BSS Bulletin 31(i)

The British Sundial Society

BULLETIN

VOLUME 31(i)
March 2019

March 2019

GUIDELINES FOR CONTRIBUTORS

1. The Editor welcomes contributions to the *Bulletin* on the subject of sundials and gnomonics and, by extension, of sun calendars, sun compasses and sun cannons. Contributions may be articles, photographs, drawings, designs, poems, stories, comments, notes, reports, reviews. Material which has already been published elsewhere in the English language, or which has been submitted for publication, will not normally be accepted. Articles may vary in length, but text should not usually exceed 4500 words.

2. **Format**: The preferred format for text is MS Word or text files, which should be sent by email to *editor@sundialsoc.org.uk*. Material may also be sent on CD .

3. **Figures**: Pictures should be sent as separate jpg (do not over-compress) or tif files – do not embed them in Word files. For email attachments, do not exceed 10 Mbytes per message. Each figure should be referred to in the text, and a list of captions for the figures should be included. Captions should be sufficiently informative to allow the reader to understand the figure without reference to the text.

4. **Mathematics**: Symbols used for the common dialling parameters should follow the conventions given in the Symbols section of the *BSS Glossary* (available at *sundialsoc.org.uk/discussions/glossary-a-z/*). Consult the Editor if in doubt or for help in laying out equations.

5. **Notes**: The *Bulletin* does not use footnotes. Where additional information is required, each note should be numbered as a reference with a superscript number. For very long notes, use an appendix.

6. **References**: Sources are referred to in the text by a superscript number. They are listed in numerical order under the heading 'References' (or 'References and Notes') at the end of the article. The *Bulletin*'s convention is as follows:

   For books: Author's name; title of book in italics; name of publisher; place of publication; date in brackets.
   For papers and articles: Author's name; title of article in single quotation marks; name of journal in italics (this may be abbreviated); volume number in Arabic numerals underlined; first and last page numbers; date in brackets.

   Examples:

   A.E. Waugh: *Sundials, their Theory and Construction*, Dover, New York (1973).
   J. Davis: 'The Zutphen quadrant', *BSS Bulletin*, 26(i), 36–42 (March 2014).
   A.A. Mills: 'Seasonal hour sundials', *Antiquarian Horology*, 19, 142–170 (1990).
   W.S. Maddux: 'The meridian on the shortest day', *NASS Compendium*, 4, 23–27 (1997).

7. **Acknowledgements**: These should be as brief as is compatible with courtesy.

8. **Address**: The email address of the author should normally be given, right-aligned and in italics, at the end of the article unless the author, when submitting the article, expresses a wish that this should not be done. Authors may, if they wish, supply a very short biography and photograph (see previous editions of the *Bulletin* for examples).

9. **Copyright**: The copyright of an article is held by the author. The copyright of photographs belongs to the photographer; authors who use photographs other than their own must obtain permission and should acknowledge the source in the caption. Authors who re-publish elsewhere material already published in the *Bulletin* are asked to refer to the *Bulletin* in the re-publication.

editor@sundialsoc.org.uk

***Front cover**: DIY garden heliochronometer, Mark III, whose design and construction are described by Brian Huggett in his article on pages 26–32.*

***Back cover**: On page 40, Richard Newman of Illinois tells the story of how he purchased this dial on a vacation in Scotland, and caused some bemusement amongst security staff at Heathrow airport.*

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 31(i) - March 2019

CONTENTS

EDITORIAL

In common with all March issues of the *Bulletin* in recent years, this issue is, in part, formal material that our Constitution requires members to have prior to each year's AGM. Accordingly, you will find the Annual Report by the Trustees and the Annual Accounts towards the end.

Happily, the bulk of this *Bulletin* is our usual mix of items relating more directly to sundials. We begin with another article by our Greek friends Andreas Galanakis and Efstratios Theodosiou aided by Martin Jenkins.

It has become something of a custom for the March issue to include an annual Dial Dealings article by Mike Cowham and the photographs are every bit as splendid as usual.

Unusually, we have two Book Reviews and, for some unaccountable reason, I particularly enjoyed reading the review written by Ben Jones on page 39.

Very sadly, Jill Wilson died in December and there is an excellent obituary by Doug Bateman on page 17.

I found it most interesting to look up a Reader's Letter that Jill published in 2008.[1] She had been inspired by some comments that Chris Williams had made about regional variations in the distribution of mass dials and she had pondered the significance of local geology. Noting that some stone is not very suitable for cutting mass dials, she wrote: 'Like Chris, I regret that there is no full record of churches surveyed but found to have no extant mass dials.' Intriguingly, just a week ago, I heard our new mass dial specialist, John Wilson, stressing the importance of explicitly recording zero scores when surveying a medieval church for mass dials and finding none.

Frank King

1. Jill Wilson: Reader's Letter, *BSS Bulletin,* 20(iii), 141, 151 (September 2008).

ALEKTRYON

ANDREAS GALANAKIS, EFSTRATIOS THEODOSIOU AND MARTIN JENKINS

Some of the BSS membership will no doubt remember Andreas Galanakis from previous articles about sundials[1] that he has made at his workshop in Athens. In July 2017 Janet and Martin Jenkins again visited Andreas and his wife Sofia to discover that he has produced another sundial inspired by Greek mythology. Once again, Andreas has used stainless steel as the material for this new work which he calls 'Alektryon'. The idea behind this new dial is as an educational and inspirational tool to engage with students. It is intended both to educate and to inspire (Figs 1 and 2).

Martin Jenkins

Preamble

λαμπρά μὲν ἀκτὶς Ἡλίου, κανὼν σαφής, ἔβαλλε γαῖαν…

(Bright shone the sun, one levelled line of light, upon the world…)

Euripides: *The Suppliants*[2]

What does the tragic poet Euripides mean in his play *The Suppliants* when he uses the words κανὼν σαφής (literally a long-levelled, unerring rule of light) for sun rays, words that transcend the mind to reflect on irrefutable rule and unbreakable law? A sundial can possibly provide an explanation.

Who was Alektryon?

The myth holds that Alektryon was a friend of Ares, the god of war. Ares, who was in love with Aphrodite, Hephaestos's wife, charged Alektryon to stand guard outside while he, Ares, indulged in love with Aphrodite: Alektryon was to warn Ares before Helios, the sun, rose and woke up Hephaestos.

However, inevitably the time came when Alektryon fell asleep and Helios rose and woke up Hephaestos, who caught Ares and Aphrodite in bed. Filled with rage, Hephaestos tied them up with invisible bonds and called the pantheon of gods to see and ridicule them. The love affair resulted in the birth of a female child, Harmonia.

After failing to warn him, Ares summoned Alektryon and summarily condemned him never to sleep again on a bed but announce before all the arrival of the sun in the morning by turning him into a cockerel, an 'alektryon'. Ever since, alektryons never lie down, they sleep standing and meet the sun crowing (Fig. 3). In this manner, the bird-shaped sundial acquired its name.

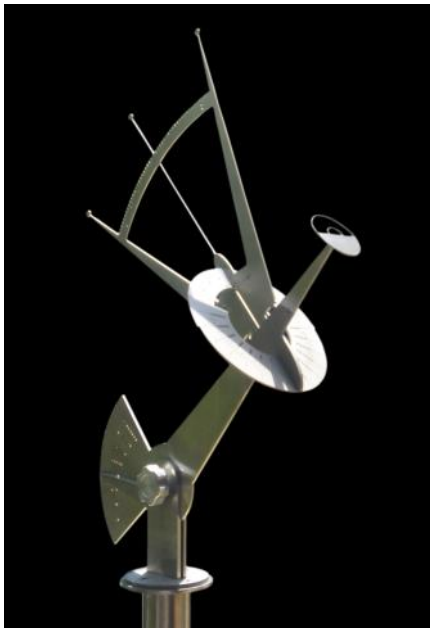


Fig. 1. Alektryon.

Fig. 2. Alektryon's shadow.

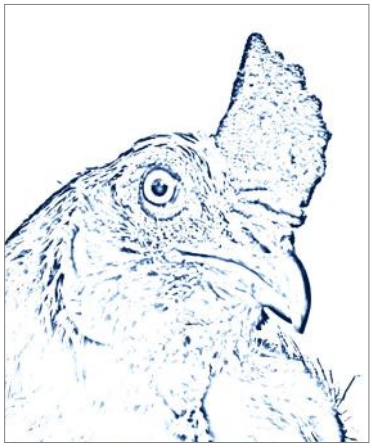


Fig. 3. The 'real' Alektryon! Copyright J. Papamatheou.

Description of the Work

Alektryon is intended to be an educational sundial and not simply to be a measuring instrument. It aims to show the rules which govern sun rays through an elegant work of art. It aspires to include aesthetics and mythology in its teaching, complementary to basic elements of sundial use.

Alektryon endeavours to illustrate that in an era of useful, but vulnerable, electronic technology, he intends to stay a non-sleeping guardian, a vigilant sentinel announcing the sunrise, not only in the present but forever.

Construction

Alektryon's dimensions and weight are relatively small so that it can be easily transported to the place where it is to be displayed. It is constructed in stainless steel with all relevant indication marks clearly machined and 'user instructions' incorporated (Fig. 4). Instructions are not given in terms of written words, or numbers, which would limit its universal appeal, but by the use of common geometry and symbols by which everyone communicates.

