sundial which included transversals and inward-facing numerals to a Mrs Piozzi for her house in Wales.[12] Harrison's workshop in Finney's Lane had previously belonged to Joseph Finney who was both a clockmaker and an architect.[13] Thus it seems that there was a distinct cluster of dials coming from the Liverpool area which can be traced back to the style developed by John Rowley nearly a century earlier.

Geography

The Bryngola dial features a set of worldwide place-names in the chapter ring with small marks against the timescale which allow their times of noon, in Anglesey solar time, to be read to a minute (Fig. 8). The list of place-names and their times are given in Table 1. The time offsets from local noon can be converted into the supposed longitudes of the places which helps to locate the more unfamiliar names.

For example, the 'Grand Rivr' is the Amazon, 'Pequ' is probably Pegu near Rangoon and 'C St Lucia' is thought to be Cabo san Lucas in the Mexico/California region.[14] Several of the other names such as 'Jaquita', 'Desolation Is' and 'Panuco' remain as interesting challenges for readers.

The longitudes of many places would have only been known approximately when the dial was made. However, the presence of astronomical observatories means that the times of noon of London (11:43.5) and Dublin (12:10) are likely to be accurate enough to allow the design longitude for the dial to be reverse engineered. The value, 4° 7.5′ W, is a reasonable match to the true value of 4° 21′ W. The latitude of 53° 17′ is also close to the measured gnomon angle of 53.5° so it is clear that the dial really was made for Anglesey.

EAST			WEST	
12:00	NOON		03:53	Manilla
12:10	Dublin		04:17	Pekin
12:50	Goree		04:39	Tonquin
13:17	St Michael I		05:15	Pequ
~13:45	Flores I		05:32	Bengal
~14:15	Jaquita		06:21	F St George
~14:45	Desolation I		06:49	Cinde Rr
~15:15	Grand Rivr		07:12	Cinde Rr
15:46	Martinico		08:13	Cape Glate
~16:10	Boston		08:21	Ispahan
~16:25	Williamsburg		08:47	Macca
16:49	Havanna		09:15	Damascus
17:19	N Orleans		09:46	Constantinople
17:44	Panuco		10:17	Warsaw
18:19	Aquaputco		10:44	Rome
18:41	C St Lucia		11:21	Lyons
19:11	St Clemet I		11:42	London
~20:15	C St Sebastian		12:00	NOON

Table 1. Place-names on the Bryngola dial.

Metallurgy

The composition of the Bryngola dial was analyzed by X-ray fluorescence (XRF). For the most reliable readings, a small area on the back of the dial was cleaned of all the patina using a small abrasive rubber cone rotating at high speed, leaving a bright 'brassy' surface: other measurements were also made on the front of the (uncleaned) dial and on the gnomon. The results are shown in Table 2. As expected, the material is basically a leaded brass with a medium level of zinc. The amount of lead (Pb) is quite high and partially explains the significant weight of what is a medium-sized dial. The reason for this high level would have been to improve the flow of the molten alloy – both the dial-plate and the gnomon were almost certainly cast and then the surface scraped flat, rather than hammered into a thin sheet.

There is a marked difference in the lead level between the back and the front of the dial-plate. Whilst part of this difference might be due to the weathering of the front surface, producing the observed dark patina and an accompanying 'dezincification', a bigger factor is likely to be the segregation of the lead which is rejected by advancing the solidification front as the molten alloy solidifies in a horizontal mould. This is the process which is employed in zone refining of high-purity materials.

The gnomon is of a very similar alloy to the dial-plate and was probably cast at the same time. There is no apparent segregation of the lead between the east and west faces: the value is midway between the levels of the front and the back of the dial-plate. This is likely to be due to the much faster solidification of the openwork gnomon, freezing-in the lead from the melt.

The level of iron (Fe), an unwanted but ubiquitous impurity in brasses until electrolytically-refined copper became available, is typical for the 18th century, as is the trace of arsenic (As).

Location	Cu	Zn	Sn	Pb	Ni	Fe	As	Others/Comments
Back, cleaned	75.7	20.1	0.2	2.9	nd	0.9	0.2	
Back, uncleaned	77.6	18.5	0.2	2.2	nd	1.3	0.2	
Front, uncleaned	75.7	11.2	0.2	10.3	nd	1.9	0.6	Bi 0.24
Gnomon, East	78.8	11.7	0.2	7.3	nd	1.8	0.2	
Gnomon, West	74.7	16.4	nd	7.2	nd	1.7	nd	

Table 2. Composition of the Bryngola dial (in wt.%, rounded to one place of decimals) as measured by XRF by the author using an Olympus Innov-X Alpha 2000 analyser with a 60 second sampling time and used in its 'Analytical' mode. The instrument was cross-calibrated against a set of CHARM (Cultural Heritage Alloy Reference Materials) test specimens with a representative range of trace elements in a copper-alloy matrix.[15] nd = not detected.

Conclusion

The dial is an excellent example of late 18th century provincial dialmaking and strengthens the links between clockmaking and dialmaking as well as shining light on the outsourcing methods then in use. It hints at the presence of a 'Liverpool school' of engraved dials lasting throughout most of the 18th century.

ACKNOWLEDGEMENTS

I am grateful to the following for help in deciphering this dial: John Allen, Irene Brightmer, Colin Brown, John Foad, Bill Linnard.

REFERENCES and NOTES

1. bt. means 'baptised'.
2. J.E. Griffith: *Pedigrees of Anglesey and Caernarvonshire Families,* Bridge Books, Horncastle (1914). I am grateful to Irene Brightmer for this information.
3. Colin Brown, personal communication.
4. *www.theheraldrysociety.com/articles/wales/arms_of_the_xv_noble_tribes.htm*
5. I am grateful to John Allen for assistance with the heraldry.
6. C. Brown and M. Brown: *The Clockmakers of Llanrwst – pre-industrial clockmaking in a Welsh market town*, Bridge Books, Wrexham (2002).
7. W. Linnard: ' "Occasion's Bald Behind": A neoclassical dial by John Owen of Llanrwst', *Antiquarian Horology*, 29(3), 359–70 (March 2006).
8. *http://writeantiques.com/antique-clocks-by-a-welsh-family-that-rival-the-best-in-the-world/*
9. J. Davis: 'Thomas Wright's horizontal sundials', *BSS Bull.* 16(iv), 135–143 (December 2004).
10. I. Brightmer: 'Henry Sephton – architect, mason and diallist', *BSS Bull.*, 22(iii) 46–52 (September 2010).
11. J. Davis and M. Lowne: *The Double Horizontal Dial and associated instruments*, BSS Monograph No. 5 (2010). The Henry Sephton DH dials are DH-64 and DH-65 (attrib.).
12. Irene Brightmer, personal communication. The dial is recorded in the BSS Fixed Dial Register as SRN 7873. See item 10 on p. 35 of this issue.
13. Joseph Finney I (1708–72) was primarily known for his complicated astronomical and musical clocks as well as being an architect. He was made a Freeman of Liverpool in 1732 and was succeeded by his son, Joseph II (w. 1770–96).
14. I am grateful to John Foad for consulting his database to provide these identifications.
15. A. Heginbotham, J. Bassett, D. Bourgarit, C. Eveleigh, L. Glinsman, D. Hook, D. Smith, R.J. Speakman, A. Shugar and R. van Langh: 'The Copper CHARM Set: a New Set of Certified Reference Materials for the Standardization of Quantitative X-ray Fluorescence Analysis of Heritage Copper Alloys', *Archaeometry*, doi: 10.1111/arcm.12117 (2014).

john.davis@btinternet.com

Postcard Potpourri 35
The High Hall, Steeton, Keighley, West Yorkshire

Peter Ransom

An impressive horizontal dial that is not listed in the BSS Register, possibly because it may no longer exist. Perhaps someone in the area could do some investigation to see if anything remains. The gardens are open under the National Gardens Scheme in 2016 on 19 June and 24 July, so an interesting visit for those in the area!

There are many pictures of The High Hall at *http://www.steeton.net/gallery2.html* and they include one which shows Alexander Keighley with the giant sundial and it is clear on that picture that the motto on the dial is SUMMER TIME with the initials A.K. and date 1934. So perhaps Alex Keighley is the man who is responsible for the dial. Alex Keighley (1861–1947), the son of Joseph Keighley, a wealthy worsted manufacturer, was a pioneer in the pictorial movement in photography.

In 1934 the *Keighley News* reported that "Mr Alex Keighley had a compass stone and a sundial erected in his garden,

GIANT SUNDIAL. THE HIGH HALL. STEETON

made from old millstones (probably 100 years old) from the Steeton Corn Mill".

The postcard is not dated and there is no mention of a publisher.

pransom@btinternet.com

A SCOTTISH SUNDIAL HOLDING SECRETS

ALASTAIR HUNTER

The sundial standing in the garden of a Scottish mansion some twenty miles from Edinburgh has long caught the eye of all who see it for its elegance and beauty and unusual design. It is the stone statue of a lady who carries a stone sundial balanced on her head (Fig. 1). The garden is at Lennoxlove, a house near Haddington with an ancient history going back to the 1300s. Dennis Cowan has already given us an excellent account of this dial in Part 3 of his series of articles on sundials in Scotland, and he says it has to be his favourite.[1]

In 2015, when I was making plans for a guided tour of sundials as a minor event for church fund-raising, I knew that Lennoxlove should be the highlight. The Duke of Hamilton, whose house it is, kindly agreed to our visit. I soon realised that not everything about this sundial is totally clear.

This article is about trying to discover as much as possible of the Lennoxlove sundial's history and, especially, the name of the lady in the statue. The story takes us to the court of King Charles II in London, to Renfrewshire in the west of Scotland, and again to Haddington. It turns out that calling this sundial 'unusual' is an understatement.

Historical Records for the Sundial

The Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS), established in 1908, keeps and maintains records for Scotland's historic buildings and monuments. The library and archives are open to the public, and the CANMORE website provides online access. Our sundial is recorded in two places, at Lennoxlove in the twentieth century, and before that at North Barr, Renfrewshire, in the nineteenth century.[2] Old photographs of the gardens at both places corroborate this information.

The well-known survey of Scotland's ancient buildings by David MacGibbon and Thomas Ross, published in 1892, was a precursor to setting up the Royal Commission. Its section on sundials describes the one at North Barr. Briefly, Ross says the sundial is "*singular and graceful*" although "*droll and quaint*", "*on the horizontal dial ... there occur the initials of Donald Macgilchrist with the date 1679*", "*the height of the lady 3 feet 11½ inches* [120 cm]*, height of lady and dial 5 feet 3½ inches* [161 cm]".[3]

Ross presented this work to a meeting of the Society of Antiquaries of Scotland in January 1890. He paid tribute to

Fig. 1. Sundial at Lennoxlove, rear and front views, September 2015.

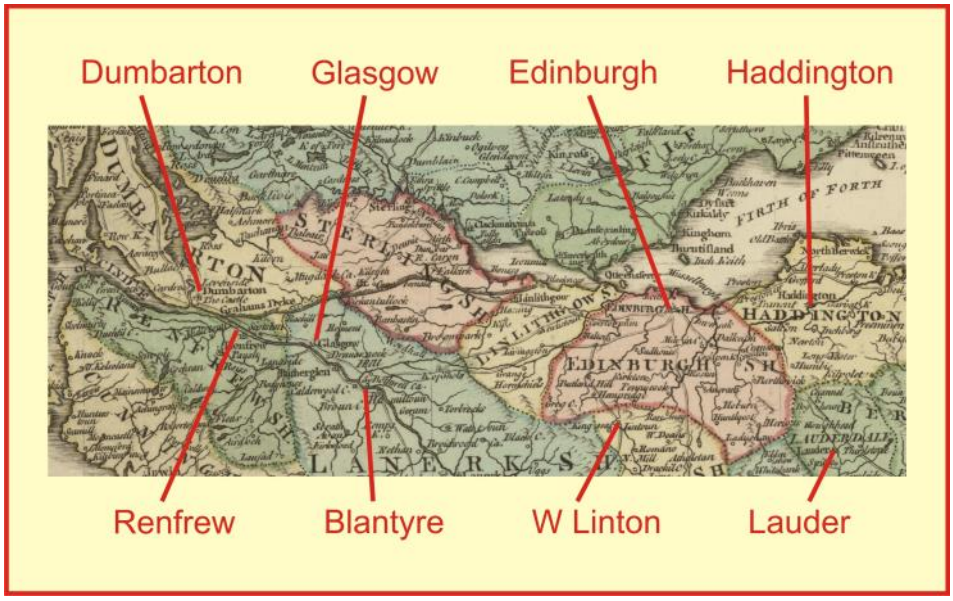


Fig. 2. Map of Scotland from 1769 with places highlighted for this article. Reproduced with the permission of the National Library of Scotland.

Mrs Gatty in helping him find many of the sundials for his survey, and to her *Book of Sun-Dials*.[4] He includes this note: "*Lord Blantyre, to whom North Barr belongs, kindly allowed ... to make a photograph of the dial for the purposes of this paper*".[5]

Nine years later in 1899, he presented a new paper to the Society, which discussed the work of a James Gifford who had been a local stonemason in the village of West Linton. Gifford did a number of relief carvings of his family on the walls of his house, and he carved one or two sundials.[6] He also carved a statue of his wife as a memorial to her, dated 1666. This originally stood at the village well, but during the nineteenth century it was erected on the clock tower. Ross suggested that James Gifford might have been the person who carved the sundial lady at North Barr.

Thus, the accepted history for our sundial came to be summarised by Andrew Somerville some ninety years later in his definitive study of Scottish sundials in 1987, also presented to the Society of Antiquaries of Scotland. His Appendix contains the succinct record,

"*LENNOXLOVE, E. Lothian. Octagonal head with horizontal on top, mounted on a plinth in the form of a lady in C18* [sic] *dress. Initials DMG (Donald Macgilchrist) & date 1679. Originally at North Barr, Renfrewshire, moved early C20. Believed to have been carved by James Gifford of W. Linton.*"[7]

None of this quite explains why Donald Macgilchrist's sundial at North Barr was made with a pedestal in the form of a lady, whether this was a special lady, who was Lord Blantyre, or why the sundial moved to Lennoxlove.

The North Barr Puzzle

Owner and date

The initials DMG and date 1679 were recorded by Ross cut into the stone on the horizontal dial, which is the top of the whole piece, and they are still visible today. No other visible marks appear on the sundial block or on the statue below. There seems little doubt that the sundial was made for Donald Macgilchrist of North Barr in 1679. However, an architectural heritage expert seeing a photograph of the sundial replied, "in my opinion we have two dates probably". To him, the statue was of dissimilar stone to the dial, in good condition, and not three hundred years old.

Donald Macgilchrist is recorded as purchasing the estate of North Barr on the banks of the River Clyde in 1670, and building his house there in 1676. The location is just west of Renfrew on the map (Fig. 2). He was a wealthy merchant of the city of Glasgow. At this time, the city was small and its great mercantile and industrial growth was still in the future. He married in the High Church and his children were baptised there, and he died in 1684. The last of the Macgilchrist family of North Barr sold the property in 1741.[8, 9] Little else is known about Donald Macgilchrist, except that his daughter married into the neighbouring family at the estate of Bargaran, and that his granddaughter started the world-famous Paisley textile industry. She was notorious, when young, concerning the Paisley witch trial![10]

Maker's name

There is no maker's mark on the sundial. Ross's idea, that James Gifford could have been the maker, is not supported by his own published sketches. There is a big difference between the elegant lady carved for the sundial at North Barr and the rather plain figure carved for West Linton (Fig. 3). This impression is reinforced by two RCAHMS photographs from the 1920s (Fig. 4).

By remarkable coincidence, within the last twenty years the firm of Graciela Ainsworth Sculpture Conservation in Edinburgh has worked on the stone of both pieces for separate clients. Graciela has restored the sundial lady, and has cast a copy of the West Linton figure. She knows more than anyone about their respective merits, and she explains: "The beautiful sundial lady is the work of a sculptor, the West Linton figure is the work of a stonemason." She goes on to say that the lady is very much in the Scottish

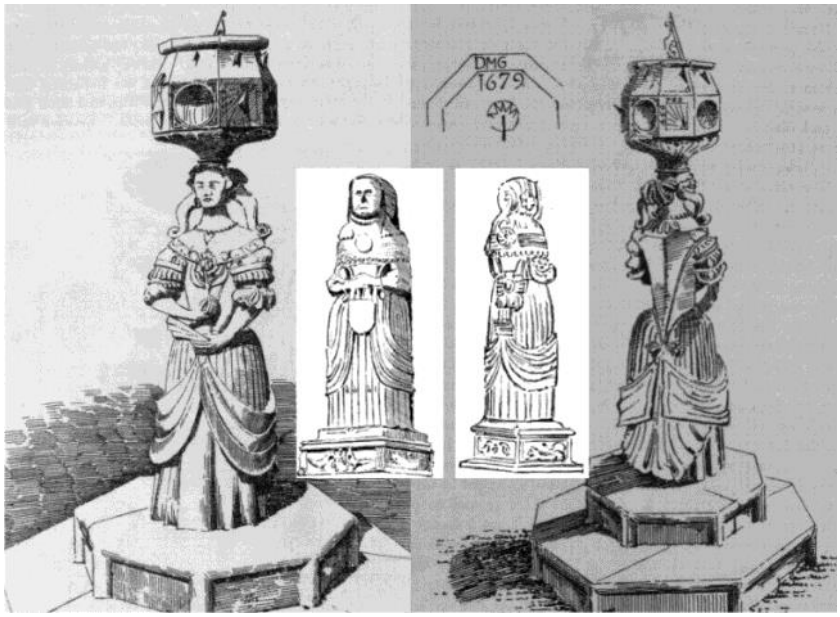


Fig. 3. Sketches published by Thomas Ross showing the sundial at North Barr and the statue of James Gifford's wife (inset).

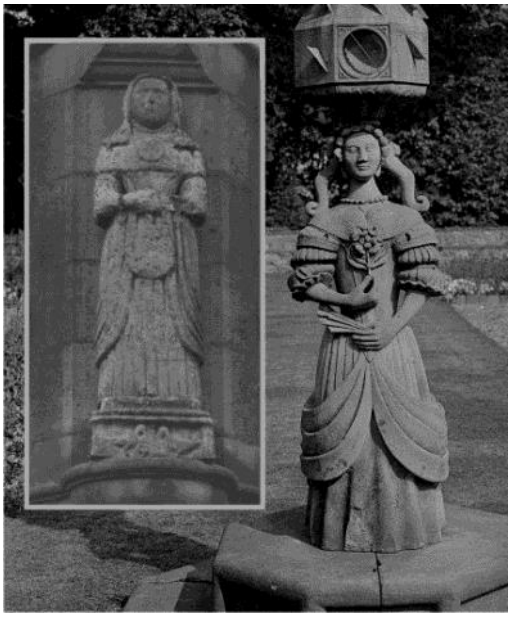


Fig. 4. The statue of James Gifford's wife (inset) and the sundial at Lennoxlove. Photos c. 1920: RCAHMS.

sculpture style, which she describes as "lively and humorous, and could equally belong to the seventeenth or the nineteenth century". Whoever commissioned the work could afford to employ a sculptor rather than a stonemason.