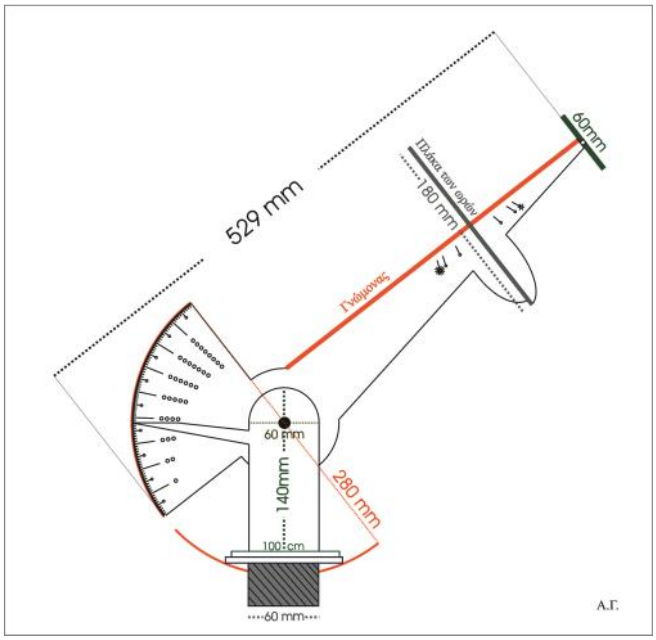


Fig. 4. Dimensions schematic.

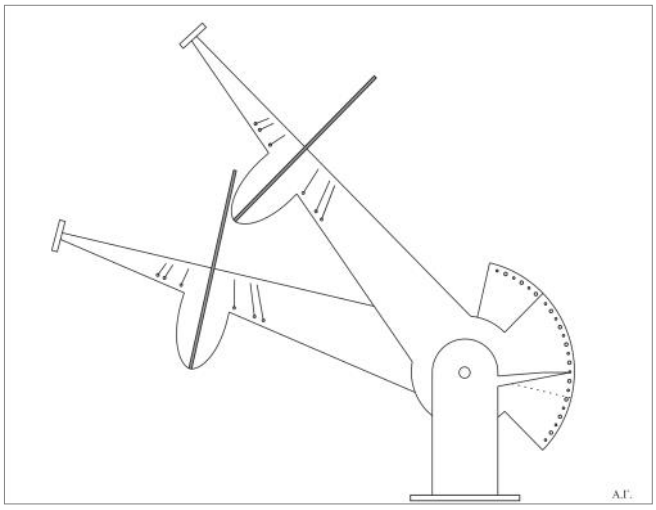


Fig. 5. Rotation of Alektryon's gnomon.

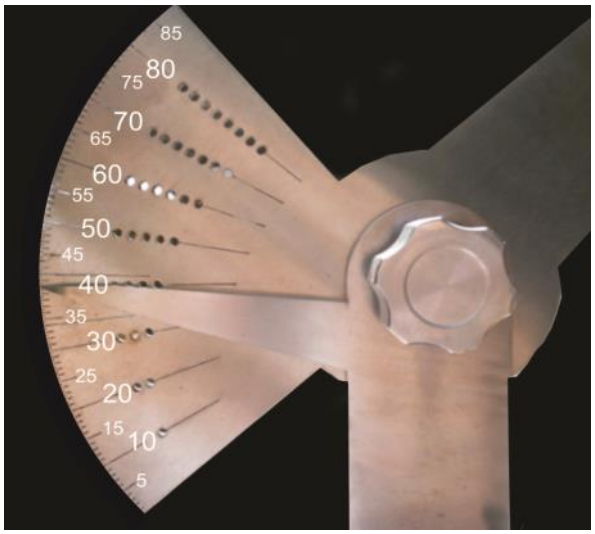


Fig. 6. Latitude adjustment.

Alektryon is an equatorial sundial; this makes it easy to appreciate that for about half of the year, the sun is north of the equator and for the rest of the year it is south of the equator. Since the dial is intended to be used in any location it incorporates a means of adjustment for different latitudes (Figs 5 and 6).

Details

The dial plate is made of 3 mm thick, 304 grade stainless steel. It is divided into hours, half hours, and quarter hours. Each hour is denoted by a corresponding number of holes understandable by all (Fig. 7). The distinguishing characteristic of the work is the trident (Fig. 8), the arrogant cock's comb of Alektryon. The trident is an insert set above the dial plate to show the sun's declination. The central element of the trident defines the zero degree of the scale, indicating the equinoxes. The scale runs from –23° 27′ (winter solstice) to +23° 27′ (summer solstice).

At the tip of the gnomon there is a sighting disc to aid the location of the pole star (Fig. 9). To assist with initial orientation of the dial, the base is inscribed with the

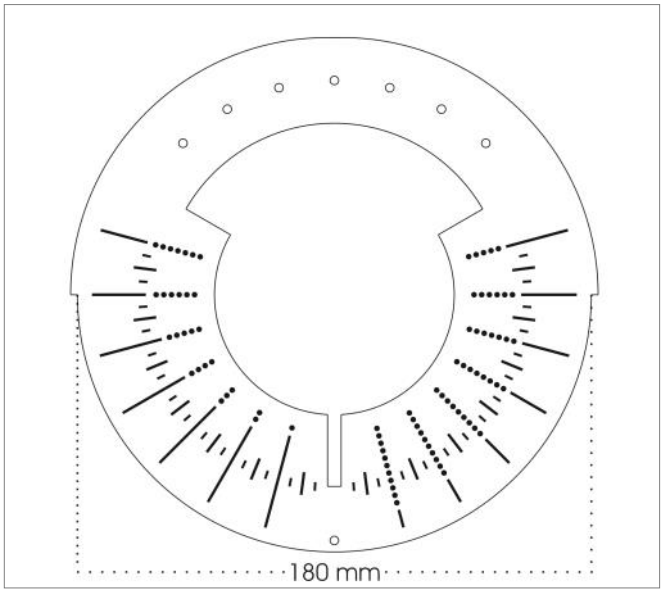


Fig. 7. Dial plate.

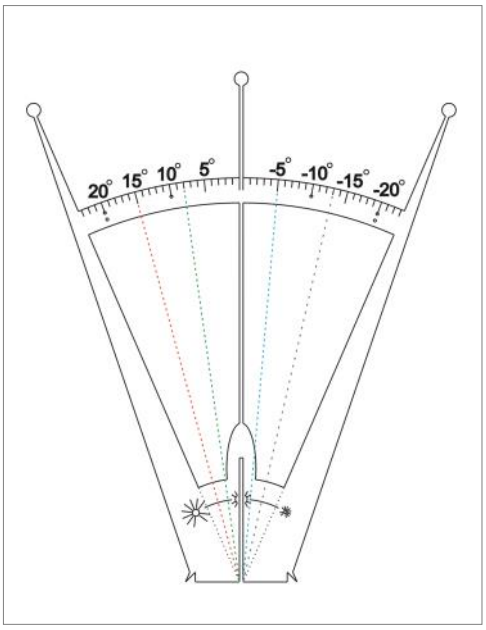


Fig. 8. The trident – cock's comb.

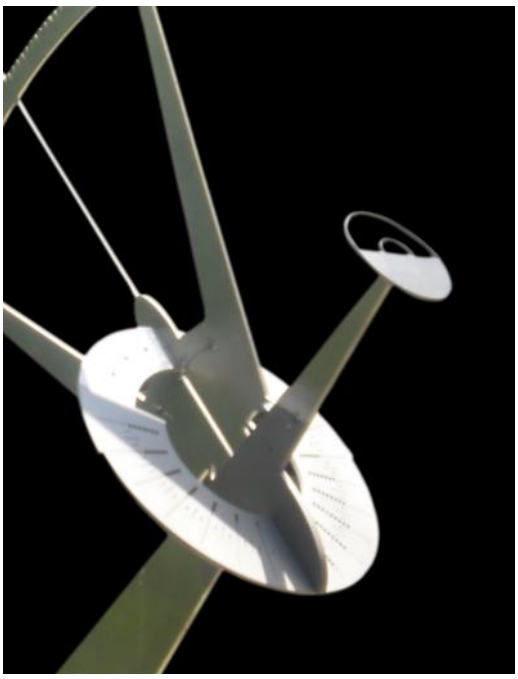


Fig. 9. The sighting disc.

cardinal compass points, and the whole can be rotated around the supporting post to allow correct true north alignment (Fig. 10).

Alektryon is mounted on a stainless steel post 60 mm in diameter, something which is not the most practical or stable mounting solution. It would be more operationally sensible if it were mounted on an aluminum alloy tripod, similar to those used to support small amateur telescopes. However, an Alektryon mounted on three legs would be an unacceptable aesthetic monstrosity (Figs 11 and 12).

Fig. 10. Rotational adjustment.

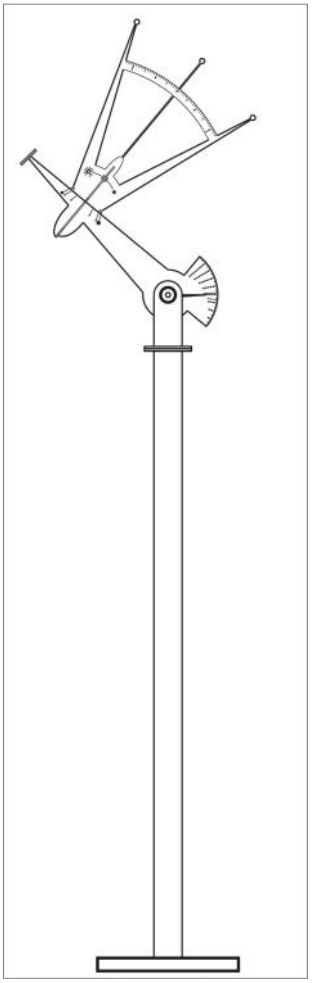


Fig. 11. Alektryon 'roosting' on top of his perch.