Architectural design

The horizontal dial is above eye level, much too high for anyone to read, which is a strange design (Fig. 5). Standing on tiptoe it is just possible to see it. While many Scottish sundials stand taller than head height, none has a horizontal dial on the top where it cannot be seen. A sundial at Cadder, drawn to scale in the inset, is about one foot (30 cm) lower than the one at North Barr (Fig. 6). The Cadder example has an architectural connection between the sundial and the pedestal that supports it, using foliage decoration in a classical manner. The North Barr sundial lacks this connection. It looks as though the sundial and the lady are not an original combination and at some point have been put together.

Statue identity

The statue is in the style of a lady at court in the seventeenth century, wearing a fashionable costume, with a necklace and earrings. She is a person of high rank. This is

Fig. 5. The faceted stone at Lennoxlove showing the horizontal dial above head height and the acanthus leaf decoration underneath, November 2009. Photo: Dennis Cowan.

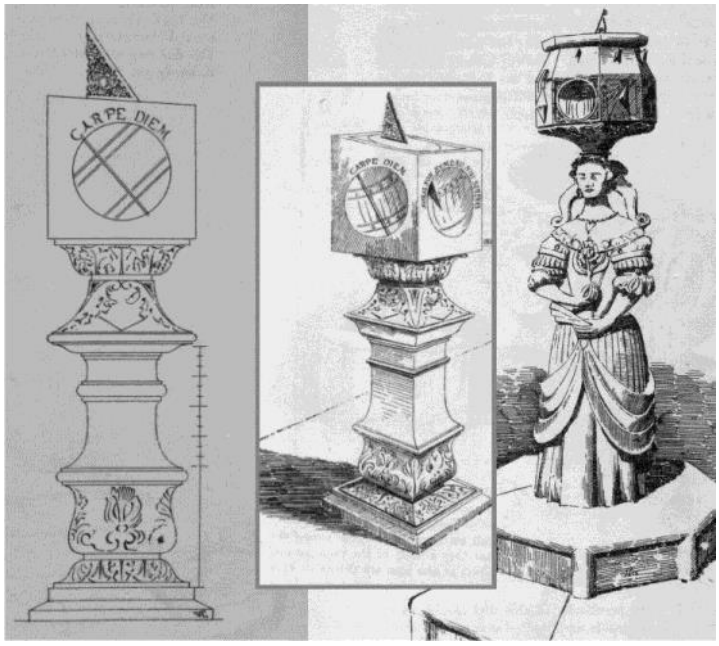


Fig. 6. Architecture of two sundials, at Cadder (left) and Lennoxlove, with Cadder dial (inset) reduced to scale.

an extraordinary figure to make into the pedestal for a sundial. Apart from anything else, Andrew Somerville's study makes it clear that because of the Calvinist outlook in Scotland at the time, decorative art like this was frowned upon.

There is nothing known about Donald Macgilchrist to explain why he would have had a sundial made so different from any other of his day, or to say he moved in the high circles of this lady. In our search for the name of the lady, and for the name of the person who commissioned her statue, we must look beyond North Barr.

The move to Lennoxlove

The records tell us that the sundial was moved from North Barr to Lennoxlove in the early twentieth century, a move which was right across Scotland from one side to the other, and the immediate question is what might have been the reason? Of course the sundial might simply have come onto the market and the owners of Lennoxlove might have bought it for their garden, but some link between the two properties sounds more likely. As will appear below, the owners of Lennoxlove never had a connection with Donald Macgilchrist or North Barr in his lifetime, nor with any of his descendants. If a connection existed it must have been at a later date, and this is the key to the continuing story.

Frances Stewart and Lennoxlove

Lennoxlove begins to offer a clue to what really must have happened. The house originally belonged to the Maitland family and was known as Lethington Tower. The Maitlands became the Earls of Lauderdale and interestingly Richard Maitland, 4th Earl of Lauderdale, owned one of the small number of double horizontal sundials known to have been made by Henry Wynne.[11]

At a later date, the Blantyres bought Lethington and called it 'Lennoxlove'. This was done under the terms of the will written in 1702 by Frances Theresa Stewart, Duchess of Richmond and Lennox. Both the purchase and the change of name were her legacy to her family.[12] In 1900, the house

Fig. 7. Frances Teresa Stuart,[13] Duchess of Richmond and Lennox, as the wax effigy in coronation robes made after her death in 1702 (left) and the portrait painted by Sir Peter Lely, c. 1663. Photos: Copyright, Dean and Chapter of Westminster (left) and The Royal Collection.

passed to the Bairds. In 1946, it was bought by the Hamiltons who occupy the house today. These names ring down the ages of the Scottish nobility and we have to disentangle them all to understand anything more.

Frances Theresa Stewart (1647–1702) was a great beauty. She was known as 'La Belle Stuart', and was one of the 'Royal Beauties' painted by Sir Peter Lely (Fig. 7). She is said to have been the original model for Britannia on British coins. Frances was a favourite of King Charles II at court in London, but she angered him when she married Charles Stuart, Duke of Richmond and Lennox. The Duke died five years later in 1672 leaving Frances a widow for thirty years.

She appears to have been shrewd with finances, persuading the King to grant her a pension and carefully managing her late husband's estates. In April 1702, she attended the coronation of Queen Anne who would be the last of the Stuart monarchs. In September she wrote her will, and in October she died. She instructed that a wax effigy should

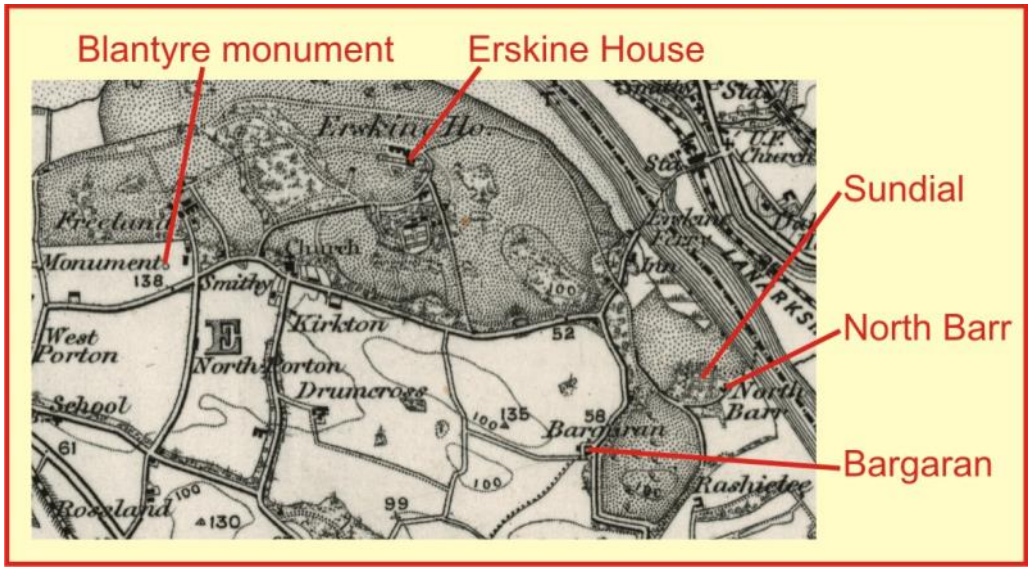


Fig. 8. OS Map of Erskine and North Barr in 1905. Reproduced with the permission of the National Library of Scotland.

be made in a true likeness of her and displayed in a glass-fronted case at Westminster Abbey wearing her coronation robes.[14, 15]

The Blantyres at Erskine

The Blantyres were Frances Stewart's cousins. Walter Stewart, 1st Lord Blantyre, was educated with the young James VI of Scotland (King James I), and was her grandfather. He was granted lands at the Priory of Blantyre.[16] Alexander Stuart, 5th Lord Blantyre, helped Frances manage her Lennox estates in Scotland, and was one of her executors after she died. She wished Alexander's son, who would soon be 6th Lord, to have a fine property of his own called Lennoxlove and to acquire the finest education, all as stated in her will.

The large fortune she left after personal legacies amounted to £10,000. Most of her possessions and jewellery were sold, although not her necklace valued at £1,200. With her money the executors bought lands and estates in 1703 at Erskine, Dumbarton, Haddington, and Berwick. The Haddington property was renamed Lennoxlove. Next door to the estate at Erskine was the house of North Barr, although the Blantyres did not own it at this time, see map (Fig. 8). We now have the potential link through the Blantyres between North Barr and Lennoxlove.

One hundred years later, Robert Walter Stuart, 11th Lord Blantyre, was a prominent person in his own right. He was a Major-General in the British Army and had served with the Duke of Wellington in the Napoleonic Wars. He had been Lord Lieutenant of Renfrewshire, and in 1825 his friends erected a monument at Erskine to honour him. This was designed by William Burn, architect in Edinburgh and London.[17] Lord Blantyre commissioned a new house at Erskine to replace the existing Mar Hall. It would be built by Sir Robert Smirke, designer of the British Museum in London, with gardens laid out by Sir Charles Barry, architect for the Palace of Westminster.[18] Earlier, in 1812, he had bought the two neighbouring houses of North Barr and Bargaran.

At last we are discovering someone who would have found it easy to employ the most skilled sculptor in stone, and who had access to the North Barr garden. Unfortunately, Robert Stuart was killed by accident in 1830, and never lived to see his great mansion house at Erskine completed. His son Charles Stuart, who was born at Lennoxlove, succeeded him as 12th Lord Blantyre and lived at Erskine until his own death in 1900.

An Explanation for the Sundial Statue

It is likely that Charles Stuart, or his father, or another member of the family, had a beautiful statue made in the likeness of Frances Stewart their ancestor who had done so much for them, and that they chose to surmount it with the existing sundial stone at North Barr. They could then visit Frances and her sundial whenever they wished. The

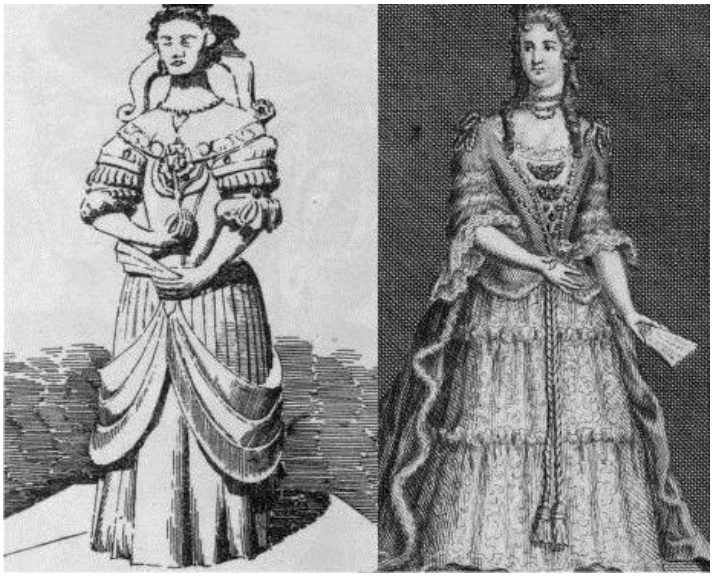


Fig. 9. Published sketches of the sundial statue (Ross, 1890), and the wax effigy in coronation robes (Dart, 1723).

sculptor could have used the wax effigy at Westminster Abbey to model his carving; there are striking similarities between them (Fig. 9). It was Charles Stuart, 12th Lord Blantyre, who in 1890 gave Thomas Ross permission to get a photograph taken of the sundial at North Barr.

So we come to the question of why does the statue look the way it does? We have to assume the sculptor has been commissioned to create the statue of a lady who died more than one hundred years earlier, and that she is to be the supporting pedestal for an existing sundial in the garden. The sources he has available to create her likeness consist of a number of full-length portraits painted during her lifetime, the surviving wax effigy at Westminster Abbey, a 1723 drawing of the effigy found in the published history of the Abbey, and all her personal belongings inherited by the family, including her clothes. These materials are certainly ample for a sculptor to start his work.

There is an additional problem, however: the neck and head of this refined lady are required to carry the heavy weight of the sundial stone. The problem is resolved by sculpting her ringlets of hair into strong stone sidepieces supported from her shoulders. It is an elegant solution, which emphasises the beauty of her slender neck, and allows her to display her necklace and earrings. Her costume is selected from her own wardrobe to be suitably fitting for a stroll in the garden, different from the draped finery of her royal portraits or the formality of her coronation robes, but identifiably belonging to fashion at court in the seventeenth century. The train attached to her dress is very clearly shown at the rear of the statue, and in her left hand she holds this up at the front as well. This was normal and she would let the train down in the presence of the monarch. In her right hand, the wax effigy holds a rose as a nosegay, but the sculptor has developed this into the artistic feature of a rose in full bloom gracefully carried by her curving wrist and fingers. Perhaps he took this idea from the way the front of her coronation dress is decorated. The fan in the

left hand would quickly be damaged on a stone sculpture but, instead, making her hand hold the train resolves this problem. A final and perhaps defining similarity is the profusion of ribbons in her hair, which are prominent in both the statue and the wax effigy, and were the height of fashion at court in her day.

Lastly, to return to Ross's comments, he noted that both the Gifford statue and the sundial lady display the motif of a rose, and that there is a separate carving of Gifford's wife with her five children, one of whom is carried on her head. So Ross knew of two ladies with roses and with an object on their head, which made him wonder if Gifford carved them both. However, Ross himself describes the drapery on Gifford's carved statue as "*stiff and formal*", which one could not say about the sundial lady. It seems that Ross was curious about the North Barr sundial, just as we are today.

The Twentieth Century and the Present Day

Charles Stuart held lands and estates in the counties of Haddington, Berwick, Lanark, Renfrew, and Dunbarton, but he died with no living male heir. His estates passed through the family of Sir David Baird of Newbyth, who had married his second daughter Ellen, to his grandson Major William Baird.[19] In 1912, Major Baird commissioned the prominent architect Sir Robert Lorimer to remodel Lennoxlove and its gardens. This is the time that the sundial moved across from North Barr.

Erskine House lay unoccupied until the First World War, when it became the pioneering hospital for limbless soldiers that developed into today's Erskine Homes for Scotland's veterans. The old mansion is now Mar Hall, a luxury hotel called after the ancient name for the site. Erskine has become a wealthy new town near to Glasgow, with street names echoing former days: North Barr Avenue, Bargarran Road, Blantyre Court, Baird Drive.

Frances Stewart's private possessions left to the family include a magnificent tortoiseshell and ebony cabinet given to her by the King, which is on public view at Lennoxlove, and a priceless silver-gilt toilet service of seventeen pieces now owned by the National Museum of Scotland.[20]

Conclusions

The historical record identifying the original owner of the Lennoxlove sundial as Donald Macgilchrist of North Barr in Renfrewshire, and the original date as 1679, appears correct. There are reasons to think the sundial was once separate from the statue—sundials did not embody decorative art in Calvinist seventeenth-century Scotland, the horizontal dial on top is too high to read, the architecture does not connect the pieces together, and the stones are dissimilar. Over the years, the statue of a lady used as the unusual pedestal for a seventeenth-century sundial has aroused curiosity. There is some resemblance to the work of a particular country stonemason that might partly explain it, as Ross noted, but this is discounted here. The lady does look like someone special. Her elegance and seventeenth-century costume suggest high rank and status at court. There is nothing known about Donald Macgilchrist that would place him so high. In this article an explanation is put forward for how the sundial lady came to be carved by an accomplished sculptor and built with a sundial on her head, and to stand first in the garden at North Barr and then at Lennoxlove, which is summarised below.

Frances Theresa Stewart, Duchess of Richmond and Lennox, is the person who gave her name to Lennoxlove, and she seems the probable subject for the statue. Under the terms of her will written in 1702, as a legacy to her Scottish family who were the Blantyres, Lethington was bought with her money and renamed Lennoxlove. The legacy ran to buying other properties as well, including Mar Hall at Erskine. Eventually in 1812, the 11th Lord Blantyre purchased North Barr next door to his own estate at Erskine, so he was the first to create a common link between Lennoxlove and North Barr.

Frances Stewart was such a celebrated beauty that King Charles II admired her and she is still remembered as 'La Belle Stuart'. One imagines that the Blantyre family decided to commission a stone statue in her memory sometime in the nineteenth century. This stood in the North Barr garden crowned by the garden's ancient sundial. After 1900, when the 12th and last Lord Blantyre died, the family lived at Lennoxlove and moved the sundial there. It cannot be proved that the sundial lady who smiles on us now at Lennoxlove is truly Frances Theresa Stewart, but one can only ask: if it is not her then who else can this possibly be?

ACKNOWLEDGEMENTS

The Duke of Hamilton and staff at Lennoxlove encouraged this study of the unique sundial in their garden. The National Library of Scotland, The Royal Commission on the Ancient and Historical Monuments of Scotland, and Westminster Abbey Museum provided advice, access to their collections, and permission to use images. Alex Puddy of Architectural Heritage offered a personal opinion on the sundial's date. Graciela Ainsworth, with her specific knowledge of both the sundial lady and the Gifford figure, explained the artistic and technical differences between them. The Internet provided much key information, verified also where possible from independent sources.

REFERENCES

1. D. Cowan: 'In the footsteps of Thomas Ross. Part 3: The sundials of James Gifford', *BSS Bulletin*, 24(iv), 6–9 (December 2012).
2. *The online catalogue to Scotland's archaeology, buildings, industrial and maritime heritage* [*http://canmore.org.uk/site/43273/erskine-north-barr*. See also *site/56548/lennoxlove*]. Note: Another site on the original North Barr estate [*site/43083*] was once owned by the Macgilchrists but is not relevant to this article.
3. D. MacGibbon and T. Ross: *The Castellated and Domestic Architecture of Scotland from the Twelfth to the Eighteenth Century, Volume Five*, David Douglas, Edinburgh (1892).

4. A. Gatty, H.K.F. Gatty and E. Lloyd: *The Book of Sun-Dials*, 2nd edn, George Bell and Sons, London (1889).
5. T. Ross: 'Ancient sundials of Scotland', *Proceedings of the Society of Antiquaries of Scotland*, 24, 161–273 (1890).
6. T. Ross: 'James Gifford, a Scottish sculptor of the seventeenth century, and some of his works in Tweeddale', *Proceedings of the Society of Antiquaries of Scotland*, 33, 147–162 (1899).
7. A.R. Somerville: *The Ancient Sundials of Scotland*, Rogers Turner Books, London (1990).
8. G. Crawfurd and G. Robertson: *A General Description of the Shire of Renfrew, and Noble Families, from 1034 to 1710, and continued to the present*, printed by Neilson, Paisley (1818).
9. 'Family Central Network, Donald McGilchrist – Janet Aiken', [*http://www.familycentral.net/index/family.cfm*]
10. *https://en.wikipedia.org/wiki/Paisley_witches*
11. J. Davis and M. Lowne: *The Double Horizontal Sundial*, BSS Monograph No. 5, The British Sundial Society, London (2009).
12. S. Handley, 'Stuart, Frances Teresa, Duchess of Lennox and Richmond (1647–1702)', *Oxford Dictionary of National Biography*, Oxford University Press (2004, online edn Jan. 2008) [*http://www.oxforddnb.com/view/article/26703*, accessed 2 November 2015].
13. The variations in the name in this article have to be seen in historical context; Frances Theresa Stewart is her full name as it would be known in Scotland, and as referred to today at Lennoxlove. However, at court in France and then London she was known as Frances Teresa Stuart, two spelling changes. The text uses 'Frances Theresa Stewart', while the references and figure captions remain as found.
14. C.H. Hartmann: *La Belle Stuart: memoirs of court and society in the times of Frances Teresa Stuart, Duchess of Richmond and Lennox*, Routledge, London (1924).
15. J. Dart: *Westmonasterium or The History and Antiquities of the Abbey Church of St Peter's Westminster*, London (1723).
16. *http://www.cracroftspeerage.co.uk/online/content/blantyre1606.htm*
17. *https://en.wikipedia.org/wiki/Blantyre_Monument*
18. *http://www.clydewaterfront.com/clyde-heritage/erskine/erskine-house*
19. *http://www.cracroftspeerage.co.uk/online/content/bairdb1809.htm*
20. *http://www.nms.ac.uk/explore/collections-stories/art-and-design/lennoxlove-toilet-service/*

For a portrait and CV of the author, see *Bulletin* 25(i), March 2013. He can be contacted at *sundials@macmillanhunter.co.uk*

NEW DIAL

A Direct East Moon Dial

Some years ago a client asked for a south-facing vertical sundial for a new building. Further building work on a direct east-facing wall meant another dial; this time it was to be a moon dial (Fig. 1). He asked that the gnomon be modelled on the nodus star of the direct east-facing dial at Albi cathedral. He can use it as a sundial too, with the help of a chart placed within a nearby porch (Fig. 2).

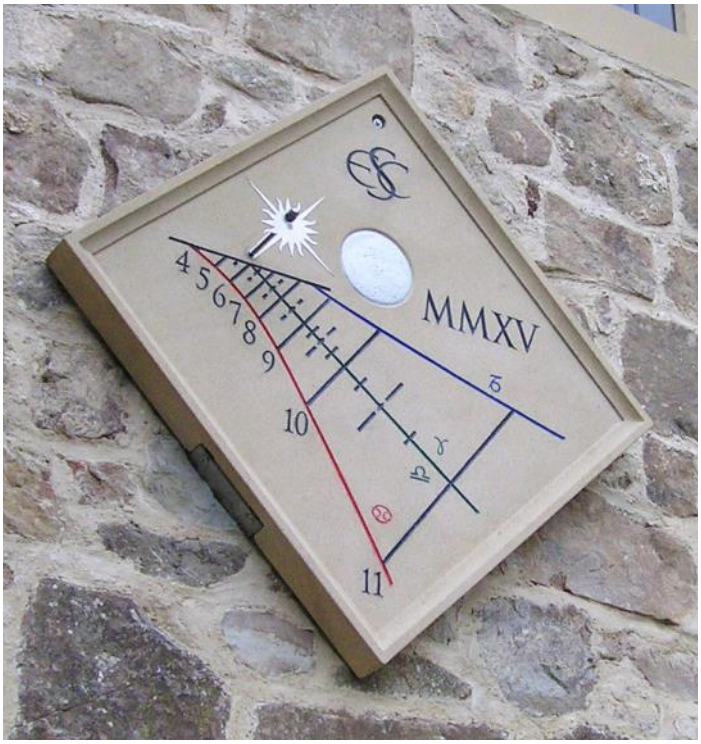


Fig. 1. Moon dial.

Fig. 2. Moon dial and Equation of Time data.

David Brown david@davidbrownsundials.com

A FRENCH THREE-IN-ONE DIAL

MIKE COWHAM

A recent holiday in France led us to various churches and other buildings displaying some interesting dials. One that I photographed was at Saint-Bouize, a town on the River Loire in Department Cher (no. 18), where a simple vertical dial was painted on a buttress (Fig. 1). This dial declines slightly to the east.

On returning home and examining my photographs I realised that the dial at Saint-Bouize was not the first dial to have been placed on this buttress and that it had traces of two earlier dials beneath it.

The first, on the right-hand side of the dial, now placed between numerals III and IV (Fig. 2), is probably quite an early one, perhaps before 1500. It has at its centre an eight-sided star with one side of each point going straight towards its centre. It almost looks like a waterwheel. It has Roman numerals around it from VI to XII to V.

Then, looking closer at the original photograph I noticed what looked like a gnomon hole just below the modern dial, and below that six small holes (Fig. 3). I immediately

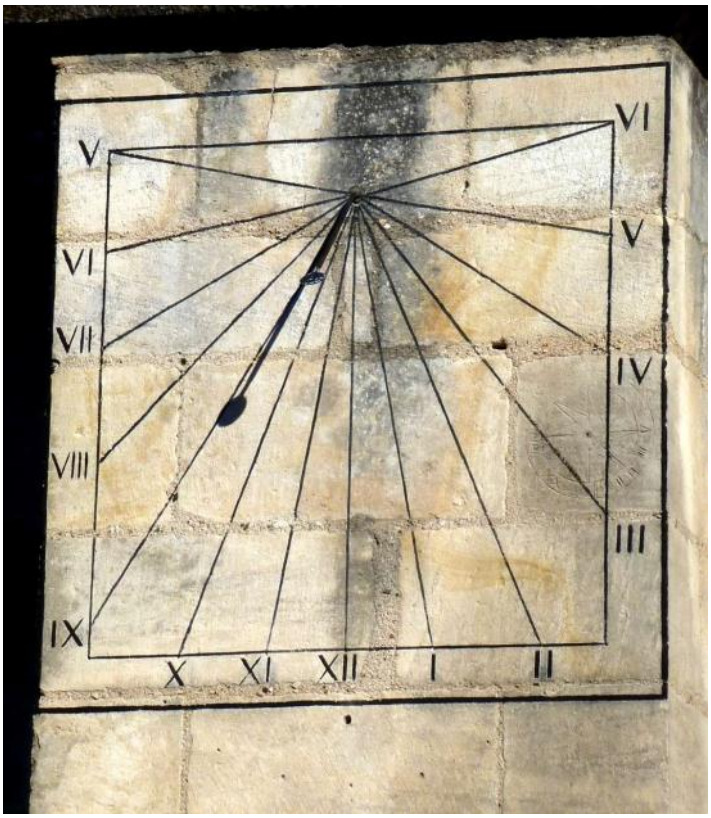


Fig. 1. Dial on buttress at Saint-Bouize, France.

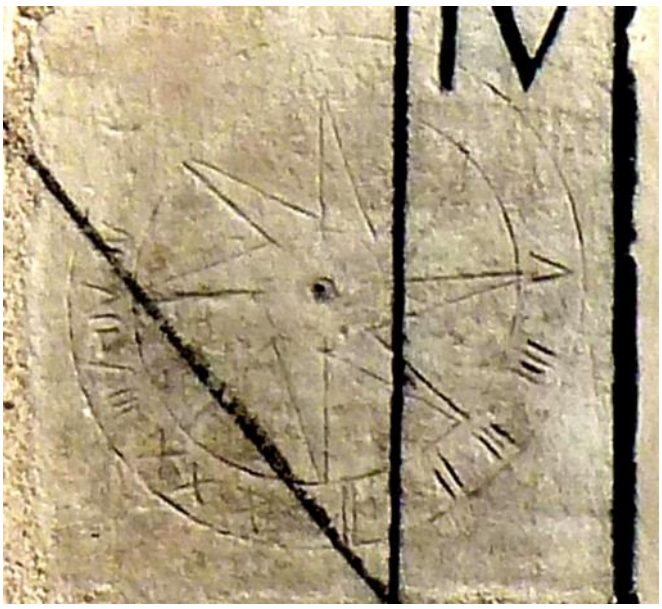


Fig. 2. An early dial remaining on the buttress.

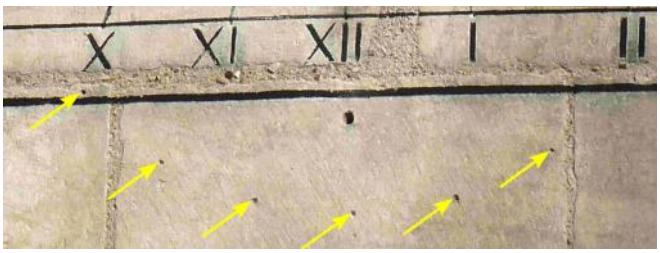


Fig. 3. The marks showing the position of the hour lines.

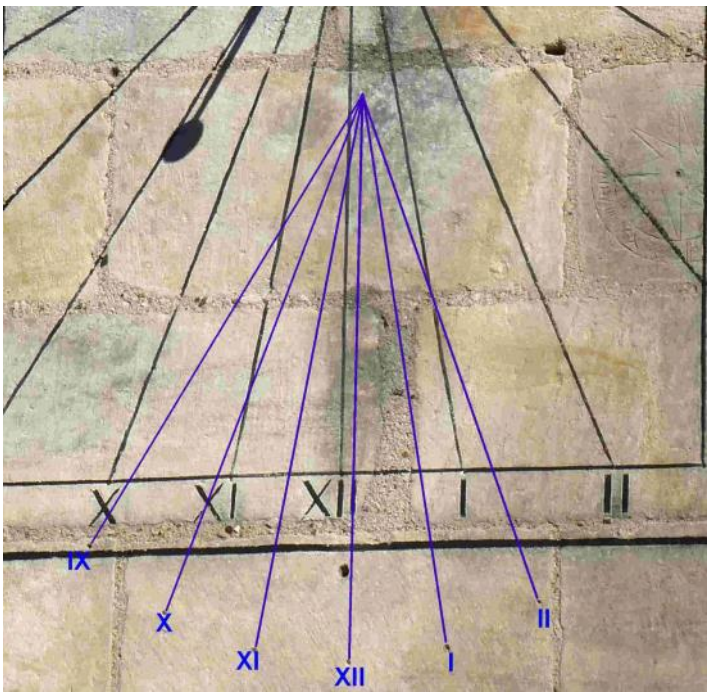


Fig. 4. The third dial on the buttress.

realised that these were from yet another dial. The large hole that I thought was for a gnomon was now obviously the hole for the lower supporting arm of the gnomon. Traces of the hole for the top of the gnomon were not to be seen. I therefore copied the angles of the modern hour lines from each of the hole positions showing that the gnomon hole was possibly near the top of a stone above (Fig. 4). Unfortunately there are lines only for the hours of IX to II and all signs of any painting or other inscriptions are now lost.

mike@brownsover.orangehome.co.uk

READER'S LETTER

Viking Sun Compass

May I say how totally I am in agreement with Patrick Arnold (Newbury Report, *BSS Bulletin* 27(iv), pp. 39–40, December 2015) that the purported 'Viking sun compass' is nothing of the sort, although I thought it was found in a Benedictine nunnery but perhaps it was close to a farm building associated with this. The object is undateable as it was found in rubble from an earlier building beneath the convent, not in excavated strata. Carbon-14 methods offer a date between 925 and 1015 for these layers. Suggestions that it was a fragment of a bearing dial led to a round table examination of it being organised at the Royal Geographical Society, the proceedings of which were published as E.G.R. Taylor, W.E. May, R.B. Motzo and T.C. Lethbridge, 'A Norse bearing dial?', *The Journal of the Institute of Navigation* vii, 78–84 (1954).

In summary, the conclusions were that Taylor rejected the interpretation totally, considering it to be a purely decorative object; May thought there was insufficient evidence to determine its function; after a careful reconstruction Motzo concluded that "whoever made it was not bothered either about direction or accuracy" and thought it was probably a bread mould, possibly for wafers later to be consecrated for mass. T.C. Lethbridge concurred with this and suggested several other possible domestic uses for it.

That it has come back into consideration in recent years as a navigational device is partly because of the attractively produced piece of pseudo-scholarship arguing from a pre-conceived position by C.L. Vebæk and S. Thirslund, *The Viking Compass Guided Norsemen First to America* (1992), although this does contain good photographs of the object in question and discusses another object for which the same function is claimed.

Anthony Turner
Paris

Kitchener's Sundial in Palestine

Further Information

John Davis

When our Polish member Maciej Lose saw this article in the March 2016 *Bulletin*, he immediately remembered seeing the same design in an auction catalogue c. 2012 and, with admirable forethought, he had even captured the image. It shows what appears to be identical metalwork though here the top of the plate can be seen, with moveable shutters over the apertures and some inscriptions which, frustratingly, are illegible. The exact details of the auction weren't recorded.

If there are two dials to this design then the likelihood is that it was not a one-off design by Kitchener and there could be more, so members should be on the lookout. With this design, it can be made to work at any latitude simply by tilting it appropriately. Given that the inscriptions on the Kitchener dial are in French and that France was quite keen on analemmas and heliochronometers in the 1870s, the chances are that the dial was made by an instrument maker there – perhaps by Flechet or Berthiaud, or a similar maker.

john.davis@btinternet.com

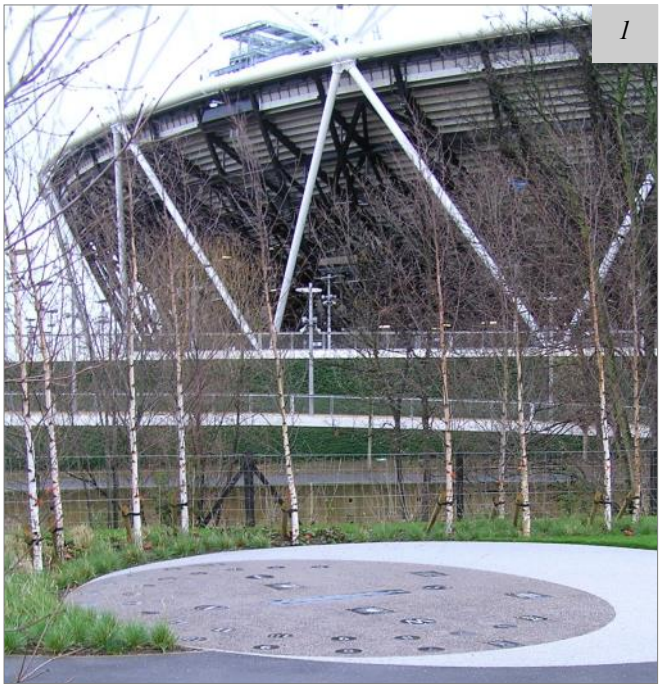
BSS SUNDIAL AWARDS 2010–15

The Society's fifth award scheme for excellent sundials covered the period 2010 to 2015. It was again successful, resulting in an interesting and fine exhibition of dials. As the primary goal is to encourage the design and restoration of sundials, the trustees decided to award certificates to all entrants who submitted an accurate and well designed dial or well executed restoration, with dials judged to be of particular merit being Highly Commended.

Fourteen dials were submitted; one of these was a reproduction and one was a restoration. There was a wide geographical spread, with three continents being represented. Photographs and full descriptions of all the submissions, as supplied by the submitters, were put on the Society's website and comments invited. Brief summaries are given below, but full descriptions can still be inspected on the website at *http://sundialsoc.org.uk/tag/award2015/*

On behalf of the Society the trustees sincerely thank Doug Bateman, Jackie Jones, Graham Stapleton and Bill Visick for all their administrative input.

The Trustees



1

1. **David Brown: Analemmatic 'Silver' sundial**. Designed for the Olympic Park; surrounded by silver birch trees, with stainless steel numerals set in blue/black slate. Hour markers for winter and summer time. A fairly standard dial of its type.

2

2. **David Brown: Double horizontal**. A large (520 mm across flats) octagonal dial, following published details in a BSS monograph. A superb example of this type of dial, beautifully engraved, with a brass gnomon, and with a rotatable rule. Highly Commended.

3

3. **David Brown: Inclining dial**. A very large (4.5 m) dial in a public park. Located on the site of a former floral clock. Portland stone for the dial base, with hour markings and numerals in green slate. The gnomon is 25 mm thick stainless steel with a large nodus, and corresponding equinox and solstice lines. There is an explanatory stainless steel plaque with Equation of Time. A very well made and attractive dial.

4. **Tim Chalk: Dial and solar calendar**. A rugged sculptural dial in the Ben Lawers national nature reserve. A vertical slab of grey reinforced concrete carries a conventional dial together with an aperture to give a spot of light on an inclined slab. The latter has a vertical line marked with the months so that the spot of light follows the seasonal variations. Suited to the wild environment!

5. **Tim Chalk: "Katie Wearie's hours" sculptural dial**. Responding to a public request for a memorial to a 19th-century cattle drover, the commission was won by an outstanding bronze sculpture of the drover resting under a tree, with a blackbird atop to act as gnomon for the surrounding ground level dial. A bench encourages visitors to rest adjacent to the dial and garden. Highly Commended.

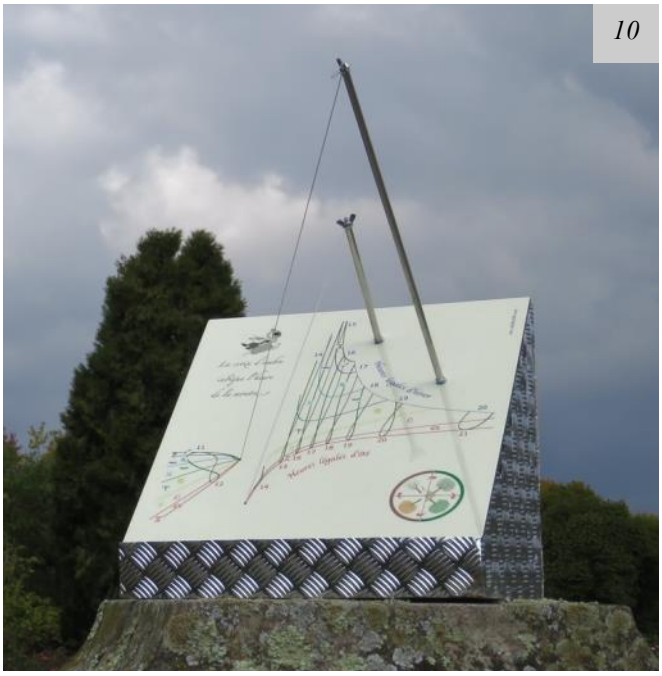
6. **Tim Chalk: Fossil dial**. A dial in a 'carved' recess in a 400 mm ball (actually cast in glass-reinforced concrete with polished surfaces) located in Rutland Square Gardens, Edinburgh. The dial proper is a simple equatorial dial with gold-leaf-covered gnomon rod and hour band. The dial is on the end of a bench adjacent to a fossil tree stump.

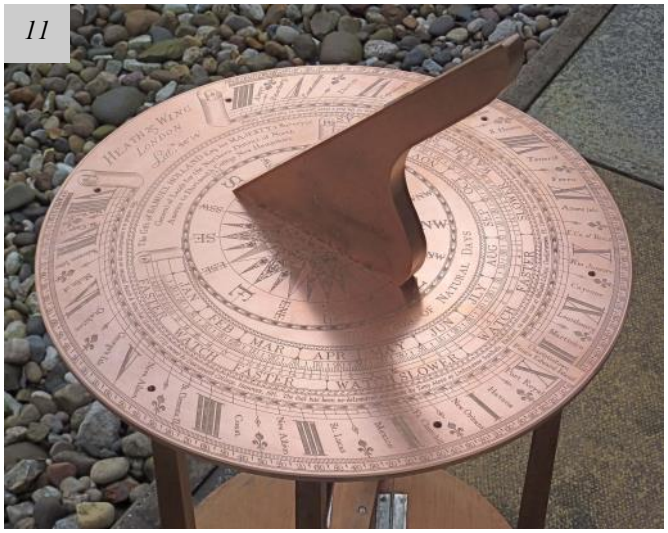
7. **Tim Chalk: Strathallan School centenary dial**. A large (1.2 m) free-standing wheel, similar in form to a millstone. The surface of the cast concrete is decorated with leaves. The symmetrical south-facing vertical dial markings and numerals are in bronze. Centenary details are on an engraved glass centre.