Fig. 12. Alektryon's appearance at sunset.

Development and Design Process: Eumetron

The myth, the inspiration for the dial design, refers to Harmonia the daughter of Ares and Aphrodite. Harmonia and 'harmony' being synonymous suggested that she should be linked in some way to the design of the dial. Since the aim of the project was to be inspirational and educational, what could be a better link than a supplementary instrument which measures the golden number φ, the proportion of beauty and harmony, an instrument that would be used in the design proportions of Alektryon (Fig. 13)?

This connection led Galanakis to design and produce an instrument which was known in Greek antiquity, especially in the Pythagorean School. The golden number φ was defined by Euclid as the 'extreme and mean ratio', i.e. the ratio having the value of 1.618, an irrational number.[3] The name 'Eumetron' was given to this design instrument.

The proportions of the Alektryon design were determined using Eumetron, and where such adherence to the golden ratio was not possible then a close approximation was used. In the Souda Lexicon the entry for 'compass' is: *ἐργαλεῖον ὁ διαβήτης, εὔχρηστος τέχναις πολλαῖς, τῷ Λ στοιχείῳ παρεοικός…* (*ergaleion ho diabetes, euchrestos technais pollais, toi l stoicheioi pareoikos…*), which translates as: "The compass is an instrument, useful for many crafts, which is shaped rather like the letter lambda Λ".

Eumetron is an extension of Λ, i.e. a vertical angle, forming X. This letter gives us an instrument which we can use both as a compass and as a caliper. Eumetron enables us to partition a straight line into two parts whose ratio is the golden ratio. Eumetron is made of stainless steel 2 mm thick and is 250 mm long (Fig. 14).

Uses of Alektryon

Alektryon can be used in a variety of ways as an educational tool to demonstrate the following:

- Orientation of the sun
- Local solar time
- Movement of Earth around the sun
- Observation of the solstices and equinoxes
- Determination of the optimal orientation for a house
- Assistance in the installation of solar panels
- Star gazing using the pole star as the reference

In addition, Alektryon can assist in setting up a compass rose. Installing Alektryon at a specific location defines the meridian line, i.e. North–South, at that location. This line thus provides a line of reference. It provides the datum needed to construct and install a compass rose for the place. This method is more accurate than relying on a magnetic compass because a magnetic compass indicates magnetic North, whereas Alektryon's gnomon points to polar North.

Alektryon can also be used to find the optimal placement for a stationary sundial. The usual problem in finding the correct position results from the proximity of intervening high buildings or trees. Alektryon works as a reliable simulator, since with the trident it will indicate the angle and direction of light rays during the course of the year.

Fig. 13. Pertinent measurements using Eumetron.

Time Indication

Time can be read on Alektryon on the equatorial plate as shown clearly in Figs 15 and 16.

Declination of the Sun at Noon

Throughout the year the declination of the sun is indicated by the shadow on the side of the gnomon at noon (Fig. 17). The line of the shadow relates to the schematic of the sun's

Fig. 14. Eumetron – golden ratio dividers.

Fig. 15. Time indication AM.

Fig. 16. Time indication PM.

declination as indicated by the 'comb' of Alektryon (Fig. 18).

Alektryon and Practical Technical Uses

Alektryon can also be used to help find the optimal position for the installation of photovoltaic cells or a solar water heater, making it a practical guide for installers (Fig. 19). If we take the example of Athens on a latitude of approximately 38° degrees (37° 58′ being the exact latitude of the Acropolis), then a suitable inclination for solar panels in summer would be an angle of 40° to 45°, and up to 50° in winter when the sun's rays are at a low angle.

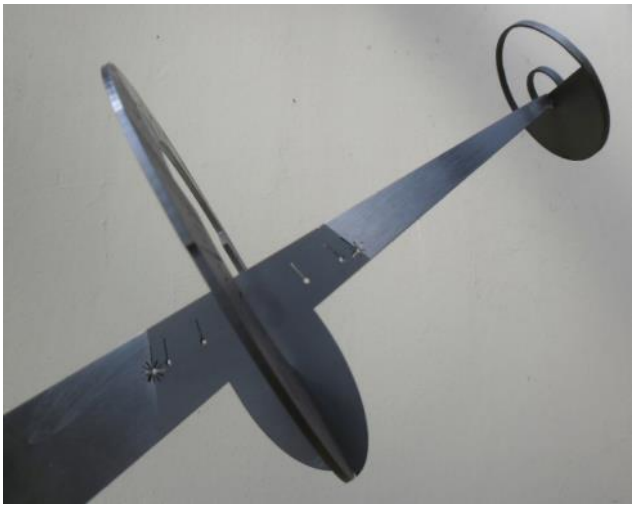


Fig. 17. Sandblasted surface, showing the shadow on the gnomon, following the change of seasons.

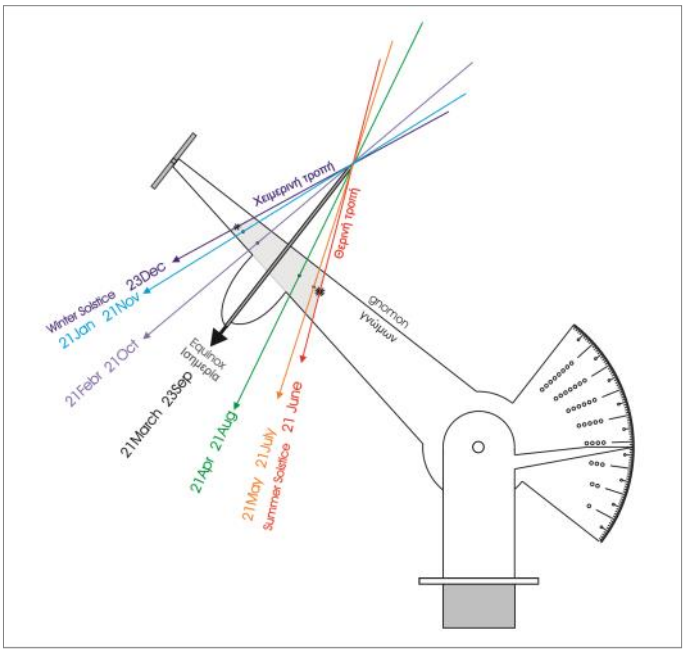


Fig. 18. Schematic of the sun's declination as indicated by the 'comb' of Alektryon.

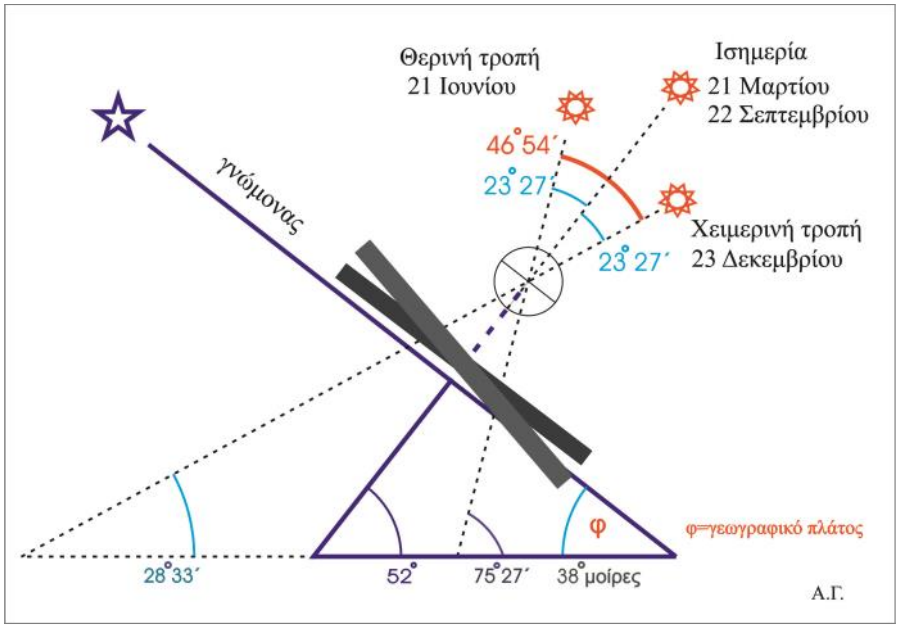


Fig. 19. Orientation of solar panels for best energy collection.

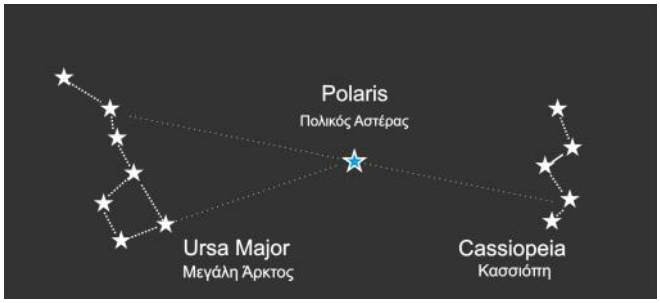


Fig. 20. Polaris, Ursa Major and Cassiopeia.

Fig. 21. Sofia Galanakis and students from a Psycho-social Studies Foundation (E.ΨY.ME) visiting Andreas's workshop to 'observe' Alektryon.

Star Gazing

As an educational tool Alektryon, a vigilant sentinel, will give us information even after sunset. By sighting along the gnomon, at night in the northern hemisphere, an observer can see the pole star and, nearby, Ursa Major and Cassiopeia. The observer has to look upwards through the central void of the dial plate past the sighting disc on the tip of the gnomon. In this way the observer will have the elemental reference points to start studying the night skies (Fig. 20).

Summary

Alektryon looks 'young' in his guise as a sundial. He is, however, ancient and dwells in a neighbourhood at the edge of our memories, a residence inhabited by myths, changing shapes, and names, but remaining always the same; like the moving shadow of Alektryon, which appears to change continuously as it streams through the motionless dial plate. Alektryon 'Αλεκτρύων' dressed in his stainless attire, a boasting cockerel standing on his mounting post, has gathered children around him (Fig. 21).

ACKNOWLEDGEMENTS

Martin is indebted to Andreas for providing such in-depth information about his dial and for permitting him to submit an article to the BSS for publication in the *Bulletin*.

Andreas would like to thank Prof. Efstratios Theodosiou for his help and guidance on writing the paper and Martin Jenkins for his help in the production of the final version. He would also like to thank Michael H. Moutzourides for translating the original Greek text into English.

REFERENCES and NOTES

1. A. Galanakis, E. Theodossiou & V.N. Manimanis: 'The construction of an equatorial sundial with a reference to Anaximander's Skiatheron', *BSS Bulletin* 22(iv), 22–25 (December 2010); Andreas Galanakis and Martin Jenkins: 'The Sundial Herm at Ancient Messene, Greece', *BSS Bulletin* 27(iii), 2–7 (September 2015).
2. Euripides: *The Suppliants*, l. 650, *The Complete Greek Drama*, edited by Whitney J. Oates and Eugene O'Neill, vol. 1, translated by E.P. Coleridge, Random House Publishers, New York (1938).
3. The golden ratio is the ratio of two measurements a and b where a/b = (a + b)/a. There are two values, the positive of which is $(1+\sqrt{5})/2 = 1.618$. The ratio often appears in architectural work, as objects so designed are considered more pleasing to the eye.

Andreas Galanakis was born in Piraeus with grandparents from both sides born on the small island of Antikythera. He has been working as a sculptor for the last 30 years. With regard to sundials he aspires to make them works of art and also serve as measuring instruments. In the course of undertaking projects, he enjoys cooperating with technicians, machinists, mathematicians, and philologists. Andreas can be contacted at *galanakis.gr@gmail.com*

Prof. Efstratios Theodosiou, president of the Hellenic Physicists Society, is an astronomer and member of the Emeritus Professors' Union of the University of Athens. He has published 82 scientific papers in international refereed journals, 18 papers in the *BSS Bulletin* and the *NASS Compendium*, 210 papers in international conference proceedings, and 424 articles in Greek newspapers and journals. In addition, he has written more than thirty books in Physics, Astronomy and History and Philosophy of Science. His website is at *http://www.stratos-theodosiou.gr/* and he can be contacted at: *etheodos@phys.uoa.gr*

Martin Jenkins can be contacted at *sundialduo@gmail.com*

IN THE FOOTSTEPS OF THOMAS ROSS

Part 26: Sundials of Melrose and Nearby

DENNIS COWAN

In volume 5 of *The Castellated and Domestic Architecture of Scotland*,[1] Thomas Ross identified several sundials in the area surrounding Melrose in the Scottish Borders. This article will look at some of them.

Starting off in Melrose itself, our first port of call is at the abbey. One of a number of ruined abbeys in this part of the Scottish Borders, this abbey was founded in 1136 and was the first Cistercian abbey in Scotland. In 1544 during a battle with the English armies, the abbey was badly damaged and never recovered its former glories. Today it and the other ruined abbeys are some of the main tourist attractions in this part of the country.

Ross, very helpfully, tells us the exact location of the sundial on the abbey:

"On the face of the buttress of the south transept, at the west side of the doorway, the lines and figures of a dial have been cut, with the date 1661 [Fig. 1]. *This dial has been merely carved on the face of an existing stone."*

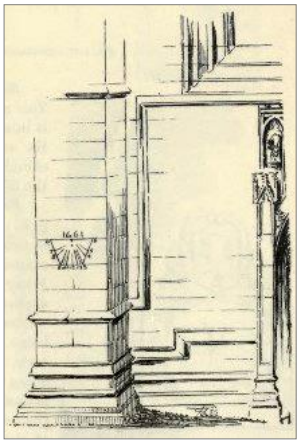


Fig. 1 (left). Ross's sketch of the Melrose Abbey sundial.

Fig. 2 (below). Melrose Abbey with the hard-to-see sundial circled.

Fig. 3. Close-up of the Melrose Abbey sundial.

It is just as well that Ross told us where it was, otherwise it could very easily have been missed, as you can see from Fig. 2. Once you know where to look it is obvious that it has lost its gnomon although its fixing holes remain (Fig. 3). It has rather fresh-looking Arabic numerals from 6 am to 6 pm with the date of 1661 above.

A couple of hundred yards away, and just off the market square in the centre of town, sits a fishmonger's shop. In Ross's day, however, it was a house and he says:

"This dial [Fig. 4] *is placed on the corner of a house near the Market Cross; it bears the date 162--."*

Other than the date, Ross doesn't go into any detail, but it is a simple stone cube sundial, with dials on the south-east, south-west and north-west faces sitting on a corbel on the corner of the building. However, the date of 162-- is significant. If it was dated 1620 to 1622 then it would be

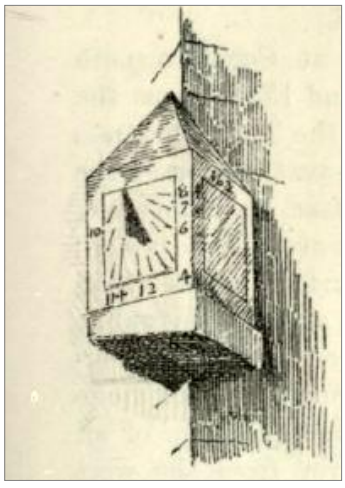


Fig. 4. Ross's sketch of the sundial in Melrose which could be Scotland's oldest dated example.

Fig. 5. The south-west and south-east faces of the Melrose sundial. Note that the south-east face has no date, numerals or hour lines visible today.

Fig. 6. The north-west and south-west faces of the Melrose sundial. Note the cross patty for noon on the south-west face.

the oldest dated sundial in Scotland. There are perhaps a couple of earlier contenders but their dates are not considered to be correct. Unfortunately no part of the date, which was on the south-east face as shown on Ross's sketch, is visible today. Likewise all of the hour lines and numerals on this face are gone, which is a great pity (Fig. 5). So we will never know if it was the oldest dated sundial. In any case, it is one of the very oldest Scottish sundials.

On the plus side, the Arabic numerals and hour lines on the south-west and north-west faces, although not great, are still visible and the gnomons still exist. The south-west face has a cross patty for noon (Fig. 6).

Just a mile or so from Melrose is the village of Newstead, where Ross identified six sundials. These were the subject of an article in an earlier *Bulletin* in December 2011,[2] but at that time, I was only able to find four of the six sundials. Since then, thanks to my contact in the village, Donald Gordon, another one of the six has come to light and now awaits restoration. He very kindly arranged for it to be brought to his garden where I was able to see it.

Of the sundials in Newstead, Ross says that:

"There are numerous dials in this village, a fact which is accounted for from the circumstance of Newstead having been the home of many first-class working masons, who had the taste to set up dials on their own houses."

Of this fifth dial, Ross states only that it is dated 1751, which can be seen in his sketch in Fig. 7. The sundial, which is in a very poor condition today, is a stone cube with dials on the south-east and south-west faces (Figs 8 and 9). It has Arabic numerals throughout and the date of 1751 can be clearly seen on the south-west face. Now there is only one of the six Newstead sundials identified by Ross still to find.

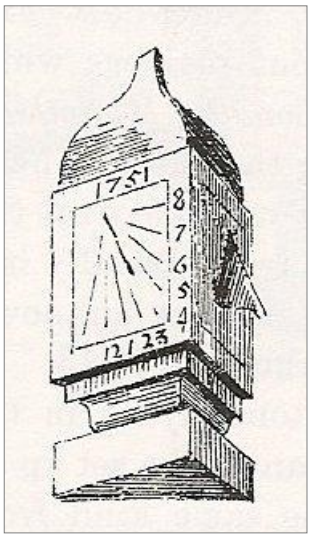


Fig. 7. Ross's sketch of the Newstead sundial showing the date of 1751 on the south-west face.

Fig. 8. The south-east face of the Newstead sundial badly damaged at the right hand side.

Fig. 9. The south-west face of the Newstead sundial with the date of 1751 mentioned by Ross.

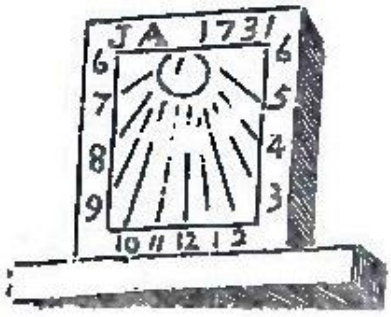


Fig. 10. The St Boswells sundial as sketched by Ross.

Fig. 11. The St Boswells sundial on the main street in the village.

Next we visit St Boswells which is less than five miles south-east from Melrose. Ross says simply:

"A dial [Fig. 10] *canted from the face of the wall of the house front. It is dated 1731, and bears the initials J.A."*

Ross gave no detail of where in St Boswells this dial was situated, but very luckily I spotted it when driving through the main street of the village (Fig. 11). He probably said as much as could be said about this dial. It does have deeply cut Arabic numerals from 6 am to 6 pm and has the date and initials as Ross said (Fig. 12). The house itself carries the date of 1730, so the dial was likely added just after the house was built.