8. **Alastair Hunter: Dihelion**. A decorative dial that acts as a horizontal dial and an altitude dial, the latter indicating the seasons. A floral theme in its form.

9. **Harriet James: Art Deco dial**. A vertical dial inspired by Egyptian motifs, colours and symbolism of the Art Deco period of the 1920s. Brightly painted slate as a dial within a separate outer frame. Also with glass faceted 'jewels'. Well made but some commentators would have preferred not to see the brickwork background.

10. **Eric Mercier: Bifilar declining and reclining dial**. A complex meantime dial located in Nantes, France. There is an analemma at each hour. Constructed in modern materials. The orientation of the dial plate restricts the time telling to 11:30–20:00 hours.





11. **Tony Moss: Heath and Wing reproduction**. A densely delineated horizontal, true to the original design. Unusually, in a bright phosphor-bronze, but this will patinate with time. Etched instead of engraved, but a lens would be needed to detect the difference. Installed by the clients in Canada. A masterly example of modern craftsmanship.

12. **Charles Perry Restorations, Ltd: Isleworth Church restoration**. A fine vertical dial (SRN 2246) that has been very carefully and beautifully restored, attempting to follow the original 18th-century design but with fresh delineation. Highly Commended.

13. **James A. Stegenga: Brazil map sundial**. This horizontal sundial is in the southern hemisphere. It is located is about 2° north of the Tropic of Capricorn. The dial plate is in the shape of Brazil and between adjacent pairs of hour lines there are half-hour and quarter-hour tick marks. The design incorporates thirteen green nail heads which mark the locations of thirteen cities in Brazil. The quality of the photograph may not do this dial justice.

12

13

14

14. **Rebecca Cummins and Woody Sullivan: The Oculus Table**. This is a moveable table sundial in San Francisco. The large bowl, about one metre in diameter, is in a 'table' on a trolley that can be moved around the room! This is to intercept the sunlight from any convenient window, or from an 'oculus' in the ceiling. Visitors have landmarks to align the trolley due north, and the small ball in the centre of the glass top will cast a shadow as per a Greek scaphe dial. Children can read the time, and use a felt pen to mark on a subsidiary inverted bowl to mark the position of the sun. Several such marks will reveal the track of the sun. Highly Commended.

Beware Elephants!

Photo: Katie Chan, Creative Commons.

Vandals and metal thieves are sadly too-well-known enemies of sundials in public places. Now we need to add the danger of wandering elephants. Martins Gills has pointed out that the spherical dial at London Zoo (SRN 2538) inclines to the south rather than to the north. The sculptor, Wendy Taylor, tells me that many years ago it was "nudged by an elephant", and broke away from its moorings. It was immediately re-instated by the foundry that originally cast and installed it, but sadly the foundry were no gnomonists! Miss Taylor has said that she will look into it. No doubt it will take some time for matters to be put right, but anyone visiting the zoo this summer could perhaps check on it and let me know, so that I can update the Register.

John Foad

IN THE FOOTSTEPS OF THOMAS ROSS
Part 15: Sundials on Scottish Churches

DENNIS COWAN

Although I have seen around sixty-five sundials on Scottish churches, Thomas Ross recorded only around thirteen of them in volume 5 of *The Castellated and Domestic Architecture of Scotland.* [1] Four of them have previously been covered in other articles in this series,[2, 3] and another will be the subject of a future article, so this article will only concern itself with the remaining eight locations.

The sundials that I have seen on English churches have in the main been south facing and mounted on either the tower or the porch, but this is not generally the case in Scotland, particularly on 17th-century churches. These are almost invariably mounted on the south-west corner with many having a pair of dials on the south and west sides of the corner as at Legerwood (Fig. 1), indicating to me that services probably tended to be held in the latter part of the day rather than in the morning. There was a practical purpose too – where there was an external bell rope, it was always to be found hanging down on the west side of the church (Fig. 2). Very convenient – check the time on the sundial and walk backwards a few feet to ring the bell.

Fig. 2. The external bell rope at Legerwood.

Fig. 1. A typical 17th-century Scottish church with a two-faced sundial wrapped round the SW corner. This dial is at Legerwood in the Scottish Borders where I later found that my great-great grandmother was christened in 1830!

However, only one of the eight sundials described below follows this exact pattern.

Ross says of the dial on the church at Yarrow in the Scottish Borders:

"*The sketch of this dial* [Fig. 3] *is taken from the* Reminiscences of Yarrow. *It contains the motto WATCH AND PRAY TYME IS SHORT, with the initials I.F.M. with M. above and 1640 below. The maker's name is concealed in the monogram, R.M. FECIT.*"

The dial has Roman numerals and looks very much the same today (Fig. 4) except that part of the gnomon is missing. There is some dispute as to whether this dial is original to Yarrow, but as the church was built in 1640 and the dial is dated 1640, I suspect that the dial is original to the church. Despite what I said above, in Yarrow's case the church bell is unusually at the centre of the church; however, the polygonal apse including the bell and its

Fig. 3. Ross's sketch of the dial at Yarrow.

Fig. 4. The Yarrow dial today.

Fig. 5. Yarrow church showing the polygonal apse and tower that were added in 1906.

Fig. 6. Ross's sketch of the dial at Cortachy made from a rubbing provided by Mr George Miln.

tower were only added in 1906 (Fig. 5). The church's most famous worshipper was the 19th-century poet and writer, Sir Walter Scott.

Moving up north to Cortachy in Angus, Ross commented that:

"*the dial here* [Fig. 6] *is surrounded with an ornamental frame in the convoluted style of the seventeenth century. On either side of the frame are the initials K.C., which probably mean either Kortachy Church or Kirk of Cortachy; on the lower side the motto UT HORA FVGIT VITA, and on the top the date 1675. The gnomon is fixed in the centre of a figure of the sun. This sketch is made from a rubbing kindly made for us by Mr. George MiIn, architect."*

Fig. 7. The Cortachy dial today.

Today the dial, which has Arabic numerals, is still as it was in Ross's day apart from some flaking most notably in the bottom left-hand corner (Fig. 7). This church was built in 1828 on the site of a medieval church so was still fairly modern to Ross. Perhaps the dial, dated 1675, came from the earlier church.

At Inveresk in East Lothian, only a few miles from Edinburgh, Ross says that:

"there are two dials here, lying loosely against the walls of the church. One of them [Fig. 8] *is of very great interest, as it bears the inscription ARCHIBALDI HANDASYDE PISCATORII FECIT MDCCXXXV, with the motto SIC TRANSIT GLORIA MUNDI. Piscatorii is a classical form*

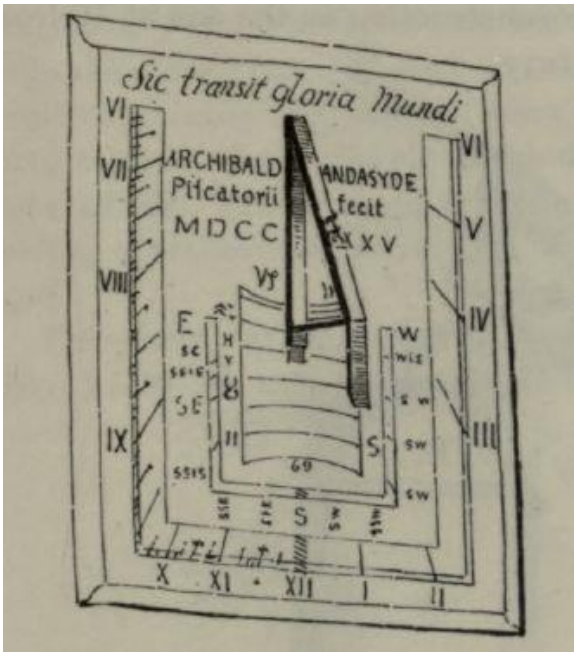


Fig. 8. Ross's sketch of the south-facing dial at Inveresk showing the detail.

of the name of the neighbouring village of Fisherrow, where Handasyde lived at that time. He was fond of classical names, and he invented the name of "Conchi Polensis" for the town of Musselburgh when he lived there. Handasyde was evidently a regular dial maker, and probably made the plain dial lying beside the above one [Fig. 9] … *The chief dial at Inveresk has a rounded moulding on the edge, and is, scientifically speaking, of complicated construction; the gnomon is open, and made of hammered iron, with a slight artistic touch in the centre.*[4] *The companion dial has a similar moulding round its sides, and has also a wrought-iron open gnomon.*

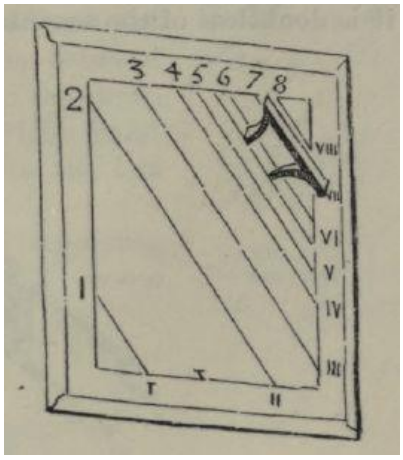


Fig. 9. Ross's sketch of the west-facing dial at Inveresk.

Fig. 10. The main entrance of Inveresk church showing the two dials.

Like the church at Cortachy, this church was built on the site of an earlier medieval church in 1806. It is not known though where these two dials originally came from. Today they are mounted on either side of the main entrance to the church (Fig. 10), obviously incorrectly as one is a south-facing dial (Fig. 11) whilst the other is west facing (Fig. 12)! The south-facing dial dating from 1735 with Roman numerals is much weathered and is badly flaking around the gnomon, whilst the west dial is in better condition and has both Arabic and Roman numerals. I must claim these two dials as my heritage as I have links to the 18th-century Handasydes of Musselburgh, although I still have to make a direct link to Archibald the maker of these dials, but I will keep trying!

Fig. 11. The south-facing dial at Inveresk today.

Fig. 12. The west-facing dial at Inveresk today.

Several miles south of Inveresk is the small village of Borthwick. Ross doesn't say much about this dial other than:

"*this neat dial* [Fig. 13], *dated 1707, is inserted in the south-west corner of the south porch or transept of the church, which probably dates from the fifteenth century".*

It might have been neat in 1890, but nothing much remains of it now other than the framework and the gnomon stubs (Fig. 14), but it still sits in its niche in the south-west corner of the transept.

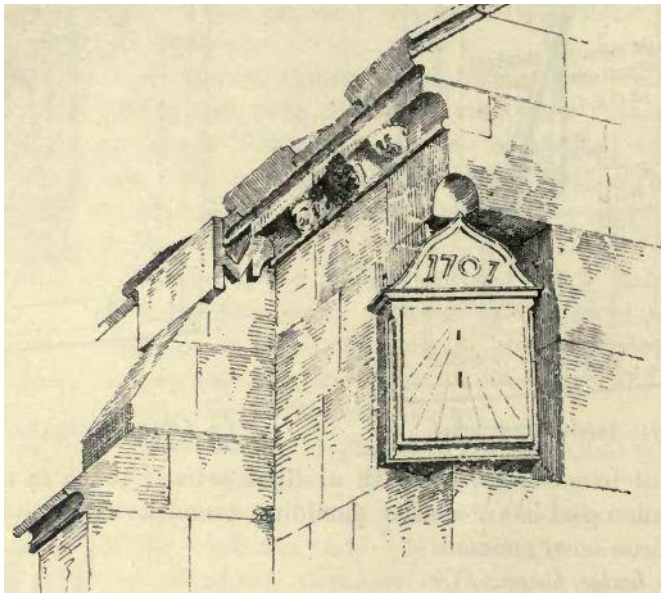


Fig. 13. Ross's sketch of the Borthwick dial.

Fig. 14. The remains of the Borthwick dial today.

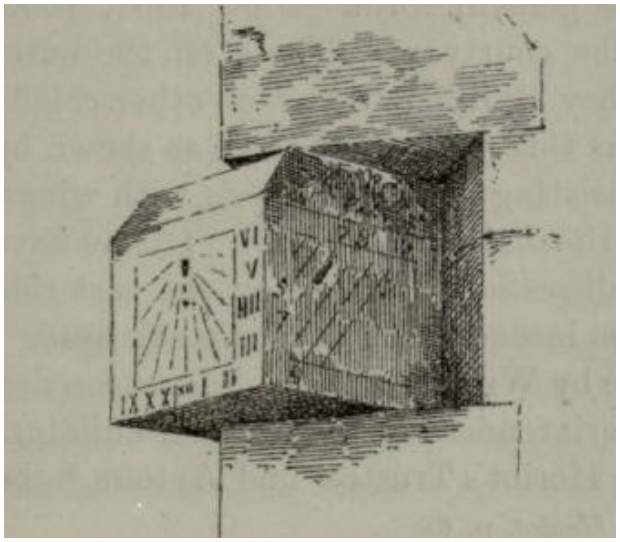


Fig. 15. Ross's sketch of the dial at Prestonpans.

Ross comments on the church at Prestonpans in East Lothian that:

"*on the south-west corner of one of the south aisles of this picturesque church there was a projecting angle dial* [Fig. 15]. *The aisle has been taken down since the sketch was made. The* Old Statistical Account *says that this church, with the exception of the steeple, which is much older, was rebuilt in 1774.*"

As Ross indicates, this dial is no longer there as the aisle on which it was mounted has been removed (in 1891). It is not known what became of the dial.

Some ten miles east of Berwick-on-Tweed lies the town of Chirnside. Of the dial on the church, Ross says:

"*the dial here* [Fig. 16] *is not unlike the one above referred to at Prestonpans, both in design and position; it bears the motto HOC AGE DUM LUMEN ADEST, and the date 1816; but the dial itself is older than the lettering. The church dates from the Norman period, and some work of that time is still left; but it has undergone many transformations and repairs, and on the north gable there is a stone inscribed REPAIRED 1705. This is a much likelier date for the dial than 1816, the date it bears. Dr. Stuart, Chirnside, states that there are several old dials in the village, and that a man named Dunbar was in old times in the habit of making them.*"

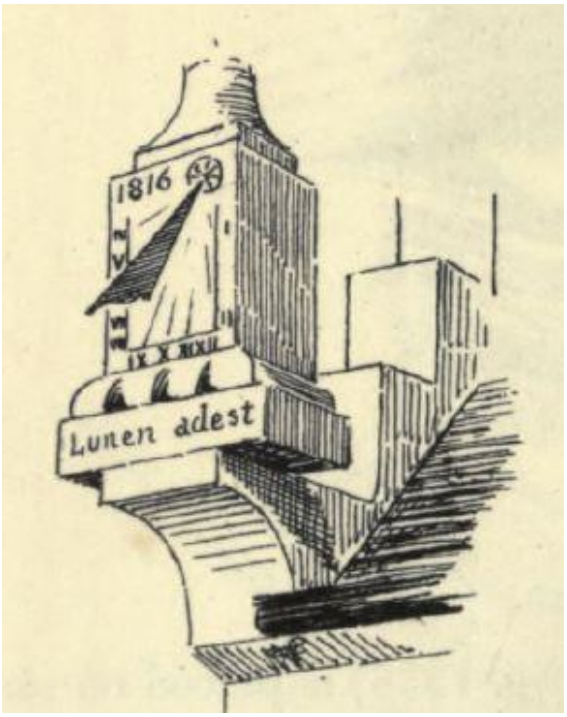


Fig. 16. Ross's sketch of the Chirnside dial with all the detail that is missing today.

There may have been several old dials in the village in Ross's day, but I have been unable to locate any of them other than this one on the church which has undergone significant changes since Ross's day. In 1904, following the death of Lady Tweedmouth and her burial in the churchyard, her husband Baron Tweedmouth built a hall, a new vestry and added a new tower to the church.

Fig. 17. The Chirnside dial today in its new position in a niche on the tower.

To facilitate the new tower, the dial was removed. Fortunately, unlike the dial at Prestonpans, a new position for the dial was created in a niche on the tower, where it remains to this day (Fig. 17). However, it is in very poor condition and the date can no longer be seen, as is the case with the numerals and hour lines. All that remains on this stone cube with two dial faces are parts of the motto, the gnomon roots and part of a sun motif.

Jim Clark, the Formula 1 racing driver who was killed in a crash at Hockenheim in Germany in 1968, is buried in the churchyard, and there were fresh flowers at his graveside at the time of my visit.

Auchterhouse is situated around ten miles north-west of Dundee, but its church is nearly two miles further away in the nowadays larger village of Kirkton of Auchterhouse. Ross says that:

"*this very interesting Gothic church has two dials—one, perfectly plain, on the south-east corner of the chancel; the other, on the gable* [Fig. 18]*, may appropriately be introduced here. It consists of a semi-cylinder sunk into the stone with a triangular hollow on each side. On the same gable occurs the stone with the date 1630.*"

Not much is left of the canted south-facing dial (Fig. 19) other than some very faint hour lines and the gnomon root. The other dial (Fig. 20) is still as sketched by Ross and some hour lines can be seen on the semi-cylinder.

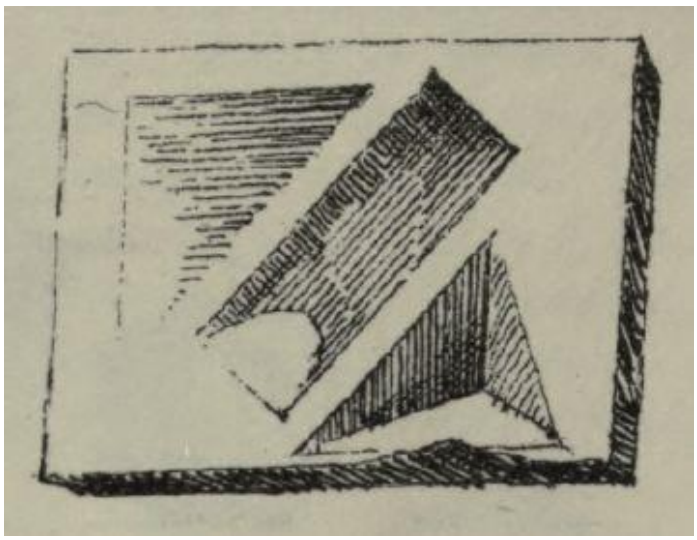


Fig. 18. The semi-cylinder dial at Auchterhouse as sketched by Ross.

Fig. 19. The canted south-facing dial at Auchterhouse today.

Fig. 20. The Auchterhouse semi-cylinder dial today.