Finally we head just a few miles east of Melrose to Dryburgh, where another of the ruined border abbeys lies. It was here that Ross identified another sundial which appeared in an earlier article in the Ross series,[3] but as I have gained further information on its provenance, I thought it useful to include it again here. Ross tells us:

"This dial [Fig. 13], *situated in the abbey grounds, is not unlike some of the market crosses just described…, the dial being the termination of an octagonal shaft. There are four faces. The one to the south has at the top of the dial the round face of the sun, with a goat above, and the motto WATCH WEEL. On the north side, in a position corresponding to the sun, is carved a rude figure, bearing a cross in one hand and something like a bell in the other, with the motto above FIDUCIA CONSTANTE.*

"On another face are the Scott arms, with the initials T.H., and on another the Campbell arms first and fourth, girony; second and third, a galley, with the initials J.C. As regards the conjunction of the Scott and Campbell arms on this sundial, the only circumstance known to us as at all likely to account for it is that Walter Scott, well known as "Beardie", the paternal great-grandfather of Sir Walter, married, in 1690, Mary Campbell, a niece of the Blythswood family. But as telling against the theory that this dial was set up by them we have to point out that the initials accompanying the arms on the dial do not correspond with theirs; they are T.H. and J.C."

Fig. 12. Detail of the St Boswells sundial.

Fig. 13. Ross sketched this Abbotsford sundial when it was at Dryburgh Abbey.

Unfortunately, at the time of my visit, there was no sign of the dial at Dryburgh and none of the staff at the abbey had any knowledge of it!

However, later investigations revealed that the dial had actually moved around a bit. It transpired that it had been taken from Dryburgh to Kelso in the 1920s before heading some time later to a manor house at Drygrange not far from its original home at Dryburgh. Then around 1989 it was gifted to the mansion of Abbotsford, famous as the home of Sir Walter Scott and well worth a visit, just a few miles to the west of Melrose.

Fig. 14. The Abbotsford sundial, originally from Dryburgh Abbey, stands on the lawn in front of the house.

Fig. 15. The south face of the Abbotsford sundial. The motto of "Watch weel", directly under the sphere, is hardly legible.

Fig. 16. The pedestal of Sir Walter Scott's sundial. The horizontal sundial has been missing for many years.

It is still at Abbotsford today directly in front of the house (Fig. 14), but it appears that Ross was wrong in assigning it to the Scott family. The arms on the sundial are those of Campbell as Ross says, but the other arms are those of the Haliburton family, which are not dissimilar to those of Scott. The Haliburton motto is "watch weel" and this motto is only just visible on the south face of the dial today directly underneath the ball finial (Fig. 15). The Haliburton arms are on the west face whilst those of the Campbell family are on the east face. There are replacement gnomons throughout which are all in excellent condition.

Ross was correct to point out that the initials on the dial did not line up with his theory, as this sundial undoubtedly belonged to Thomas Haliburton (1670–1753) who married Janet Campbell in 1701. He died in Dryburgh in 1753, two years after his wife. But Ross was not completely wrong – he just had the wrong great-grandparents, as Thomas and Janet were great-grandparents to Sir Walter through their daughter Barbara.

There is another sundial at Abbotsford not mentioned by Ross. It was acquired by Sir Walter himself but only the pedestal remains (Fig. 16) as the horizontal sundial went missing many years ago. In her book,[4] Alice Morse Earle tells us that an exact reproduction of this dial was made and was installed at a garden called Hillside near Albany in New York (Fig. 17), but the North American Sundial Society have no knowledge of it. This is unfortunate, as the staff at Abbotsford have no idea of what it looked like and would have loved to have sourced an exact replica.

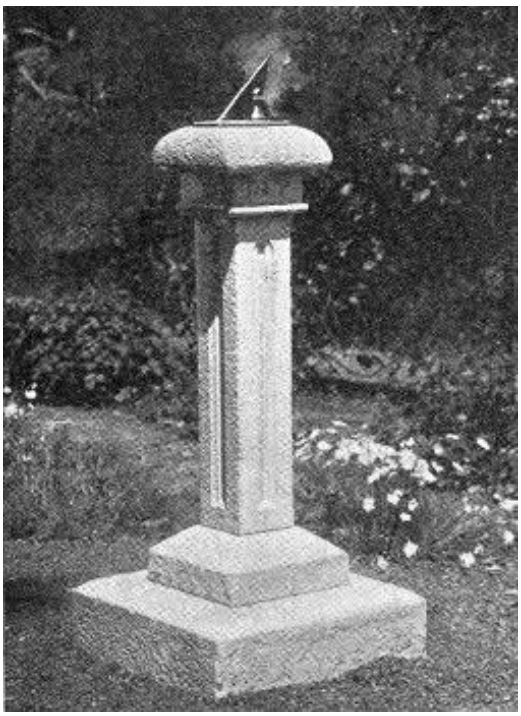


Fig. 17. Alice Morse Earle's photo of the reproduction of Sir Walter's sundial installed at Hillside near Albany in New York.

REFERENCES

1. D. MacGibbon and T. Ross: *The Castellated and Domestic Architecture of Scotland,* David Douglas, Edinburgh (1892).
2. D. Cowan: 'The Newstead Sundials', *BSS Bulletin*, 23(iv), 38-40 (December 2011).
3. D. Cowan: 'The Mercat Crosses of Scotland and their Sundials', *BSS Bulletin,* 26(iv), 12-19 (December 2014).
4. Alice Morse Earle: *Sun-Dials and Roses of Yesterday*, The Macmillan Co., New York (1902).

dennis.cowan@btinternet.com

A DIAL BY MARTIN CROSBY?

SUE MANSTON

Another rather interesting sundial has come to light via the BSS Help and Advice Service. The enquirer found the dial among his late grandfather's belongings and wanted to know if it had any value. He did not know anything about the history or provenance of the dial other than that his grandfather was in the demolition business.

The brass dial, shown in Fig. 1, is 12 inches in diameter. It has Roman numerals, read from the outside, including IIII for 4 am and 4 pm. There is a compass rose, a pierced gnomon (Fig. 2) and a noon gap. There are divisions for 7½ and 15 minutes, and round the outside there are transversals which show 1-minute intervals.

Fig. 3 shows a close-up of the inscription: "Martin Crosby 1766" and gives the latitude of the dial as 53° 30′. A quick check to see if Martin Crosby was a known dial maker drew a blank, and there was no mention of a clockmaker of that name in Loomes.[1] However, an Internet search provided information on a longcase grandfather clock by Martin of Crosby, Liverpool. According to Loomes this is "Martin, John, Great Crosby, Liverpool (Lancs.) 1750–c.1790. Signed some of his clocks at Crosby." Interestingly, the latitude of Crosby is 53° 29′ which ties in very well with the latitude inscribed on the dial. The gnomon fixings on the underneath of the dial are shown in Fig. 4.

Fig. 1. The brass dial plate (photo: Dave Hooper).

There seems little doubt that the dial is authentic. It looks very much like the work of a skilled clockmaker so it seems quite possible that the dial is by John Martin. The transversals around the outside are unusual and so is the

Fig. 2. The pierced gnomon (photo: Dave Hooper).

Fig. 3. Close-up of the inscription (photo: Dave Hooper).

Fig. 4. Gnomon fixings underneath the dial plate (photo: Dave Hooper).

compass design, so clearly Martin was an independent thinker and rather more than a jobbing clockmaker. He may have been acquainted with Henry Sephton (1686–1756),[2] a dial maker in Liverpool who is known to have used transversals.[3]

This appears to be the only dial by John Martin of Crosby that we know about, but it seems unlikely that it is the only one he made. Perhaps there may be others out there, just waiting to be discovered.

ACKNOWLEDGEMENTS

Thanks to John Davis for his help and advice, and to Dave Hooper for the use of his photographs.

REFERENCES

1. Brian Loomes: *Watchmakers and Clockmakers of the World. Complete 21st Century Edition*, NAG Press (2006), p.513.
2. Irene Brightmer: 'Henry Sephton – architect, mason and diallist', *BSS Bull.*, 22(iii) 46–52 (September 2010).
3. John Davis: 'A Mystery Welsh Horizontal Dial', *BSS Bull.*, 28(ii), 2–6 (June 2016).

suemanston@outlook.com

Holiday Pictures – Stallhof, Dresden

Doug Bateman sent us these photographs of the sundial in the Stallhof in Dresden.

The Stallhof courtyard is part of the Royal Palace complex where tournaments took place in the Middle Ages. On its inner wall there is a beautiful arcade known as the Langer Gang, or Long Walk; halfway along this, at first-floor level, there is a sundial (Figs 1 and 2).

An excellent source of information is to be found on Reinhold Kriegler's Ta-Dip website.[1] There we learn that the dial's approximate size is size 200 mm by 300 mm, and that it declines roughly south-west. It is in Baroque style on plaster, painted green. The hour lines are offset to allow for longitude, and the Roman hour numerals X–XII–VI are set in a semi-circular chapter ring. The polar-oriented rod gnomon bears a ball nodus, and there are seven constant-declination lines with signs of the Zodiac. The motto, below a flaming sun, reads MORS CERTA HORA INCERTA (*death is certain, its hour is uncertain*). According to Wikipedia,[2] the original dial was made in 1568.

Fig. 1. The Stallhof, with the sundial half-way along the arcade.

Fig. 2. The dial.

Most of the Stallhof, including this dial, was destroyed by Allied bombing in February 1945. Reconstruction began in 1957, and the dial was restored in 1976 by Gunter Hermann, following the original design, and with delineation calculated by Ernst Dambeck.

Reinhold Kriegler recounts an amusing visit to the palace in 2013. He had forgotten to note the location of the dial and asked a number of passers-by who were unable to help. He went to the Tourist Office and the helpful man behind the counter did not know either but said he would try a computer search. He was quickly successful and turned the screen towards Reinhold who immediately recognised his own website!

References

1. *http://www.ta-dip.de/sonnenuhren/sonnenuhren-aus-nah-und-fern/sonnenuhren-in-sachsen/die-sonnenuhren-in-dresden.html*
2. *http://de.wikipedia.org/wiki/Stallhof_%28Dresden%29*

FHK and CHN, with photos by Doug Bateman

DIAL DEALINGS 2018

MIKE COWHAM

This is my selection of some of the dials sold in various salerooms in 2018. There seem to have been just a few sales but the following are some of the more interesting dials sold.

Charles Miller, London, 1 May 2018

There were 11 dials in this sale but I have chosen just one. It is a slate sundial by Richard Melvin made around 1850 (Fig. 1). It has a central dial with four subsidiary dials in its corners, each of them showing the times at two different locations. It is 14″ (36 cm) square and was made for a latitude of 51° 50′ north. It sold for its top estimate of £1,500.

Fig. 1. Slate dial by Richard Melvin. © Charles Miller, London.

Christie's, London, 10 July 2018

In this sale was a magnificent standing universal equinoctial ring dial by Jonathan Sisson from about 1730 (Fig. 2). It stands about 12″ (30 cm) high. Its condition was relatively good but it was lacking its compass which should be set in the circular aperture in the base plate. Its sale price was £23,750. This dial was the subject of an article in the September 2017 *Bulletin*.[1]

Bonhams, London, 19 September 2018

This sale offered several fine dials from the collection of Joseph Fry (1728–87) who was a great-grandson of the founder of Fry's Chocolate. In his collection were about 40 dials, mostly pocket sized, and I have selected just four of particular interest.

The first is a vertical disc dial which works from the altitude of the sun. It is in brass and is dated 1553 (Fig. 3).

Fig. 2. Standing ring dial by Jonathan Sisson. © Christie's, London.

Fig. 3. Vertical disc dial dated 1553. © Bonhams, London.

In use, the front disc would be rotated 90° clockwise so that the small pointer, now on its left side, would point to the correct date on the upper scale. A pin gnomon would be inserted into the hole just below the 1553 marks. The dial was estimated £400–£600 and sold for £750.

The next dial is of gilt brass. It is an astronomical compendium by Ulrich Klieber which he has dated as 1571 (Fig. 4). It has various dials on each of its faces. Inside, around its compass, is a standard horizontal dial. On its lid is a luni-solar conversion disc and on its underside is a dial for Italian hours (Fig. 5). Its estimate was just £3,000–£5,000 but it actually sold for £35,000.

Fig. 4. Astronomical compendium by Ulrich Klieber.
© Bonhams, London.

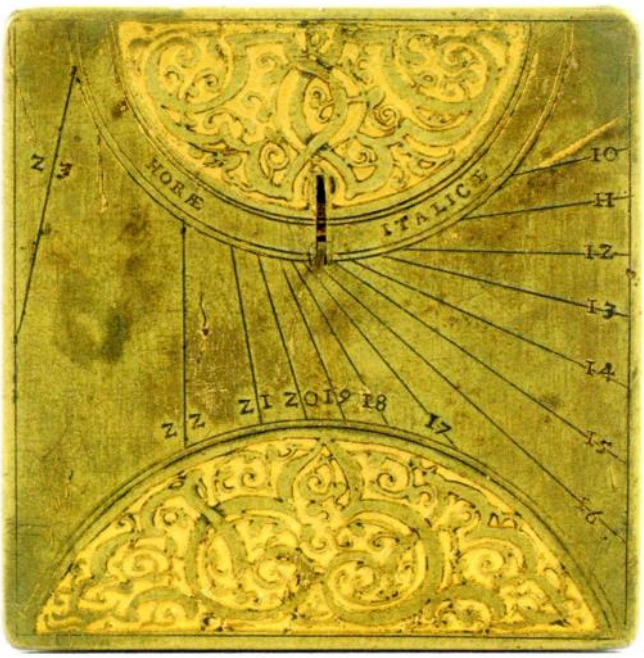


Fig 5. Underside with dial for Italian hours.
© Bonhams, London.

The next dial shown is in the shape of an eight-pointed star (Fig. 6). Seven of these points act as gnomons, throwing their shadows onto 14 separate time scales, set on the faces of each arm of the device (Fig. 7). It is signed H. F. which is probably Hans Felt, a German working in the 16th century. In use, the dial would need to be set parallel to the equator, and aligned by its compass. It was estimated £1,200–£1,800 but actually sold for £5,625.

Fig. 6. Eight-pointed star dial by Hans Felt.
© Bonhams, London.

Fig. 7. Hour markings on star dial.
© Bonhams, London.

Fig. 8. Double horizontal dial by Elias Allen, c.1630. © Bonhams, London.

The last dial shown is a double-horizontal dial, width 7″ (18 cm), by Elias Allen from c.1630 (Fig. 8). It was previously unrecorded so it now becomes the 14th double horizontal dial by Allen. Unfortunately it was missing its gnomon. It sold near its top estimate at £2,375.

ACKNOWLEDGEMENTS

The illustrations used in this article are the copyright of the various auction houses mentioned and should not be reproduced without their permission.

Charles Miller, London: Fig. 1.
Christie's, London: Fig. 2.
Bonhams, London: Figs 3 to 8.

REFERENCE

1. David Hawker: 'A standing ring dial by J. Sisson', *BSS Bulletin* 29(iii), 41-43 (September 2017).

mandvcowham@gmail.com

BOOK REVIEWS (1)

Sundials of Saint Petersburg. History, myths, fallacies. (In Russian: "Солнечные часы Петербурга. История. мифы, заблуждения.") by Valery Dmitriev, 132 × 199 mm, soft covers, 196 pp, 112 colour illustrations. Published by Kriga, Saint Petersburg (2018). ISBN 978-5-901805-26-8.

No doubt readers of the *Bulletin* have seen and read articles by BSS overseas member Valery Dmitriev. Over the years we have observed his interest in the history of sundials and his striving to produce gnomons in various artistic shapes. And as of December 2018, we can congratulate Valery who now has this book to his account. Since I was able to read Russian, I thoroughly studied the book, and would like to share my impressions.

The book is notable in several ways. First of all, this is the first book on sundials published in Russia for at least four decades. Secondly, it serves as the most comprehensive guide to sundials in the city of Saint Petersburg and its outskirts. For every sundial, Valery provides a detailed history with a considerable amount of references to books, articles and archive materials. Some sundials disappeared during the 20th century, and the book discusses the facts that are known about them. Thirdly, the author shares with us his own experience of making sundials. This ranges from the practicalities of dialling to the perception of sundials by society.

The enjoyable language, pertinent references to classical literature and popular culture with a slight seasoning of irony make this book something more than just a guide to sundials in a particular area. Ten years have passed since Valery's article in the March 2009 *Bulletin* on 'Sundials of Saint Petersburg',[1] and this book now covers more sundials in greater detail. It also educates, explaining how to make a simple sundial, where to place sundials, and sundial-related traditions. Valery disclosed to me that one of the goals he had defined for this book was to spark the interest of the general public about the world of sundials. I'm quite sure this work has all the potential to achieve this. The results will depend on the availability of this book at bookstores.

Martins Gills

Reference

1. Valery Dmitriev: 'Sundials of Saint Petersburg', *BSS Bulletin* 21(i), pp. 22–26 (March 2009).

Siege of Leningrad sundial (2016) visited by its designer Valery Dmitriev (left) and Martins Gills (right), May 2018.

JILL WILSON

Sadly, another of our respected members has died. Rosalind Jill Wilson (19 November 1929 – 5 December 2018) was an active member of the Society, and is noted for compiling the *Biographical Index*. We assume that a potential university education was prevented during the war years and afterwards, when priority was given to men and those returning from the war. It was much later that she took an Open University degree; in fact she was one of the first students in about 1969–70. Her career was spent in the senior management of education at the then London County Council. BSS Member Tony Wood recounted that she was responsible for the purchase, at some expense, of their first computer. Following from her degree studies, she spent some time studying Egyptology, geology and archeology in Egypt and the Middle East. Margery Lovatt adds: "You probably know she was part of an active group of scientists living in her area [Chipping Campden]. She had a wide variety of interests. I talked to her about some personal research she'd done into the different varieties of wheat grain grown throughout Europe. This confirmed her suspicion that the high incidence of gut problems we have in the UK is entirely due to the type of grain we grow which is particularly indigestible." As if this wasn't enough, Jill also continued her childhood interest in geology throughout her life, as attested by the many rock samples at her house. She was a member of the Royal Geological Society, the British Museum, the Natural History Museum, the Egypt Exploration Society and many other institutions. With all these Societies she toured England and Europe. She never lost her interest in astronomy and got to know Patrick Moore and other eminent space scientists, as well as finding time to ski and visit many far flung places around the world.