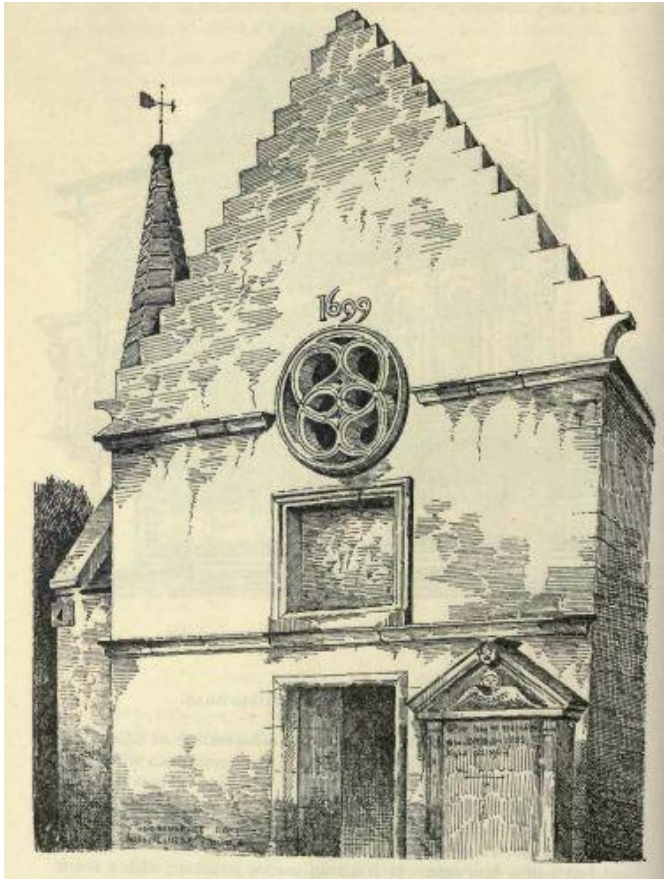


Fig. 21. Ross's sketch of Glencorse church showing the dial at the left-hand side.

At last Ross records a typical Scottish church sundial at Glencorse in Midlothian, wrapped as it is round the south-west corner of the church. He did not provide much detail though and it can only just be seen at the left-hand side of his general sketch of the church (Fig. 21). He says:

"*on the south-west corner of this abandoned church there is a very simple dial of this type* [dials with two faces on angles of buildings]. *The date on the Woodhouselee aisle of the church is 1699.*"

The church today is inside a private estate and is sometimes used for wedding ceremonies. The gates of the estate are kept locked and access was difficult as the owners never answered my e-mails. However, I was lucky as on the second time that I turned up hoping to gain access, the gate was open as a tractor was just leaving. When I explained why I was there, the driver wasn't keen but I eventually managed to convince him that I would be in and out within ten minutes.

The dial is in a poor condition today with only some of the Arabic numerals and hour lines visible including the cross patty for noon on the south-facing dial (Fig. 22). The west-facing dial isn't any better with only some Arabic numerals and the remains of a bent gnomon. But it has survived.

Fig. 22. The typical Scottish church dial at Glencorse wrapped round the south-west corner.

REFERENCES and NOTES

1. D. MacGibbon and T. Ross: *The Castellated and Domestic Architecture of Scotland,* David Douglas, Edinburgh (1892)
2. D. Cowan: 'In the footsteps of Thomas Ross. 1: Scotland's oldest sundials – the forerunners to lectern sundials?', *BSS Bulletin* 24(ii), 31–33 (June 2012).
3. D. Cowan: 'In the footsteps of Thomas Ross. 10: A mixed bag of sundials in Edinburgh', *BSS Bulletin* 27(i), 33–37 (March 2015).
4. Frank King comments that the "artistic touch" that Ross refers to appears to be a nodus. The dial plate in Ross's sketch clearly includes constant-declination lines, so a nodus would be required. Comparison of the sketch and the dial as it survives today shows that the sketch is not a very faithful representation. It shows eight constant-declination lines and the equinoctial line is not quite straight. Ross appears to have got tired when making this sketch. The morning hours are meticulously subdivided. All have half-hour and quarter-hour tick marks and many show tick marks at five-minute intervals. At XII there is clear evidence of a noon gap but, for the entire afternoon, only hour lines are shown, with no sub-divisions at all. Between the panel containing the constant-declination lines and the main chapter ring, there is a scale labelled with compass directions. The tick marks of this scale appear to radiate from the base of the horizontal strut that supports the gnomon. If we assume that the dial as a whole is direct south-facing then, *at an equinox*, this scale just about plausibly serves to indicate azimuth. The sun rises due east (when the shadow falls on the tick mark labelled 'E') and sets due west (when the shadow falls on the tick mark labelled 'W'). In between, the tick mark labelled 'S' is extra wide, echoing the noon gap in the hour scale. Most of the other azimuth tick marks and their labels in the sketch are somewhat awry but the surviving tick marks and labels of the dial appear to be correctly placed. This seems to be a most unusual azimuth scale, functioning as it does only two days a year.

dennis.cowan@btinternet.com

AN EARLY ENGLISH HORIZONTAL DIAL

JOHN DAVIS

The dial shown in Fig. 1 is a typical example of an early English horizontal: despite the fact that it was advertised as "cica 1800" (*sic*), I believe that it is more like c. 1590 and possibly a little earlier. It has all the features of the style of that period and so forms a handy checklist of the points to look out for.

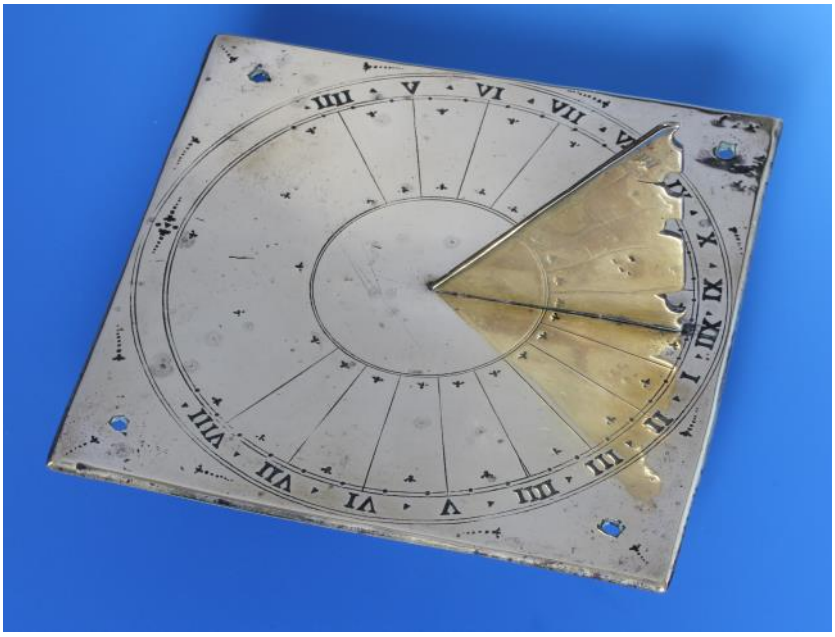


Fig. 1. Overall view of the early English horizontal dial.

The first point is that it is nominally square and quite small (156 mm or just over 6″), although smaller examples are common and sometimes thought to be windowsill dials – some may have been used like this but I have also found them on small pedestals in the gardens of Tudor houses. The dial plate has a thickness ranging from 2.3 mm to 2.6 mm and has clearly been hand hammered (see Fig. 2b). This is at the upper end of the range of thicknesses commonly found at this period – they can be as thin as 1 mm. The edges of the plate are nicely bevelled which adds to the impression that this is a dial made with some care.

It can be seen in the pictures in Figs 1 and 2 that the subject dial is highly polished. Conservators and museum curators will tell us that this is not a good idea and generally I would agree with them. In this case, however, the dial came to me already polished (and the back lacquered) but with numerous spots where something had been spattered over the surface causing quite deep pits of verdigris to develop. These were carefully polished out with metal polish on cotton-buds and cocktail sticks, taking care to avoid the engraving as much as possible and then removing all the residue afterwards. The surface was given a thin layer of

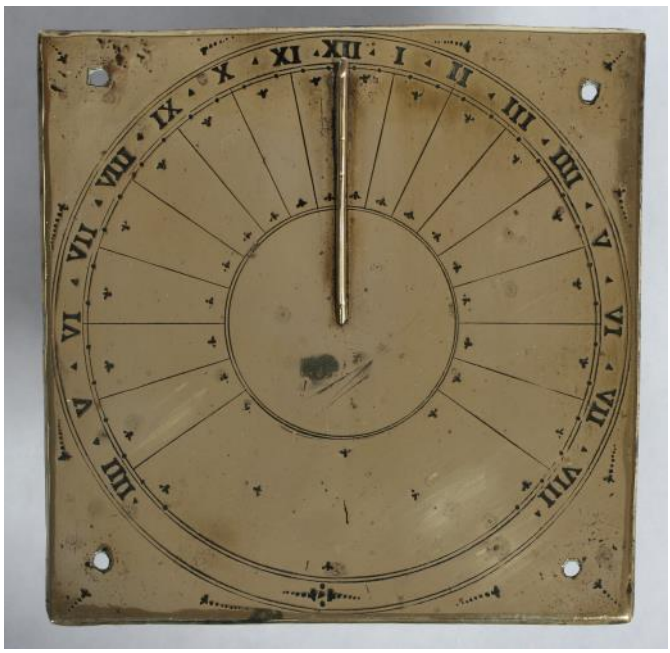


Fig. 2 (a and b). Front and back of the early English dial.

Fig. 3. Close-up of some of the punch-marks.

'Renaissance' microcrystalline wax to protect the newly-sensitised surface from acidic fingerprints. An alternative would have been to apply a chemical patination but I felt that this would not be authentic.

The next key feature is that the origin of the dial delineation is in the physical centre of the plate. This accords with the geometrical method of drawing a dial, based on a circle with E–W and N–S lines drawn on it. Only later (just before 1600?) did some makers realise that by offsetting the origin towards the south, the hour-lines could be made to occupy more of the usable area of the brass whilst still leaving room for a signature or other inscription in the gap between the evening and early morning hours.

Next, we find that the hour numerals are arranged to face inwards, like a clock, and that they are formed by punches, rather than by engraving. This somewhat limits the size of the numerals that could be used as large punches would not be easy to make and would require a very heavy blow to make a deep enough impression. Ownership of a set of punches, even a reduced set of I, V and X, would be in the hands of a professional and would take some skill to use properly. For this dial, the maker had at least two other punches available – a simple triangle, used to make the half-hour marks, and a rather strange shape (see Fig. 3) which looks like a club or a head-and-torso with outstretched arms, used decoratively. I have never seen anything quite like this shape before and Frank King has suggested that they are an attempt at a fleur de lys, which is certainly possible. It is debatable whether the circular dots were made with a further punch (or punches) or with a simple V-shaped drill bit, allowing dots of different sizes to be made. Fig. 3 also shows that the vertical shaft of the I has a slight taper to it: the wide section is at the top where it is used in VI but at the bottom in the adjacent VII. This strongly suggests that the maker put the punch down and picked it up again between these impressions and so was working his way around the dial.

The dial is divided firstly to hours with engraved lines and subsequently to halves with a triangle in the chapter-ring (the 'torso' marks do not seem to be accurately positioned for half-hours) and finally to quarter-hours by simple dots. Division to quarter-hours can be considered quite sophisticated at this period – many dials have only whole hours or perhaps halves. As a further nice touch, the timescale extends by three-quarters of an hour beyond the earliest/latest whole hour, giving a range from 3:15 am to 8:45 pm, allowing for the full length of the day on the summer solstice for a latitude of anything up to 56.6 degrees.

The dial is delineated from a single origin so no allowance is made for the thickness of the gnomon. The 'back hours' (i.e., those before 6 am and after 6 pm) are simple extensions of those in the other half of the dial and pass directly though the centre which is actually marked by a small hole, most clearly visible on the back of the dial. On many dials, the back hours are drawn rather inaccurately but here they are well-drawn.

The gnomon (Fig. 4) has a rather rounded knife-edge along its style which would have given accurate shadows except for a few minutes either side of noon. As it has a thickness of only 2.3 to 2.5 mm, the inaccuracy is minimised though it is noticeable that the dots for 15 minutes either side of noon are very close to the edges of the gnomon. The shape of the gnomon is basically a simple triangle with a fancy 'fimbriated' vertical edge. It is attached to the dial plate by the standard method of a pair of tenons hammered over on the underside: it is still firm after over four centuries. The latitude angle of the gnomon is around 51.5° which, being the latitude for London, is the value most commonly found.

The accuracy of the dial delineation was assessed by measuring the angles of each hour-line to the noon line, which is accurately perpendicular to the VI–VI line – not always the case! The quarter and three-quarter hour angles were also measured as a line could be drawn through the

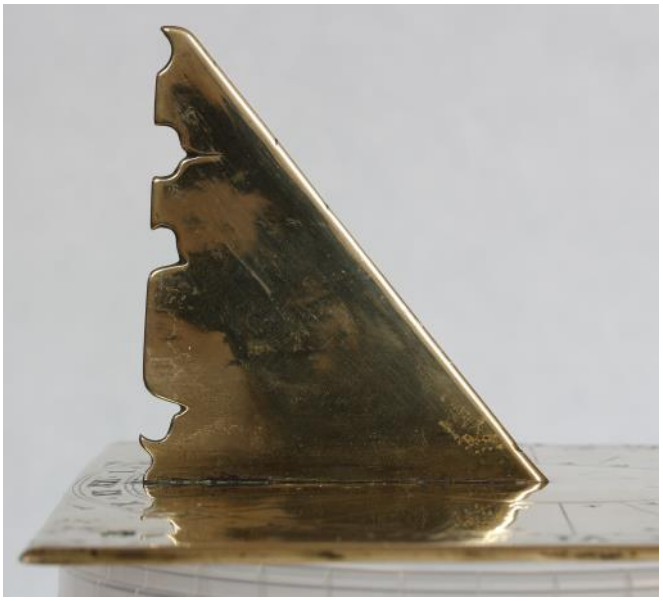


Fig. 4. Side view of the gnomon.

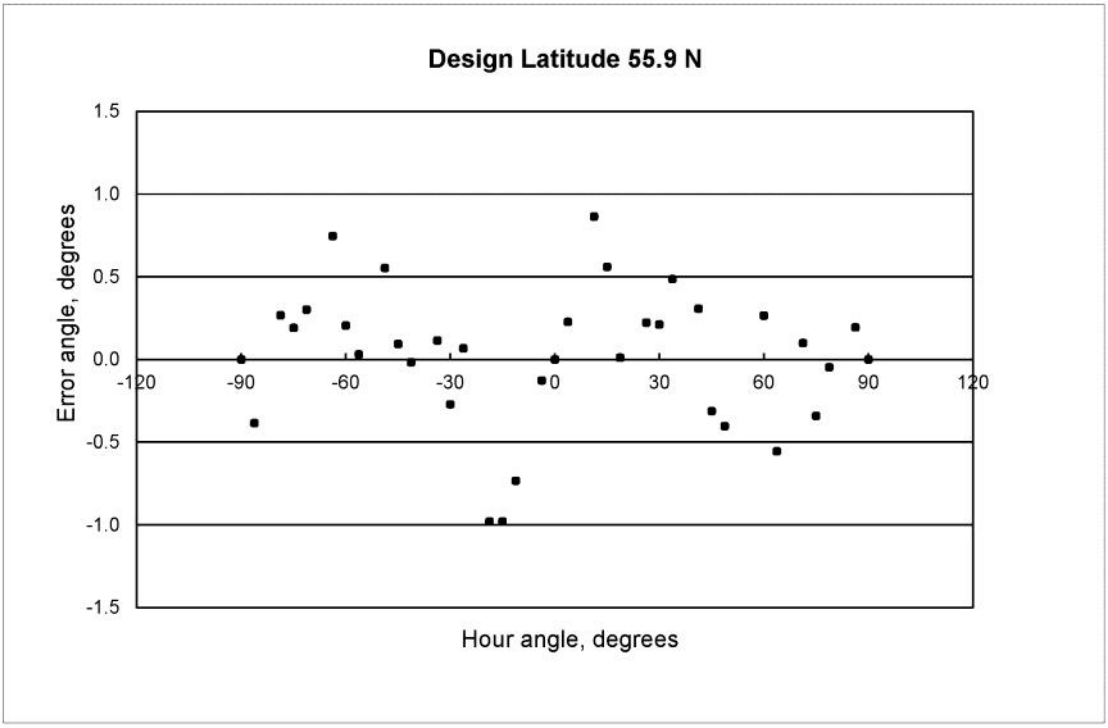


Fig. 5. Plot of the residual errors of the hour-line angles for a best-fit latitude of 55.9°.

centres of the appropriate dots, but the half-hour lines were excluded as it was not possible to determine the true intended position with any degree of confidence. Only the lines in the northern part of the dial (from VI am to VI pm) were included to avoid over-complicating the analysis and giving undue prominence to the extended 'back-hours'.

The measured angles were tabulated and compared with a set of theoretical angles calculated for a horizontal dial with a guessed latitude. The first guess was that of the gnomon, 51.5°, but that, rather surprisingly, gave a very poor fit with a standard deviation of all the errors (defined as [measured minus theoretical]) of 1.20°. By changing the guessed design latitude in a manner to minimise the standard deviation, a best fit of 55.9° was achieved with a much smaller standard deviation of 0.42°. (A very similar result was obtained by considering just the whole hours.) A plot of the error profile for this case is shown in Fig. 5 which displays reasonably random residual errors, though it is clear that the angles within an hour of noon do have a systematic error.

The mismatch in design latitude between the gnomon and the dial delineation is a puzzle. One possible explanation is that a dial originally made for, say, Edinburgh has at a later stage been re-gnomoned for London, ignoring the fact that the delineation will be in error. This would tally with the extended range of the timescale. The gnomon, though, gives every appearance of being original, including matching the alloy composition of the dial plate. Another suggestion is that the maker simply made an error in his laying out of the lines, either by selecting the wrong template or by picking the wrong spot on his protractor when laying off the latitude on the layout – all other lines being derived from this. There seems no way of knowing and it does not detract from the dial's interest in my view.

Fig. 6. Another, smaller, Tudor dial. The dial is much darker in real life – the photographic contrast has been adjusted for visibility.

As an aside, a smaller and in some respects even more typical Tudor dial is seen in Fig. 6. This example is just 135 mm square (approximately 5¼″) with a thickness varying from 1.2 to 1.6 mm and a gnomon thickness of 1.5 mm near the tip to 2.1 mm at the base. It is almost black in colour, has a cross to mark noon formed from two punched 'I's, and a small star for the half-hours. Both the gnomon and delineation are accurately for 51°. It was advertised as 'Victorian'!

john.davis51@btopenworld.com

GRAND GARDEN DIALS IN 1908

MARTIN JENKINS

In 1908, a book entitled *The Gardens of England in the Midland and Eastern Counties* was published, as part of the Arts and Crafts movement. It deals with aspects of garden design and contains many black and white photographs to illustrate various garden design features.[1] This article is based upon those photographs. The photographs were the work of two photographers, Mr W.J. Day and Mr R. Lincoln Cocks.[2] A sundial can be seen in fourteen of the photographs. Some of the dials are quite prominent in the photographs, whereas others are very much in the background, clearly dials but no detail can be determined other than that there was a dial there in 1908! It must be remembered that this book, with its illustrations, is now over one hundred years old and thus in many cases much change has occurred in the intervening years.

It is interesting to note that in 1908 the motorcar and electric lighting were in their infancy, powered flight had only been possible for five years, and most things we take for granted today didn't even exist as an idea. In addition, it would be another six years before war engulfed Europe. So these photographs are an invaluable record of another era when grand gardens were the prerogative of the privileged, staffed by teams of gardeners, and sundials were probably more common and prominent as grand garden features.

Many of the dials are not recorded in the BSS Register of 2015, not surprising given the intervening years between the photographs and the foundation of the BSS. A few are in the Register but whether they are one and the same dial recorded now I cannot confirm. Members who live closer to any of the properties may wish to make a visit and check the dial location, type, and date.

As an example of how things have changed, consider the dial photographed at Hemingford Grey (Fig. 1). Firstly, the book gives Hemingford Grey as being in Huntingdonshire whereas the BSS Register gives it as in Cambridgeshire. (Huntingdon is a market town in Cambridgeshire and was the county town of Huntingdonshire. It is currently the location of the Huntingdonshire District Council.) The BSS Register lists two vertical dials on St James's church but the dial illustrated in the book is a horizontal one in the herbaceous border of a country garden. The only other photograph of Hemingford Grey in the book is of the lily pond, so where is the garden and is the dial still there?

Another intriguing case is the dial at Clumber Park in Nottinghamshire. This was the home and estate of the Duke of Newcastle, now in the ownership of the National Trust.

Fig. 1. Hemingford Grey, Huntingdonshire.

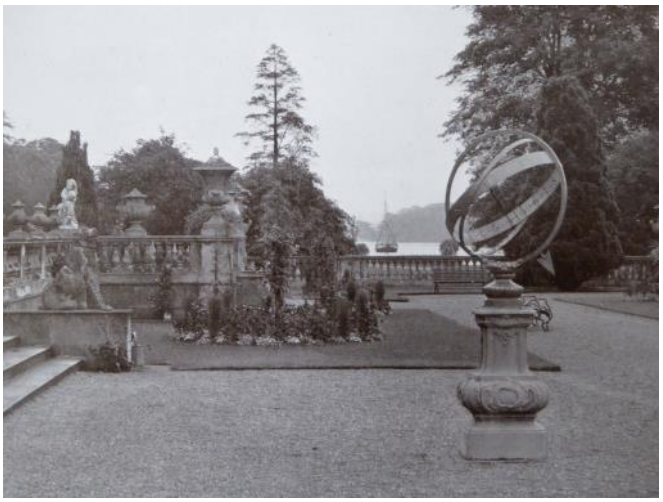


Fig. 2. Clumber Park, Nottinghamshire.

The dial listed in the BSS Register is for a horizontal dial in the garden by the lake made by BSS member John Davis to replace the original one stolen in 2008. But look at the dial photographed in 1908 (Fig. 2); it is certainly not a horizontal one but a magnificent armillary type. Apparently nothing now remains of the Duke of Newcastle's mansion; it was demolished in 1938.[3] So what happened between 1908 and 2008, did the armillary dial disappear with the mansion in 1938, and how did a horizontal one come to replace the armillary one?

Another large imposing dial not in the BSS Register is the one illustrated at Sudbrooke Holme in Lincolnshire (Fig. 3). Sudbrooke Holme is approximately five miles north east of Lincoln, and at the time of the photograph was the home of C. Coningsby Sibthorpe. This dial would

Fig. 3. Sudbrooke Holme, Lincolnshire.

clearly not be easy to carry away, so may possibly still be there?

The dial at Guy's Cliff(e) (Fig. 4),in Warwickshire is in the Register (SRN 7532), this type of dial having been extensively researched and reported by BSS member Roger Bowling.[4] However, the dial is not at Guy's Cliffe now but in a private garden in Hampshire, its third home! Guy's Cliffe house is a ruin today but the stone garden archway shown in the photograph of 1908 is still there. Guy's Cliffe was used as a hospital during the First World War and in the Second World War became a school for evacuated children. The estate was broken up and sold in 1947, and in 1952 the mill became a public house and restaurant. The stables became a riding school and the kitchen garden became a nursery, all of which still exist today. A toll house also stood by the road to the north of the restaurant but this was demolished in the mid-20th century. The new owner of the house intended to convert it into a hotel, but the plans came to nothing and the house fell into disrepair. In 1955 the house was purchased by Aldwyn Porter and the chapel leased to the Freemasons, establishing a connection with the Masons that remains today. The roof had fallen in by 1966 and in 1992 a fire got out of control and seriously damaged the building.[5] Guy's Cliffe is a listed building and

Fig. 4. Guy's Cliffe, Warwickshire.

English Heritage commissioned a survey of the property in 2001. In a section of that report there is a reference to the dial:[6]

"To the east the avenue is terminated by the gravel car park below the west facade of the House. Set at a slightly higher level than the avenue, this area corresponds to the early 19th century flower garden or Blackamoor Garden, named after a lead sundial in the form of a kneeling slave. The sundial, which does not survive in situ, occupied the focal point of the garden, from which segmental box-edged flower beds radiated."

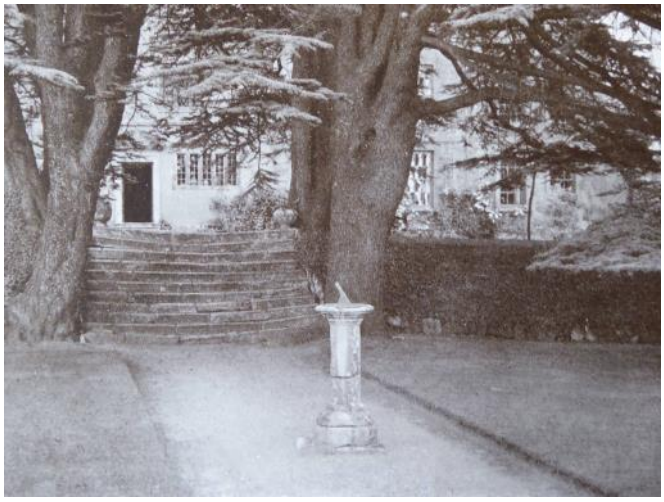


Fig. 5. Canons Ashby, Northamptonshire.

Canons Ashby in Northamptonshire, another National Trust property, is in the 2015 BSS Register (Fig. 5). According to the Register, the dial was still in good condition in 2011 but oriented incorrectly. However, the Register describes the dial plate as being octagonal but to me the 1908 photograph appears to show the dial plate to be circular. The Register describes the pedestal as being octagonal with a circular capital; the latter would be more in keeping with a circular dial than an octagonal one, and so is this the same dial? In addition, is the dial incorrectly orientated because it was moved from the tree cover location shown in the photograph?

Fig. 6. Compton Wynyates, Warwickshire.

There is most evidently a correlation between the survival of dials and their location. This is well illustrated by the dials at Compton Wynyates (Wyniates/Wynates) in Warwickshire. According to the 1908 photographs it would appear that there was a horizontal pedestal-mounted dial in the garden to the west of the house (Fig. 6) besides the two vertical dials on the east and west fronts of the property. The British History Online website does contain a document which refers to both vertical dials but not the horizontal one.[7] As vertical dials tend to be mounted relatively high up and to form part of the fabric of the building, they obviously tend to be left alone, whereas the poor old pedestal dial is easy prey to being shunted about. As an aside, the east-facing dial over the front porch is also featured on a Fry's Chocolate Trade card of 1924,[8] and in *Ye Sundial Booke* by Henslow although the latter places the dial in the wrong location but above the correct entrance, clearly a little bit of artistic licence used in the sketch![9] So again, what happened to the pedestal dial?

As regards Blickling Hall in Norfolk (Fig. 7), we have yet more mystery. Blickling Hall is a National Trust property and five dials are listed for it in the 2015 BSS Register: a modern horizontal dial by Brookbrae Ltd, another modern horizontal dial at Blickling Cottage, two analemmatic types, one by BSS member Ben Jones to the east of the hall and one by BSS member Frank King on open estate land, and a mystery vertical stone dial on one of the Dutch gables of the house. This vertical dial was first reported by BSS member John Davis in 1997 after a sighting on a television programme but was not seen by him on a subsequent visit in 2004. It is not easy to see in the 1908 photograph, but I believe that the vertical dial mentioned in the BSS Register could possibly have been on the inset stone panel of the leftmost gable in the photograph. The 1908 photograph of the south east front does, however, clearly show a pedestal-mounted dial on the edge of the formal garden, now called the parterre, centred to the walkway. Frank King suggests that this pedestal was moved to the 'Secret Garden', a few hundred yards away.

Fig. 7. Blickling Hall, Norfolk.

Fig. 8. Helmingham Hall, Suffolk.

It was on this old pedestal that the modern Brookbrae dial was mounted, but sometime on 6 or 7 February 2014 both the dial and the pedestal were stolen.[10]

In the same part of the country is Helmingham Hall in Suffolk but this one is even more difficult to identify (Fig. 8). There is very little detail to assist us in this instance, as the photograph was taken from quite far away and we have a choice of three BSS-registered dials at that location to choose from! The BSS Register describes a replica dial, a dial kept in the house and another one by the stables, the first and latter both mounted on substantial octagonal pedestals. Here it would help if the BSS Register gave a descriptive location for the dials, as maybe one location tallies with the photograph.

Next on this garden dial tour is Little Onn Hall in Staffordshire. The photograph is not reproduced for this one because the 1908 original was taken from a distance with the 'grand house and garden' view in mind and as a result it is very difficult to see small detail. However, there is quite clearly a pedestal on the terrace to the rear of the house, I think quite probably surmounted by a dial. The original house was apparently built on a medieval moated site in the 1850s by a Col. Ashton, passing on his death to his two unmarried daughters. The Misses Ashton embarked with gusto on ambitious plans for improving the house and grounds, as a result of which the Hall almost doubled in size. In the 1890s, the Ashton sisters commissioned Thomas Mawson, one of the most respected garden designers of his time, to produce a detailed plan for landscaping the gardens. His proposals were never fully implemented, not because they were unsatisfactory, but because his clients ran short of money. Apparently the gardens at Little Onn Hall are among the best examples of his work to be found anywhere in the country. Thomas Mawson's legacy at Little Onn Hall includes the terraces along the south and east aspects of the house which were intended to give elevation and form to the house.[11] It is on the south terrace where I think the dial was located. The dial is not recorded in the BSS Register; has any member visited Onn Hall?

Fig. 9. New Hall, Warwickshire.

New Hall in Warwickshire is the oldest inhabited moated house in England.[12] The property is now a hotel but still retains its 26 acres of grounds. To the rear of the house was a formal garden containing topiary and flower beds surrounded on three sides by the moat. Set amongst the planting was a pedestal-mounted dial (Fig. 9). From the photograph it looks as though the dial plate was quite large in diameter, as the capital is very prominent atop the stylish column. A Google Earth view now shows the garden to be the hotel's patio on which are the usual umbrellas and chairs but the garden is essentially still intact so maybe the dial is still there?

Moving on to Newstead Abbey in Nottinghamshire and there is another dial not in the BSS Register (Fig. 10). Again, this is a horizontal dial set on a robust plinth in a very well-kept parterre garden. This garden is known as the French Garden according to the Nottingham City Council website:[13]

"This has been known since Mrs Wildman's time as the French Garden. Every spring in the 1830s and 1840s her gardener laid new red and white sand directly onto the soil in intricate patterns like those of a knot garden. The Victorian novelist Edward Bulwer Lytton referred to this as Mrs Wildman's 'embroidery garden' and wrote to her in 1841 asking for advice on how to make one of his own at his villa in Fulham. In 1877 the Journal of Horticulture noted that the French Garden was a parterre 'laid out in quaint-shaped beds edged with box, the spaces between filled with white spar, blue slate, red brick dust, etc.' By 1916 all this was replaced by a simpler design of formal flower plots and gravelled walks around a central sundial."

Fig. 10. Newstead Abbey, Nottinghamshire.

Fig. 11. Renishaw Hall, Derbyshire.

However, if you look at the current website visitor information pictures, the dial has been replaced at some time by an ornamental well, so has the dial been relocated or is it lost?

Not so easy to see is what I believe to be a dial in the next photograph (Fig. 11). This is the south front of Renishaw Hall in Derbyshire. Renishaw Hall and gardens, home of the Sitwell family for four hundred years, is open to the public at certain times of the year.[14] Using a magnifier highlights a dial-type pedestal on the upper left terraced lawn. The dial is not in the BSS Register. Interestingly, since 1908 some sculptural features of the garden have changed significantly. For example, the finial-topped pillars each side of the steps, to the right of the photograph, have been replaced at some time by two statues. In addition, Google Earth imaging appears to show that the urn-topped

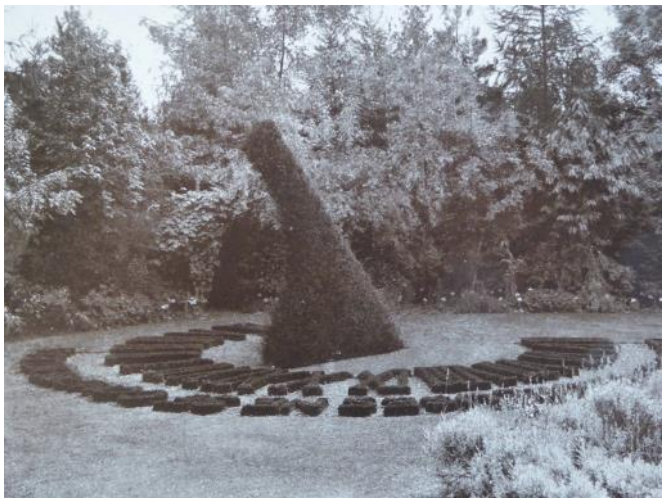


Fig. 12. Stone Hall, Essex.

water feature in the foreground is now where I suspect the dial was located on the upper terraced lawn. Maybe one of our Midland BSS members would like to check this out some sunny open day.

The dial at Stone Hall in Essex I am including only for completeness of the book's dial images as it was clearly ephemeral (Fig. 12). At the time of the photograph, Stone Hall was the home of The Earl of Warwick. The dial was obviously a gardener's challenge in the art of topiary and must have taken many hours of skilful work to get to the stage in the photograph. Unsurprisingly, it is not recorded in the BSS Register. My searches have revealed very little about Stone Hall. The Great Oakley website states:[15]

"Stones Green, described in 1870 as a 'village of sorts in itself', is a small hamlet lying two miles west of Great Oakley, but within the parish boundary. It is possible there has been a settlement here for 1,000 years but the name Stone probably comes from Richard Stone of 1563. During the 16th century a large mansion was erected and called Stone Hall and it is from this building that the village took its name. Stone Hall is today a modern home, nothing remains of the original."

Fig. 13. Tissington Hall, Derbyshire.

And finally we come to Tissington Hall in Derbyshire; this one is recorded in the BSS Register (Fig. 13) by BSS member John Lester in 1999. Tissington Hall and estate has been in the Fitzherbert family for in excess of five hundred years and is occasionally open to the public.[16] In one of the current visitor information images for the Hall a sundial is shown close to the house but the one in the 1908 photograph shows the dial to be on the terrace in the garden. Are these one and the same dial? I think it is a distinct possibility as both look similar and, in addition, match John Lester's description. If they are indeed the same dial, it was moved from its 1908 position, but why?

CONCLUSION

Old gardening books seem to be profitable hunting ground for images of old sundials; I can recommend the pastime to any BSS member, not gardening but reading about it! However, it would seem that the intervening years between 1908 and the present have seen the disappearance of many grand garden dials, certainly pedestal type, but why? Did dials go out of fashion and become part of 'bric-à-brac' trading, did many get accidentally damaged and subsequently thrown away, or did the scrap metal value of bronze become too attractive to thieves? There is still much scope for detection and adventure for those BSS members living in the region of these dials to further investigate and report back; who knows what dialling delights you may uncover in the pursuit of the foregoing?

ACKNOWLEDGEMENT

I would like to thank BSS Registrar John Foad for spending his valuable time checking the latest BSS dial Register's data for me.

REFERENCES and NOTES

1. Charles Holme ed.: *The Gardens of England in the Midland and Eastern Counties*, The Studio, London, Paris & New York (1908).
2. I have reproduced the images for completeness of the article. Because of the age and condition of the book I have had to attempt in most cases to improve the image to make it clearer for printing in the article. The original images were obviously the copyright of Mr W.J. Day and Mr R. Lincoln Cocks (it is not clear from the book which image was taken by which gentleman) but my research has failed to establish whether the publisher or its successor exist and as such I can only acknowledge the original publishing rights (Ref. 1) and image copyrights. I shall be only too pleased to issue a correction if further information is brought to my attention.
3. E. Grey et al., *Great Gardens*, Readers Digest Association Ltd, London, p. 165 (1988).
4. R. Bowling: 'Sundials and Slavery', BSS *Bulletin*, 25(iv), 34–40 (2013).
5. Guy's Cliffe, *Wikipedia.org,* accessed March 2015.
6. Study report on Guys Cliffe, entry No. 1001602 (2001), *www.english-heritage.org.uk,* accessed February 2015.
7. British History Online: *A History of the County of Warwick,* Victoria County History, London, 5, pp. 60–7 (1949), *www.british-history.ac.uk,* accessed February 2015.
8. Fry's Chocolate Trade Cards: *Ancient Sundials, series of 50* (1924).
9. T.G.W. Henslow, *Ye Sundial Booke*, Keliher & Co. Ltd, Kingsway, p. 108 (1914).
10. *http://norfolk.police.uk/newsandevents/newsstories/2014/february/stonesundialstolen.aspx*
11. House of Memories, *Country Life*, Dec. 8 2005, *www.countrylife.co.uk,* accessed March 2015.
12. D.V. Jones, *Walmley and its Surroundings*, *New Hall, New Hall Mill and the Ebrook*, Westwood Press, Ch. 11, p. 25 (1990).
13. Newstead Abbey, Nottingham City Council, *www.newsteadabbey.org.uk,* accessed February 2015.
14. Renishaw Hall, Derbyshire, *www.renishaw-hall.co.uk,* accessed February 2015.
15. Stone Hall information, *www.great-oakley.co.uk,* accessed January 2015.
16. Tissington Hall and Estate, *www.tissingtonhall.co.uk*, accessed January 2015.

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

NEWLY REPORTED DIALS, 2015

JOHN FOAD

Over 200 dials were newly reported in 2015. They range from the 17th century to the 21st, and as well as the normal verticals and horizontals, we have pillar dials and equatorials (a Pilkington & Gibbs Heliochronometer, a Cross dial and an 18th-century armillary sphere), multiple dials, and analemmatic ones. A selection is shown here as far as possible in date order.

My sincere thanks are due to Irene Brightmer, Ian Butson, Dennis Cowan, Maureen Harmer, John Lester, Christine Northeast, Margaret Ribchester, Jill Wilson and Tony Wood for their reports. I have omitted the location of a few of the dials, even where they are technically 'Open'. For more detail, please contact me.

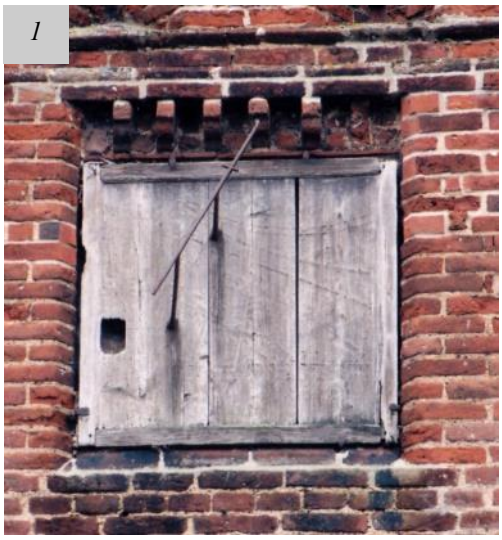
1. This wooden dial, with declination lines, is high on the chimney stack of the house constructed by Henry VIII in 1540 as a marriage settlement for his fourth wife. SRN 7770. Anne of Cleves House, Hamlet Road, Haverhill, Suffolk, Open.

2. Dated 1718, with inscribed and painted numerals. SRN 7737. St Michael and All Angels Church, Bassingham, Lincs, Open.

3. Although on a busy London street, this has eluded recorders until recently. A nice dial, well maintained, but the gnomon is unfortunately set too close to the plate. SRN 7774. 3–4 Church Row, Wandsworth Plain, Wandsworth, London, Open.