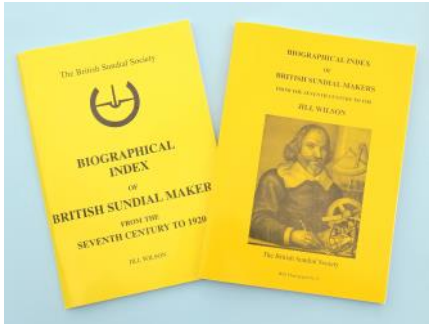
David Young reports that prior to joining the BSS, Jill was chairman of the Chingford Historical Society for 6 or 7 years and a change in circumstances encouraged a move to the country, which turned out be to the heavily-sundial-endowed Chipping Campden. Yet another anecdote is due to Jill herself, in an email to Christine Northeast, as follows.

> I was a new member in a pretty new Society – I joined because I have always been interested in astronomy and local history, & knew David Young, the then secretary, well. Anyway at my first AGM I found myself elected onto the Council & at the Council meeting immediately following the AGM Chris Daniel said "and we need someone to make a list of all sundial makers" looking at me. When I agreed he added "and if you can add a few biographical details too…"
>
> Looking back I suspect that this was because I was a previous chairman of Chingford Historical Society (David Young had been the secretary & later Chairman) so my interest in historical research was not unknown to Chris Daniel. At the time I was a bit overwhelmed.

At Chipping Campden Jill could be found in fancy dress on the WI Scuttlebrook float. Photo courtesy of Carol Jackson.

To add a very short story of my own, on a visit to her home (this gentle lady was such an amenable host) I noticed a whole shelf full of Star Trek videos, and she confessed to being an ardent 'Trekkie'.

However, it is essential to draw attention to, and with the highest praise for, her work for the Society in completing her pledge to Christopher Daniel to create the *Biographical Index of British Sundial Makers*. This is a huge piece of work, which quickly progressed to a second edition. The third edition, which Jill completed a few months before she died, lists almost 1,900 names, with each entry including biographical details (if known), dials made, and a paragraph or two about the maker. The entries give cross references to other sources, and the *Index* has appendices covering sequences of dial makers and apprentices, indentured apprenticeship, a list of Freemen and Brothers of London Guilds, and masters and apprentices in various livery companies. Sadly, Jill died just as the final version was being readied for the printers and so she was not able to see it as hardcopy.



Editions one and two of the Biographical Index. The third edition will be issued soon.

Age brings the inevitable and Jill will be much missed by members, particularly at the Conferences. Her executors state that in her will, she made a bequest to the BSS, no doubt reflecting her feelings towards the Society and its members.

Doug Bateman

REMEMBER, REMEMBER…

DAVID BROWN

November 2018 was memorable for its being the hundredth anniversary of the end of the First World War and many poignant ceremonies were held all over the globe. A search in the BSS Fixed-Dial Register reveals around sixty UK sundials that commemorate both world wars and other events such as terrorist bombings and lives lost in conflicts. The majority are horizontal dials but only one is an analemmatic dial, namely that at the National Memorial Arboretum at Alrewas in Staffordshire (SRN 4695). It was installed in 2001 and pays tribute to the 32,000 merchant seamen who died in the Second World War. It was commissioned by the Honourable Company of Master Mariners and was designed and delineated by our President Chris Daniel (Fig. 1). This article describes two new war memorial analemmatic sundials that have recently been completed and dedicated in this centenary year.

Fig. 1. The Merchant Seamen memorial sundial at The National Memorial Arboretum at Alrewas, Staffordshire (photo courtesy of Christopher St J H Daniel).

The Alrewas dial was the inspiration for a new memorial analemmatic sundial for Aldridge, near Walsall, West Midlands where The Rotary Club of Aldridge and the Aldridge Croft Community Group worked together to create a 'Making Time for Memories Human Sundial'. The initial plan was to install it in a pleasant parkland area known as Aldridge Croft, but in the end a site in the nearby Aldridge School became the preferred location. Walsall Council Regeneration and Environmental Services, local schools and other community groups joined in to make this

Fig. 2. The 'Making Time for Memories' sundial at Aldridge, Walsall, West Midlands (photo courtesy of the Rotary Club of Aldridge).

a truly wonderful co-operative venture. For many years the Rotary Club of Aldridge have been actively involved with the annual Aldridge Poppy Appeal and the Remembrance Parade and Service and they felt that an interactive and educational community project, which recorded the many conflicts that have occurred, and the sacrifices made by our Service People, was appropriate. The whole project was co-ordinated by Rotarian Bob Cooke and made possible with a 'Tesco Bags of Help' community project grant.

The project came to light through the BSS Help and Advice service when Bob Cooke sought help in July 2018 with delineation data. Sue Manston provided extensive guidance and useful sources of information. I was able to provide data for him and thereafter we have kept up the correspondence.

The dial has a 2.1-metre semi-major axis with hour points from 7 am to 5 pm adjusted for longitude (Fig. 2). The date scale is 1.1 metres long. Lines of imprinted clay bricks run between the date scale and the hour points. The clay bricks were made by local brickmakers Weinerberger who took on board the meaningful wording provided by nearby schools

Fig. 3. An example of one of the clay brick inscriptions (photo courtesy of the Rotary Club of Aldridge).

Fig. 4. Clay tablets relating to the two world wars with their maker Richard Grundy (photo courtesy of the Rotary Club of Aldridge).

and individuals (Fig. 3). A rectangular pavement adjoining the south side of the dial embodies other unusual features: two special clay tablets having First and Second World War features designed and sculpted by local artist Richard Grundy (Figs 4 and 5); clay poppies designed and produced by Mayfield, Leighswood and Aldridge Schools which the Rotarians encased in resin (Fig. 6); a 2-metre metal 'Peace Post' which carries further inscriptions and two single-leg information lecterns providing insight into the many conflicts and sacrifices made for our freedom (see Fig. 2). The displays are also designed to stimulate interest in aspects of time and principles of sundials. The project has engaged with the public, particularly the younger generation, through the involvement of schools.

The small village of East Stour in North Dorset has two fine war memorial marble tablets just inside the entrance hallway of the village hall (Fig. 7). The names of seventy-eight men from the neighbourhood are recorded on them. Sadly, the surrounding space is too small to have more than a handful of people in sight of it for Armistice services, so an enterprising villager and local councillor, Guy Gilding,

Fig. 7. The marble memorials in East Stour Village Hall.

Fig. 5a. Details of the WW1 clay tablet (photo courtesy of the Rotary Club of Aldridge).

Fig. 5b. Details of the WW2 clay tablet (photo courtesy of the Rotary Club of Aldridge).

Fig. 6. Clay poppies set in resin, designed and made by school pupils and Rotarians (photo courtesy of the Rotary Club of Aldridge).

Fig. 8. The memorial sundial at East Stour, North Dorset.

Fig. 9. The date scale and memorial tablet.

Fig. 10. Detail of the granite memorial tablet.

has spent three years gradually gaining local support and collecting funding for the creation of a memorial at the edge of the adjacent playing field (Fig. 8). The memorial is in the form of an analemmatic sundial so that there is ample space for many people to stand around it on special occasions. It can also, of course, be used for time-telling by individuals who will immediately see the slightly-raised memorial tablet at the northerly end of the date scale (Fig. 9). The sundial has a semi-major axis of 2.2 metres.

I helped with the delineation and alignment, but the excellent groundwork and edging were done by local builder Steve Wattridge. The overall dimensions of the rectangular bed are 5 × 3 metres. The seventeen Portland base bed stone hour points (23 cm square and 6 cm thick) and date scale (140 × 25 × 10 cm) were carved with V-cut lettering, painted black, and laid on mortar by Ian Viney of Stonemasons of Dorset Ltd. The memorial tablet is in black granite with laser-etched inscriptions set into a 10 cm thick slab of Portland stone measuring 80 × 50 cm (Fig. 10). The spaces between the elements of the sundial are filled with slate shingle. The collected funds were great enough to pay for a new pathway to be constructed between the hall car park and the sundial.

On 18 November 2018, and in the presence of descendants of some of the men who died, the sundial was dedicated with due pomp and ceremony by the local Vicar, Revd Tim Heaton, himself a former military man (Fig. 11). Members of the local council were there, together with the MP for North Dorset, Simon Hoare; the Mayor of Gillingham Councillor, Su Hunt; The Royal Air Force Association; the Gillingham branch of The Devonshire and Dorset Regiment and the Rifles Association; The Royal British Legion; army cadets and an excellent bugler. Pupils from the local primary school took part in the ceremony which was well attended by several members of the public. In all, many more were present than could have been accommodated in the entrance of the village hall. A formal document was signed, handing over ownership of the sundial from the

Fig. 11. Dedication of the East Stour memorial sundial in November 2018.

THE STOURS PARISH COUNCIL

East Stour Stour Provost Todber West Stour
Clerk: Mrs M Cox, Swallows Rise, West Stour, Gillingham, Dorset. SP8 5RL

Telephone 01747 838367 E-mail – stours@dorset-apc.gov.uk

Dedication of new war memorial in East Stour

Location – North corner of East Stour playing field
Design – Analemmatic (human) sundial, 5m x 3m

The memorial has been constructed solely from private donations. It is dedicated to everyone from East Stour who has been affected by war and compliments the stone memorials located in the village hall foyer.

On this day, Sunday 18th of November, Two Thousand and Eighteen at Eleven a.m. the memorial is formally dedicated and handed to The Stours Parish Council whose responsibility it now becomes.

Received on behalf of The Stours Parish Council -

Bobbie Edwards
Chair of East Stour parish

Witnessed by –

Guy Gilding
Counsellor and Project Leader

Rev. Tim Heaton
St. Mary the Virgin Gillingham

David Brown
Sundial Architect

Roger Weeks
Branch President
Royal British Legion, Gillingham

Fig. 12. The signed document of ownership.

project team to the local council (Fig. 12). This was the first time I have been described as a sundial architect!