4. This church vertical dated 1747 would benefit from restoration. It is probably by the same maker as another newly reported dial, just three miles away at Burgh-le-Marsh (SRN 7767). Both have the initials 'T T' in a semicircle below the gnomon. SRN 7765. St Peter's Church, Thorpe St Peter, Lincs, Open.

5. This dial by John Bird stands unprotected in a country churchyard. It is heavily oxidised but the maker's name can still be read, and the motto "Watch for ye know not the hour". SRN 7850. Lincs, Open.

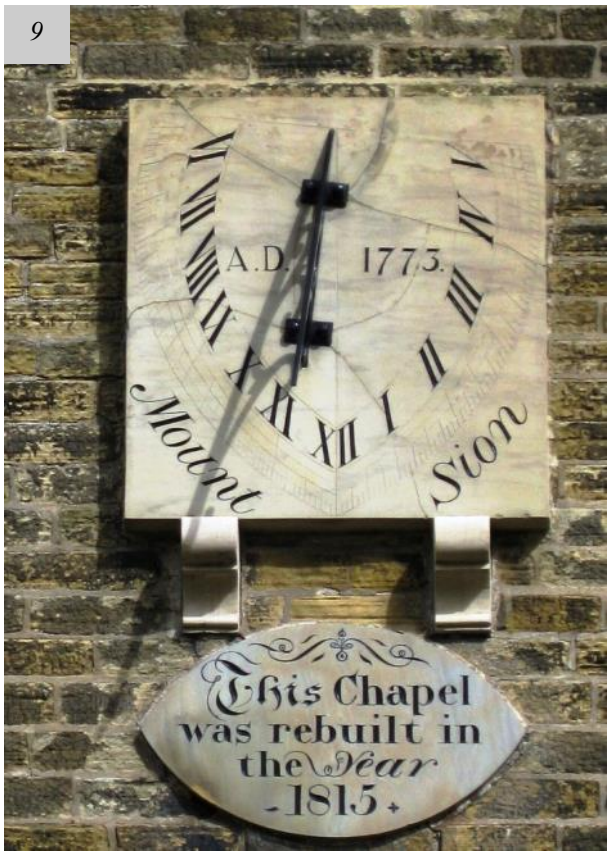

1


2

3


4


5



6. This 18th-century 3-ring equatorial was rescued from The Steyne House at Worthing before its demolition. SRN 7864. West Burton House, West Burton, West Sussex, Private.

7a and b. This wonderful pillar dial was the subject of Irene Brightmer's talk at Newbury last year. SRN 7872. Near Mold, Clwyd, Private.

8. An 18th-century dial by Nathaniel Witham, and one of only four by him in the Register. It was probably brought and installed here in 1930 when Clough Williams Ellis (of Port Meirion fame) made alterations and additions which changed the main façade of the house. SRN 7874. Abergele, Clwyd, Private.

9. Apart from the cracks, this dial is in remarkably good condition, with the hour divisions to five minutes still clear. Could the plate be marble? SRN 7863. Mount Zion Methodist Church, Upper Brockholes, West Yorkshire, Open.

10. A very fine dial of 1799, signed on the gnomon by Thomas Harrison, a Liverpool clockmaker with no dials previously attributed to him. Minutes are shown by transversals outside the chapter ring. The plate at the south has a Latin verse and its translation. SRN 7873. Denbighshire, Private.

11

12

11. Although you cannot see it here, this is a very finely engraved geographical dial dated 1836, with around 50 place names. It was made by the village schoolmaster, whose gravestone is in the churchyard, about 20 yards from his sundial. SRN 7696. Lothian, Open.

12. This dial is located just over 3° W, and the longitude is given as 'Time 12.85^{m} W', the correction for GMT. SRN 7711. High Street, Peebles, Borders, Open.

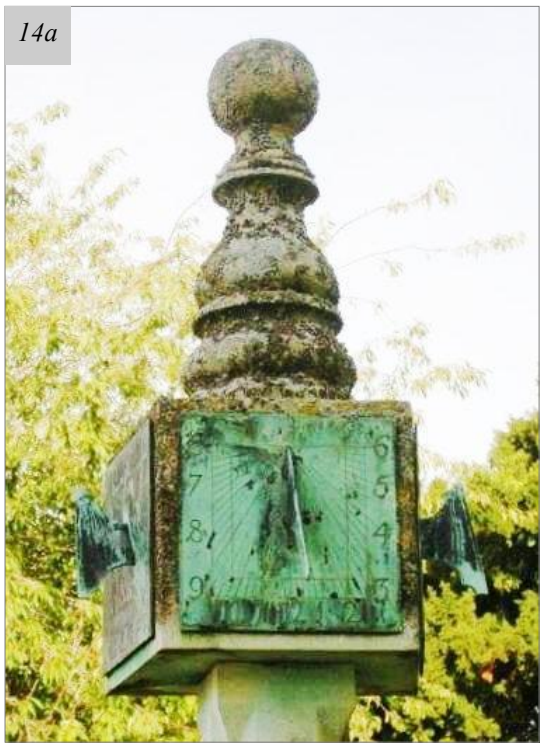
13a and b. An exquisite square dial decorated with thistles, gilding and coloured polished pebbles in the centre of flower heads which glint like jewels. It was installed for Queen Victoria's Diamond Jubilee, as shown in the pierced gnomon. SRN 7695. St David's Chapel, Stormontfield, Cambusmichael Road, Colenden, Tayside, Open.

14a and b. Possibly by Francis Barker, with dials on three faces of the cube, and an EoT table on the north side. It bears comparison with the rather grander dial at Eaton Hall,

13a

13b

14a



designed by Edwin Lutyens and made by Barkers, SRN 7678. This one is SRN 7722. Milton Hill House Hotel, Steventon, Abingdon, Oxon, Open.


14b


15


16


17

15. Long known of and sought for, and recently re-discovered after the shrubbery in the Royal Victoria Park at Bath had been cleared back! SRN 7809. Bath, Open.

16. A lead dial on the house that the architect H.G. Ibberson designed for himself in 1908, which may date it and provide its maker. There are interesting parallels (raised furniture and style of motto) with SRN 7241 at Heacham, two miles away. SRN 7755. The Gables Hotel, 28 Austin Street, Hunstanton, Norfolk, Visible.

17. Displayed proudly at a flourishing yacht club, this 1909 P&G heliochronometer looks good but has suffered from the salt breezes. The surface is worn smooth and almost all of the markings are lost. SRN 7753. The Royal Suffolk and Norfolk Yacht Club, Royal Plain, Lowestoft, Restricted.


18


19

18. Like dial 12 above, this has the longitude given as the GMT time correction, in this case 11^{m} 12^{s} W. I think we have just one other example of this usage, on a Lutyens house near Muirfield golf course (SRN 6932). SRN 7712. University Hall, Kennedy Gardens, St Andrews, Fife, Visible.

19. Only one of four plates remains on this pillar dial. SRN 7836. Streatham Park Cemetery, Rowan Road, Merton, London, Open.

20

21

23

20. An imposing dial with eight faces, this was once far grander, with a group of Atlases in lead above, carrying the world on their shoulders. The motto carved above the faces is “Set me right and use me well and I the time to you will tell”, common on hand-held dials but hardly appropriate for a massive fixture like this! SRN 7884. RAF Medical Rehabilitation Unit, Headley Court, Epsom, Surrey, Private.

21. A good example of a unique spiral design by John Singleton. The EoT is allowed for by rotation, aligning two concentric rings of offset month markers. SRN 7865. Bayford House Care Home, Rookwood, Berks, Private.

22. A large new analemmatic dial built on a peninsula of reclaimed land at the southern end of Lough Neagh. SRN 7856. Oxford Island, Lurgan, Armagh, N. Ireland, Open.

23. The dial commemorates the last significant battle of the Wars of the Roses, marking the end of the Plantagenet dynasty. The gnomon is in the form of a long halberd with a business-like end on which is held the crown of Richard III, killed in the battle. SRN 7703. Bosworth Field, Shenton, Leics, Open.

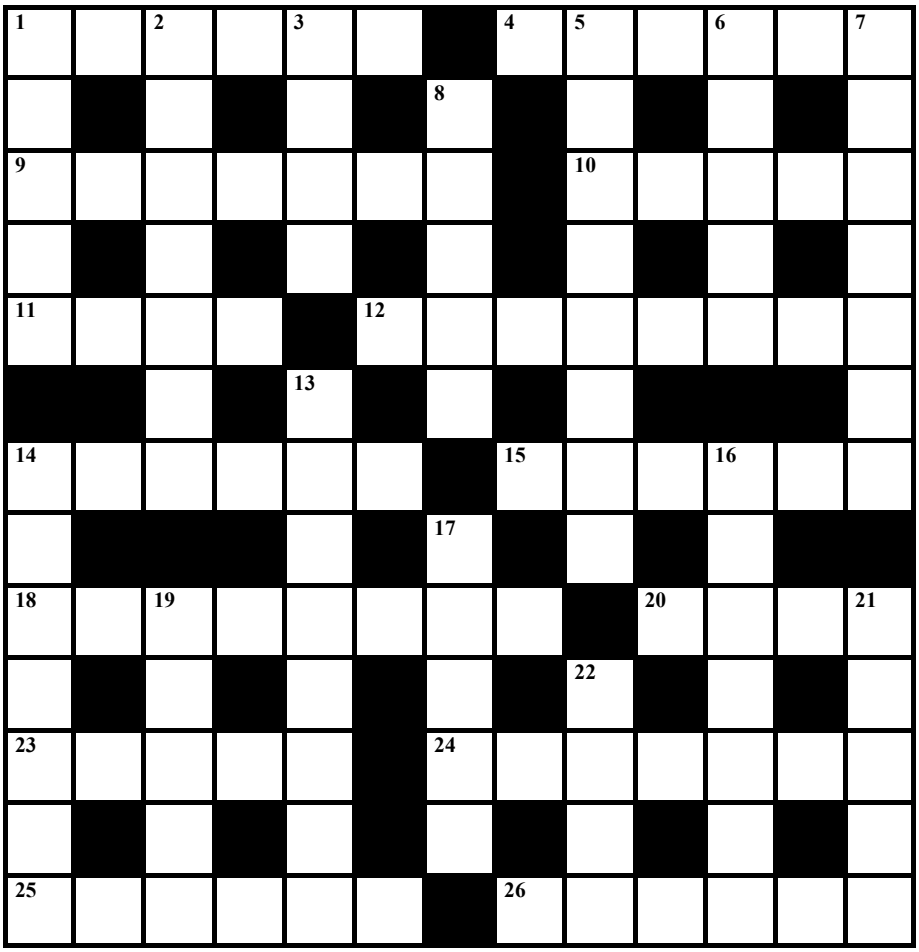
registrar@sundialsoc.org.uk

22

CROSSWORD PUZZLE

JOHN LESTER

Apart from five answers unconnected with dialling, all the others are mentioned in Jill Wilson's *Biographical Index* or John Davis's *Sundial Glossary*.



ACROSS

1 He introduced the prosthapaeretical arc (6)
4 It covers old dials. A paint job? (6)
9 A zone of latitude (7)
10 Thai, I moved to the West Indies (5)
11 Metal band with twisting force, we hear (4)
12 Figure of eight, it might provide man with a meal (8)
14 18th-century London maker of portable dials (6)
15 Bead on a card dial (it has no toes!) (6)
18 —— scale, a device for interpolating between scale divisions (8)
20 19th-century Edinburgh instrument maker (4)
23 Its first point is currently in Pisces (5)
24 Type of dial using sun's declination, altitude and azimuth to give the hour angle (7)
25 Assent to become least mad (6)
26 A degree in Latin (6)

DOWN

1 —— head, a type of Scottish dial (5)
2 Dial maker and author of *Horometria* (7)
3 We have just bare essentials for this 18th-century dial maker (4)
5 Event occurring around the first week in July (8)
6 Bone from Troy? (5)
7 Sighting arm of astrolabe (7)
8 Dial maker who patented a fire-engine (5)
13 —— dial, another name for a hemicyclium (8)
14 Primary units of angular measurement (7)
16 Helkiah ——, a 17th-century portable dial maker (7)
17 Early Arabic navigational instrument for determining the sun's altitude (5)
19 Type of card dial, a form of universal Capuchin dial (5)
21 Scandinavian books of song and prose (5)
22 Type of dial similar in concept to a cross dial (4)

johnws1@btinternet.com

BSS PHOTOGRAPHIC COMPETITION 2015–16

IAN BUTSON

Following on from the most recent photographic competition which was held in April 2014 at the Greenwich Conference on the 25th Anniversary of the Society, this competition took place after its usual break of two years. As in the 2014 competition it was decided that the results would again be determined by a vote from members attending the annual conference, instead of being marked as in the earlier competitions by a panel of selected judges, prior to the conference. This much simpler Conference Voting method has now been used on several occasions and has proved to be popular among members attending the conferences.

Delegates attending the conference were given the opportunity to consider the photographs, and by means of a simple vote to indicate their favoured choices for the first, second and third places in the competition. Three points were allocated for their first choice photograph, two points for their second and one point for the third. The photograph receiving the highest total number of points would then be declared the winner of the Conference Vote. Ballot papers had been prepared previously and made available for use in the delegates' conference pack. A ballot box had also been provided close to the displayed photographs, with all those attending the conference being encouraged to make their choices and enter their votes.

A total of 29 forms were submitted with votes being cast on 31 of the 37 photos on display, with the following results:

Following the allocation of points scored by the entrants' photographs, it was a considerable embarrassment to the organiser to find that one of his own entries had received the highest number of points, and would thus be voted as the winning entry. After the announcement of the results, the Chairman duly presented the first place certificate to the winner, again much to the winner's embarrassment.

As neither Darek Oczki, an overseas member, nor Margaret Ribchester, whose respective entries gained second and third places, attended the conference, their certificates were later sent on to them by post. Cash prizes of £20, £10 and £5 were also awarded to the three winners.

Thanks to all who submitted entries to the competition, as well as congratulations to those who achieved their winning scores.

Many thanks also to those who participated in voting for their favourite photos on display.

ian@tipsdial.orangehome.co.uk

First place	(24 points)	*Does anyone have the right time, please?*	Ian Butson
Second place	(19 points)	*Playing with the sun*	Darek Oczki
Third place	(13 points)	*How soon will it be lunchtime?*	Margaret Ribchester

The following photographs which made up the 'Top Ten' places are shown in the order of total points scored, having received from 12 points down to 5 respectively as:

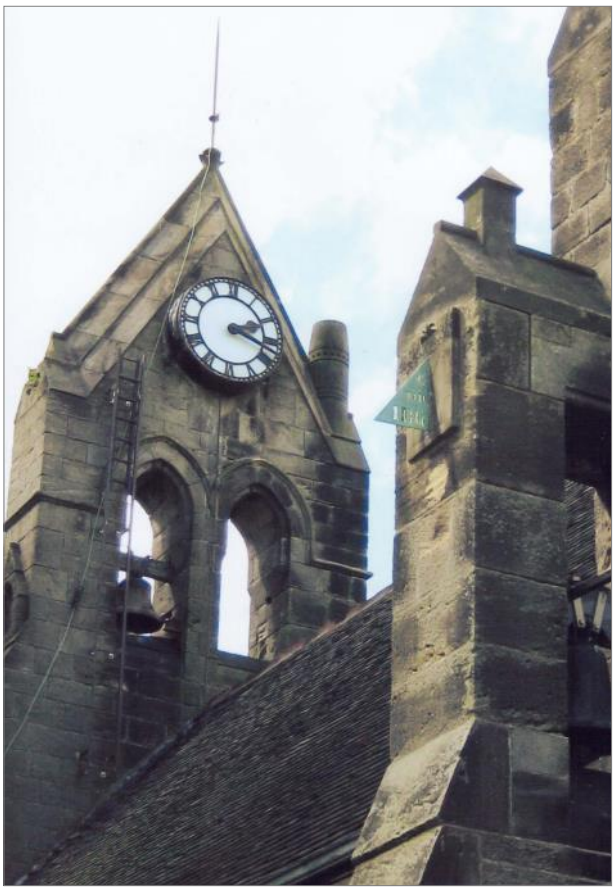
On the horns of an analemma	Mike Shaw	
Get ready to shut the shop as it's nearly time for lunch	Mike Cowham	
Mirror, mirror on the wall	Elzbieta Niedbalka	
Head to head in the battle of the Time Lords	Margaret Ribchester	
Old-timer meets old timer	David Payne	
Road	Valery Dmitriev	
Breakfast time	John Lester	Equal 10th place
A look at the sky	Darek Oczki	
Future ... present ... past	Darek Oczki	
The Orca sundial, Victoria, Vancouver Island	Doug Bateman	

First Place
Does anyone have the right time, please?
Ian Butson

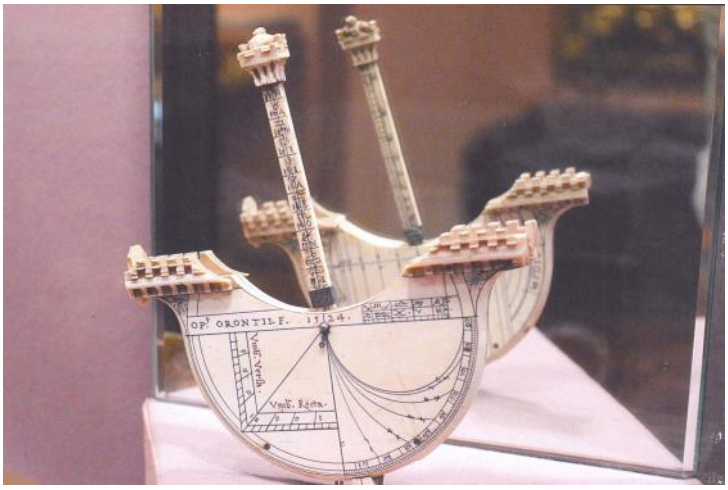
Second Place
Playing with the sun
Darek Oczki

Third Place
How soon will it be lunchtime?
Margaret Ribchester

Top Ten
On the horns of an analemma
Mike Shaw



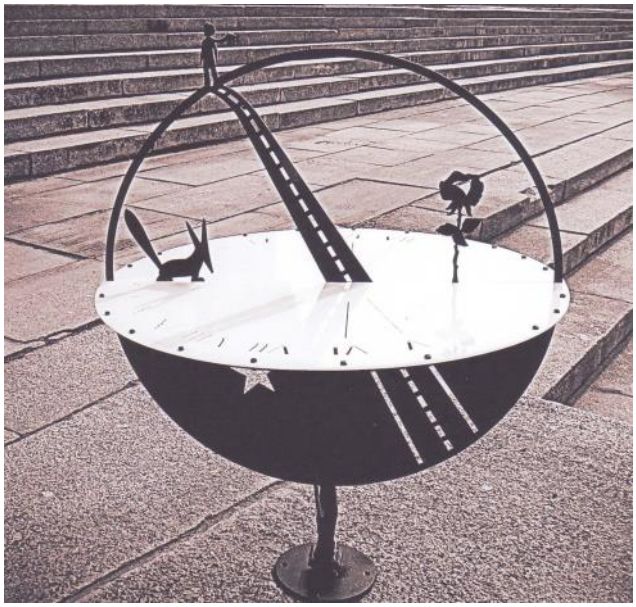
Top Ten
Head to head in the battle of the Time Lords
Margaret Ribchester



Top Ten
Mirror, mirror on the wall
Elzbieta Niedbalka

Top Ten
Old-timer meets old timer
David Payne

Top Ten
Get ready to shut the shop as it's nearly time for lunch
Mike Cowham

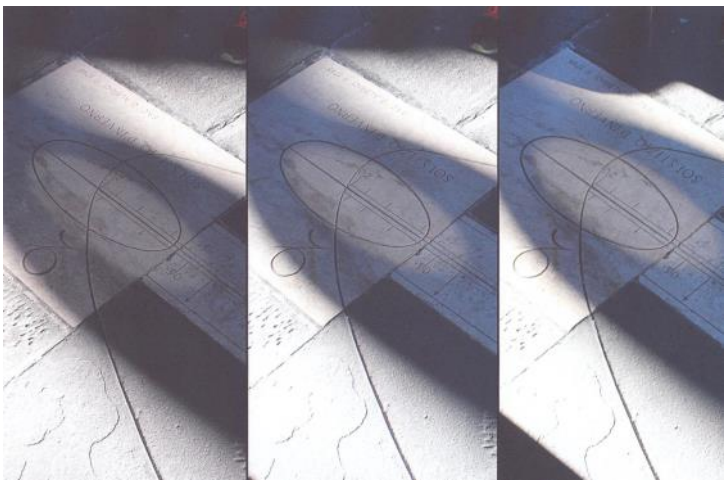


Top Ten
Road
Valery Dmitriev

Top Ten
The Orca sundial, Victoria, Vancouver Island
Doug Bateman

Top Ten
Breakfast time
John Lester

Top Ten
A look at the sky
Darek Oczki



Top Ten
Future ... present ... past
Darek Oczki

BSS ANNUAL CONFERENCE

Liverpool, 15–17 April 2016

John Lester and Alastair Hunter

This year's Conference, efficiently organised by Doug Bateman, Bill Visick, Mike Shaw and Liz and Chris Williams, was held at Jurys Inn, Liverpool, close to the River Mersey and adjacent to Albert Dock and the Wheel of Liverpool.

Friday 15 April

After an informal dinner, Mike Shaw gave an informative and amusing illustrated talk on the sights of Liverpool, with suggestions of what we might do during our free time on Saturday afternoon. This was followed by…

Geoff Parsons: *A Polar Dial in Darwin*

A polar dial was erected in 2015 in the Anzac Centenary Memorial Gardens in Darwin. Unusually, the hour band on this dial divides the year in half and the edges of the gnomon act as nodi to mark events such as the equinoxes, midsummer and midwinter, Anzac Day and the bombing of Darwin by the Japanese in World War II. It has an Equation of Time Scale. The speaker also described dials in Wellington (N.Z.) and Melbourne and a time-ball in Newcastle.

Kevin Karney: *Ascension Island Dial*

Kevin told the story of the British Antarctic Survey blacksmith who made a horizontal dial for Ascension Island. Surveyors there offered him the use of a complex instrument which would find true north for him. When this was brought on site it was discovered that nobody there knew how to use it. Happily there was, eventually, enough sunshine to do the job by traditional methods.

Saturday 16 April

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

Frank King: *Horizontal Equivalence*: *An Old Idea for New Diallists*

It was noted that, given an arbitrarily oriented plane, there is some magic spot, elsewhere on the Earth's surface, where the local horizontal is parallel to the plane of interest. Accordingly, one can design a horizontal sundial for the magic spot and transport it to the plane of interest where it should serve as a perfectly satisfactory sundial. There are three questions: where is the magic spot? how does one allow for any longitude offset and the associated time difference? and how does one swivel the finished dial on the plane of interest so that it has correct alignment? By means of worked examples, the speaker showed that all these questions could be answered without recourse to any mathematics.

Fred Sawyer: *Self-Orientation*

The validity of some of the sundials and sundial combinations regarded as self-orientating was examined, and it was pointed out that a new sufficient criterion for self-orientating dials was required. Dials or combinations which provide time and solar declination as outputs may be regarded as self-orientating.

These would include, for example, double horizontal dials, universal ring dials, the Foster Lambert dial with two gnomons, horizontal dials with declination lines, Pardies' 1771 sundial-making device, and August's skiostat. The efficiency of different dial combinations fulfilling this condition was examined. The most satisfactory combination was analemmatic combined with Foster south. Mention was made of the graphs produced by Henry Mills questioning characteristics of self-orientation which were shown to be invalid.

Mark Lennox-Boyd and Ben Jones: *Tetrahedron Cairn*

Two declining and reclining sundials were designed by Mark to be placed on adjacent faces of a tetrahedral cairn whose base was an equilateral triangle. The three faces bear the inscription MONTES AMABAT SEMPITERNOS 2015. The edge rising between the dials would be polar aligned. The slabs of Brandy Crag on which the dials were carved were attached to a steel frame which was mounted on a cylindrical stone pillar so that it could be precisely orientated before the rest of the cairn was built on a concrete foundation. The stone chosen for the dials proved very resistant to carving but the difficulties were eventually overcome.

Woody Sullivan: *Analysis of Year-Round Data for the 1702 Meridian Line in Santa Maria degli Angeli Church, Rome*

The meridian line was constructed by Francesco Bianchini on the orders of Pope Clement XI. Its aperture is elliptical, measuring 4.8 × 1.6 cm, and is set at a height of 20.3 metres. A calibrated brass

strip 37 metres long crosses the floor of the nave into the north transept. The church, once part of the Roman baths of Diocletian, was chosen for its geometry and solidity. The line has uses including the determination of the date of Easter, the length of the year, local solar time and the obliquity of the ecliptic (the tilt of the Earth's axis relative to its orbital plane). It is also an impressive item for a church to possess. The line has zodiac signs along its length. Near the summer end, there is a pattern of ellipses on the floor which relate to the daily path of Polaris. When these were first laid out, there was a second aperture through which Polaris could be observed using a telescope. The line from Polaris, through the second aperture to the floor, traces out an ellipse each day. As the centuries go by the size of this ellipse changes and, by noting the best-fit ellipse on the floor, one could estimate the current year. The second aperture is now blocked. In the spring of 2015 the speaker spent nine weeks with a party of undergraduate students from various disciplines who made observations of the sun-spot at solar noon. These were combined with other data obtained from various images available on the Web throughout the years 1996–2015. They obtained a value for the obliquity of the ecliptic of 23.455 degrees compared with Bianchini's result of 23.473 degrees in 1702. Their value for the length of the year was only 7 minutes off, and that for the time of the vernal equinox 27 minutes off.

David Brown: *Bulletin Update*

The *Bulletin* is the flagship of the British Sundial Society and it has been brilliantly edited by John Davis ever since June 2006. We should all be grateful to him for this splendid achievement. He is now assisted by a new editorial team consisting of Frank King and Christine Northeast with help from the speaker and others. Members were reminded that if the *Bulletin* were to maintain its past high standards, they would need to continue to provide it with good material.

Bill Visick: *Website Update*

The reason for past website faults was explained. The website was probably the most important route through which new members might be recruited and it should therefore contain some quite simple material. It serves also as a repository for items considered too trivial for the *Bulletin*. Its success can be judged by the fact that the number of hits has increased tenfold in the space of about three years.

After lunch there was free time to explore Liverpool, a World Heritage Site, and some members took advantage of Mike Shaw's offer of a guided tour of some of the sights.

At the Gala Dinner.

Tony Moss, Woody Sullivan, David Brown and Alastair Hunter, recipients of Sundial Awards scheme certificates.

Following the Gala Dinner, the Chairman, Frank King, introduced the new-style Sundial Awards scheme and the results were announced by Doug Bateman (see the article on pages 16–19). The four designers who were at the dinner were presented with their certificates, and they received a hearty round of applause.

Ian Butson, who had as usual organised the biennial Photographic Competition, confessed that he was a little embarrassed at having to announce that it was one of his own pictures that had received the most votes; this was an intriguing photograph of a collection of dials seen at an architectural and garden ornament reclamation centre. Entries from Darek Oczki and Margaret Ribchester, respectively, were placed second and third; see the article on pages 40–43.

The Chairman announced the results of the vote for Most Enjoyed Article 2015 (see elsewhere in this issue for more details).

The Chairman congratulates Ian Butson, winner of the Photographic Competition.

The Chairman presents the certificate for the Most Enjoyed Article of 2015 to Christine Northeast.

Auctioneer Mike Shaw and his assistant Geoff Parsons.

An auction, ably and amusingly conducted by Mike Shaw and Geoff Parsons, rounded off a most enjoyable evening.

Sunday 17 April

Mike Shaw: *Chadburns of Liverpool: A Sundial Search that Found a Toposcope*

Who would imagine that a simple request from the Registrar to visit a sundial shown on the map at Alderley on the Wirral might uncover a beautiful toposcope, a remarkable inventor, and a magical relocating house? Toposcopes of course often indicate the landmarks at popular viewpoints, but this one stood on a handsome pedestal at a private house, probably replacing an earlier

sundial, and was clearly inscribed '*WEC 1945*'. The initials led to the name of Chadburn's, a well-known Liverpool engineering firm, who in the nineteenth century had been opticians and scientific instrument makers patronised by HRH Prince Albert. They had once made sundials. William Chadburn the founder was a prolific inventor. In 1870 he patented the ship's telegraph, and he made steam whistles for the ships of the White Star Line including *Titanic*. By the time of World War II the company was involved in heavy engineering. The initials '*WEC*' turned out to be not those of a Chadburn but most likely those of the company solicitor, William E Corlett, who was presented with the toposcope on his retirement. And the magical house? It was at a different location on the map of the Wirral with a sundial built into one of the house walls. When the owner decided to move home, he dismantled this house brick by brick and relocated it to his new address complete with sundial. At Potsdam in Germany the house was copied and another one was built as a replica, with its own sundial again!

John Wilson: *The Sundials of Newstead Abbey, Nottinghamshire*

Oh, the woes of an ancient Priory! Newstead Abbey founded in 1163 has found itself at various times a home to the wildly erratic George Gordon Byron (Lord), a place for laying out endless

spectacular gardens, an heir to part of a marble column spirited out of the shrine to Aphrodite at the town of Piraeus by a soldier of the Crimea, and eventually a rather unwanted but beautiful property belonging to Nottinghamshire County Council. The marble column became a sundial which survives to this day. It was presented by the soldier, Captain Gore,

to his cousin Mrs Mary Webb who was a widow, in memory of her husband and of her son who died at Scutari, the town that was Florence Nightingale's base and is now known as Istanbul. The Webbs lived in Yorkshire but had once lived at Salisbury and Captain Gore probably commissioned the cathedral masons there to convert his newly acquired broken piece of a stone column into a sundial before presenting it to Mrs Webb. Mrs Webb's surviving son later bought Newstead Abbey and he must have been the person who brought the sundial with him. There are two other dials in the gardens. Mrs Webb had a family connection with Mrs Gatty who compiled her famous sundials book. The unpredictable Lord Byron begat the brilliant Ada Lovelace who created the computer science that practically runs our world today.

Fred Sawyer: *John Smith's Rectifying Days*

Woe to the scribe who writes down Sawyer's words! But this one started as a human story before it reached the expected maths. It was about a colourful chameleon character who earned his living in marvellous ways. He wrote a book on *painting sundials*, believing that books on *drawing sundials* must be intended for artists so they required a companion text. He published on Unitarian Theology and was required to recant his beliefs by parliament, his books were banned and burned. He announced a universal remedy that cured all named and unnamed ills, and might have made his fortune, but his prescribed remedy was water. And he wrote a treatise on clocks. To our minds his approach was unorthodox; unconstrained by convention he applied his imaginative thinking to a proper use of the equation of time, as he saw it. Far better he said to keep the clock in time with the sun rather than keep the clock 'correct'. In other words he did not believe you should use the equation of time to regulate the clock for twenty-four hours of mean time; he believed the clock should read solar time all the year round. His concept of Rectifying Days required you to re-adjust your clock by a prescribed number of minutes on defined dates, and your clock would then read solar time with known accuracy. It turns out that his published set of adjustment tables, and his procedure for adjusting only on his ten Rectifying Days of the annual calendar, actually works. He even includes a procedure for what to do if your clock stops or needs re-setting. Except for some discrepancies in the calculations, his methods are able to keep clock time within three and a half minutes of solar time for the whole of the year.

Derek Humphries: *Mapping for Diallers: A Simple Look at Online Applications and the Ordnance Survey National Grid*

This newcomer to the Society was given a warm reception especially on his first visit to the annual conference when he bravely offered to stand up and speak. With expert knowledge of cartography and of IT, and with a personal inclination towards precision in many things, he had been mildly surprised to find references to a permanent object like a sundial wandering around its geographic location by as much as half a kilometre on the map. An overview of current computer applications followed, helpful and informative, explaining and illustrating many of the features of Streetmap, Bing and Google. These use information from a variety of datasets, in the UK mainly from the Ordnance Survey, and combine with aerial and street level image information. Input and output of coordinates is normally possible, plus distance and angle. For an example he showed the aerial view of Petts Wood in south-east London, zooming in to find the actual position and coordinates of the sundial memorial to William Willett, who campaigned for British Summer Time. The Earth System Research Laboratory (ESRL) in the United States provides sun position information. Another site WheresThePath shows a split map/aerial view which is excellent for outdoor activities.

Alastair Hunter: *A Scottish Sundial Holding Secrets*

Writing up your own talk feels reminiscent of filling in your own staff appraisal form at work although without your employer's urgent insistence. The content of the talk, which was about looking for the name of the beautiful lady in stone who forms the pedestal of a Scottish sundial, owes most to the inner urges of curiosity and blunt persistence. None of the information available from respected researchers in the field, or government historic records, or tour guides at Lennoxlove, which is where the sundial stands, appeared to explain why there was a lady there or who she was. In fact it all seemed to be inconsistent. The key was discovered in the name 'Lennoxlove' itself, which means 'With love from the Duchess of Lennox to her cousins the Blantyre family in Scotland'. This name was given to the house when it was bought in 1703 after she died. The Duchess had lived her life at court in London as a lady of high fashion and great beauty. She had acquired considerable wealth which, lacking family of her own, she wished to distribute to her Scottish cousins. She also instructed that a wax effigy be made in her likeness to stand at Westminster Abbey. This effigy along with the portraits painted of her, and the wardrobe of her clothes, provided ample material for a sculptor to carve her statue. It was probably done in the nineteenth century, and the statue was incorporated into an original sundial from the seventeenth century, forming the lovely piece we see today.

Woody Sullivan: *A Wearable, Portable Sundial that Tells both Time and Compass Direction*

From the man who designed the sundial that is currently aboard the Spirit and Rover vehicles exploring the planet Mars one would expect no less than an out-of-this-world project, and so it proved, even if engagingly eccentric. It was surely Yogi Bear who first publicised the portable sundial, or perhaps that is apocryphal, but there have been many others. There is a whole range of sundial devices you can buy and wear on your wrist, and some of them will tell the time. You can wear a sundial T-shirt, and you can buy a ring for your finger with a real pop-up sundial on top. But an extra-terrestrial scientist designer looking for fashion accessories will have none of these, he needs a tattoo! This is wearable and durable, and will definitely impress. The sundial bit is harder though. It was going to require suitable curves to function as

an altitude dial, and considerable development. The practical construction, scaling, colour coding, and aesthetics all would need attention, not to mention working at more than one latitude, incorporating four birthday dates, adapting as a moon dial, and dimensioning to fall within the anthropometrics of the human forearm, which must first be measured. In the final design the vertical gnomon is mounted on a wrist bracelet along with its own spirit level. There is no need for a compass but if you use it as a compass it will get you home, except at night!

The Andrew Somerville Memorial Lecture

Seb Falk: *Instruments of Medieval Astronomy*

From the lips of a medieval historian working in the Department of History and Philosophy of Science at the

University of Cambridge, Seb's talk was bound to inspire and illuminate us all. In his imaginative way he showed us our modern world, which pollutes the light of the skies, in the manner that the ancient astronomers would have seen the skies of their own world. Superimposing comparable night images of London and Mongolia we saw the familiar skyscraper skyline overarched by myriad stars. In medieval times they not only saw those stars but had endless time to observe them and discover the cycles of the constellations. Even with a simple dioptre tube, with no mirrors or lenses, they saw the slight movement of Polaris about the polar axis and could bisect it to find position. The astrolabe was an instrument for teaching, understanding the cosmos, and social prestige, as well as for measurement. It was also regarded as an aid for monastic contemplation, helping one get closer to the mind of God. The plate becomes a stereographic projection of the heavens showing horizon, zenith, pole, altitude and azimuth. The rete, meaning net or spider's web, positions the stars. This was a complex instrument, which was explained in texts, for example by Chaucer, and in illustrative cartoons. The alidade permitted sighting of the sun from which to determine the date, a typical purpose for the Islamic world, or to determine Saints Days in the Christian calendar. The alidade was used for finding the time, when the date was known, and was sometimes elaborated with a conversion scale showing equal and unequal hours. The historian must be wary about surviving examples because this extra scale was often discarded or replaced when the unequal hour system was abandoned. Some instruments were highly ornamented, introducing symmetrical and tulip forms into the design of the rete. One such was probably made for Queen Elizabeth I. These were prestige objects, like latest-model smartphones today, embellished with features far exceeding mere practicality. Other instruments were valued in the realms of astrology, an equally regarded discipline to astronomy at the time. These would show the positions of the sun, moon, planets and astrological houses. They would be consulted for favourable positioning of the celestial bodies before carrying out medical treatments. An image of the beautiful astrolabe made in 1558 by Giovanni Domenico Fecioli of Bologna, held at the Museum of the History of Science in Oxford, has now migrated across the seas and provides the watermark on page twenty-one of New Zealand passports. Discussion at question time was thoughtful and lively. To Seb's relief no doubt this was not an oral examination, but it covered his doctoral thesis, and we enjoyed all of his answers.

Photos by Mike Shaw and Bill Visick

MINUTES OF THE 27th BSS ANNUAL GENERAL MEETING
Liverpool, 16 April 2016

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

This was the Society's first regular, as opposed to inaugural, AGM held under its new constitution as a Charitable Incorporated Organisation.

1. **Minutes of 2015 AGM**

   The minutes of the 26th AGM, held at Nottingham on 11 April 2015, were published in the June 2015 *Bulletin*. As no comments had been received by the Secretary, they were taken as read.

2. **Receive 2015 annual statement of accounts and the 2015–16 trustees' annual report**

   Both documents were circulated to all members in the March 2016 *Bulletin.* No comments were made on either, and both the accounts and report were taken as accepted.

3. **Election of a trustee**

   Chris Lusby Taylor and Bill Visick retired by rotation. The latter offered himself for re-election. On behalf of the Society the Chairman thanked Chris Lusby Taylor for his years as a trustee.

   Bill Visick was elected to the office of charity trustee.

4. **Appoint examiner for 2016 annual statement of accounts**

   Independent Examiners Ltd was reappointed.

5. **AOB**

   No other business was raised.

Secretary
5 May 2016

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 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 David Brown
Gibbs Orchard, Sutton Rd
SOMERTON
Somerset, TA11 6QP
Tel: 01458 274841
david@davidbrownsundials.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

Conference Team conference@sundialsoc.org.uk

Help and Advice HelpAndAdvice@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
Stonegate
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