Another centenary is remembered in 2019 – the signing of the peace treaty in Versailles. I have a sundial made and inscribed to commemorate that event (Fig. 13). It is unsigned, but the basic design is in a very similar style to dials advertised by Francis Barker & Son of Clerkenwell around that time, and may be one of the earliest examples of an etched pattern. The plate is 3 mm brass, measuring 333 mm diameter with four levelling feet, all of which just penetrate through to the top of the plate. The gnomon is 8 mm thick, retained by two cheese-head screws from

Fig. 13. Treaty of Versailles brass sundial.

below and its style is at 52° to the dial plate. It appears to be correctly calibrated in 5-minute intervals and the Equation of Time is given in tabular form around a labelled 16-point compass rose. Hours are inscribed as Roman numerals read from the outside. 4 o'clock is given as IIII and there is a noon gap. The months are separated by engravings of flowers. The principal inscription to the south reads:

PEACE

SIGNED WITH GERMANY

JUNE 28TH 1919

AT VERSAILLES

And finally… The photograph shown in Fig. 14 was sent to me by Anton Schmitz in a Christmas exchange of letters. He made this memorial out of red quartz stone in 2014. Elisabeth Hintrager was a much-respected founding member of the German Sundial Society. The family burial site in Reutlingen also includes her father Oskar Hintrager who was for years a civilian administrator of German Südwestafrika – now Namibia. Anton relates that Oskar "was one of the people in South West Afrika who signed the Peace Treaty in 1918".

Fig. 14. Memorial dial by Anton Schmitz (with thanks to Ursula Schmitz).

ACKNOWLEDGEMENTS

My thanks are warmly given to the kind co-operation of the team leaders of the two major projects – Bob Cooke in Aldridge and Guy Gilding in East Stour, and to BSS Registrar John Foad, who with Ian Butson unearthed records of many UK memorial dials. John Davis gave some welcome insights into the Versailles sundial.

david@davidbrownsundials.com

ANGELA COURT SUNDIAL

MARTIN JENKINS

In Tipton St John, a village in East Devon spanning the River Otter, there is a privately owned residential home, until late 2017 known as 'Angela Court'. In the extensive grounds to the rear of the property there is a sundial located in a flower bed (Figs 1 and 2). Knowing of my interest in sundials, the owners kindly granted permission for me to have a look at it. In 2010 I gave a short presentation on the dial at the Newbury meeting but I lacked any real information about it until recently, hence now this article for the *Bulletin*.

Background History

Angela Court started life as the vicarage for Tipton St John Church, which was built in the 1840s with the vicarage soon after. The vicarage was first occupied by the Revd Augustus Archer Hunt and his wife Sarah Emily. He lived there from 1844 until 1889, whilst serving as Vicar of St John's Church. His father was Major Richard Burgess Hunt who was highly respected in the British Army and a magistrate of Devon. The Major died in 1849. The altar window in the church is dedicated to him, and the names of Augustus and Sarah were added at later dates.

It has been suggested that the sundial may be in memory of the Major.[1]

Why the Name 'Angela Court'?

Captain R.Y. Anderson Morshead and his wife Angela married in Salcombe Regis at the beginning of the Great War, and when he was posted to India and Mesopotamia with The Devonshire Regiment, his wife accompanied him.

Fig. 1. Angela Court with the dial in the foreground.

Fig. 2. The cube dial with the horizontal Dollond dial.

After the war they returned to Devon and in 1922 moved to Tipton St John, having purchased the vicarage from the Ecclesiastical Commissioners as the then vicar, the Revd G. Every, had decided to move to Glebe Cottage in Tipton village, because he felt that the vicarage building was too big for him. Captain Anderson Morshead and Angela renamed the vicarage 'Metcombe End' (the vicarage is sited between Tipton St John and the village of Metcombe).

Captain Anderson Morshead became President of the local football club and the local horticultural society. He was also Chairman of the local British Legion. Angela Morshead was greatly involved with the Tipton St John Women's Institute. Together they did a tremendous amount of work for the church at Tipton St John, including heading the committee that oversaw the commissioning of the marble memorial plaque dedicated to the men from the village who gave their lives in the Great War.

Sadly, in 1931 Angela Morshead died after a long illness. As the couple had no children it was her wish that on her

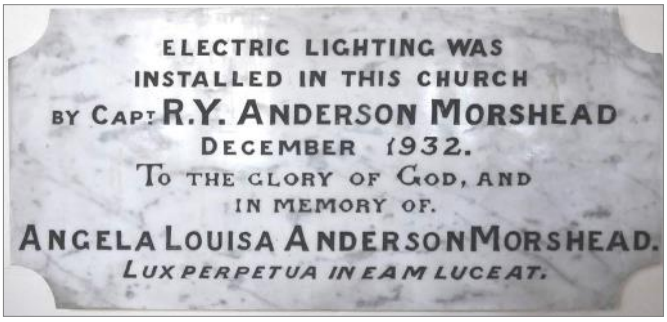


Fig. 3. The commemorative plaque to Angela Morshead.

and her husband's death, their house be used for the benefit of sick children. However, Captain Anderson Morshead was so anxious to see the home of his late wife occupied by needy children that he made arrangements for the Devonian Association for Cripples Aid to have the property straight away instead of on his death. It was to be known as the 'Angela Convalescent Nursing Home'. Information from this period is rather 'sketchy' and thus it has not proven possible to determine whether the home was then for children, adults, or both.

In 1932 Captain Anderson Morshead paid to have electric lighting installed in the church in memory of Angela and commemorated the event with a marble tablet inscribed LUX PERPETUA IN EAM LUCEAT: *let light perpetual shine upon her* (Fig. 3).

Sometime later the Angela Convalescent Nursing Home became simply 'Angela Court'.

The Dial

The overall sundial, shown in Fig. 2, consists of a pedestal surmounted by a cube dial with a brass horizontal dial plate mounted atop of that (Figs 4 and 5). The maker's name DOLLOND / LONDON and LAT. 51:15′. are engraved on the dial plate (Fig. 6). Strangely, the quoted latitude is over half a degree different from the actual latitude of Angela Court (50° 43′ N). This is quite intriguing as latitude 51° 15′ is outside the limits of the entire south-west peninsula. So the family probably did not originate from the south-west. To date it has not been possible to ascertain where the Hunt family came from and whether this was their 'home' latitude, and if so where? In addition latitude 51° 15′ does not relate to London where the dial was made. Maybe dial makers offered a range of 'near-enough' latitudes for purchase? If not then it seems likely that the dial plate was made for another location before it was brought to Angela Court.

The cube, which appears to be considerably older than the dial plate, has four vertical dial faces for the cardinal points of the compass, although it is rotated 180° relative to the Dollond dial plate (Figs 7 and 8). All four vertical dials have lost their gnomons, when and how no one knows. Overall, however, as can be seen from the photographs the sundial is in pretty good condition. The whole is mounted on a very substantial stone base which leads me to

Fig. 4. The horizontal dial by Dollond.

Fig. 5. Top view of the Dollond dial.

Fig. 6. Detail of the maker's name.

speculate that the sundial is in its original position in the garden.

However, the cube needs rotating approximately 180° on the pedestal to correct its orientation, as at present the 'south face' is on the 'north side', and the whole is incorrectly aligned for time telling anyway. At some time in the past, the cube dial must have been reassembled

Fig. 7. The west side of the cube, delineated as for a direct east-facing dial.

Fig. 8. The east side of the cube, delineated as for a direct west-facing dial.

incorrectly. More intriguing is that at present the Dollond dial is set correct for true south but is not aligned correctly with the cube dial faces even though the cube faces are delineated for direct orientations i.e. due south, due north etc. Inspection shows that the Dollond dial is screwed into its original location holes in the cube top. It would therefore seem likely that the cube dial was in place long before the Dollond dial was added and the Dollond dial was aligned

Fig. 9. SPLENDIDIUS – *inscription on the west side.*

Fig. 10. NECASTI – *inscription on the east side.*

Fig. 11. SOLE – *inscription on the north side.*

Fig. 12. QUARE – *inscription on the south side.*

and fitted correctly ignoring the incorrect alignment of the cube dial!

The Latin Inscriptions

Each side of the base rim below the cube has a Latin inscription: on the 'currently orientated' north side, SOLE, south side, QUARE, west side, SPLENDIDIUS (Fig. 9) and east side, NECASTI (Fig. 10); SOLE and QUARE are less clear, as a result of erosion and lichen growth (Figs 11 and 12).

The words are not of a well-known motto, and as they did not seem to make any sense to me, I enlisted the help of others.

John Shilke, a Latin expert in the North American Sundial Society suggested: *why did you kill more splendidly than does the sun?*

Fred Sawyer's daughter Bethany, also a Latin expert, suggested: *for which reason/wherefore/by which means you killed more splendidly than the sun?*

A friend of Fred Sawyer, Alessandro Gunella, suggested that it may be Latin from the 16th century before the Reformation: *You that present yourself in a splendid way, more than the sun, why have you killed?*

The Revd Clinton Crawshaw, friend of local historian Judith Taylor, has suggested: *Why did you kill the sunshine? Why did you kill the brightness of the sun? Why did you extinguish the glory of the sun?*

This last translation could be taken as meaning a grief so profound that the sun seems to shine less brightly. This would certainly seem to support the theory that the sundial is a memorial to the well-respected Major Richard Burgess Hunt.

Summary

It seems likely that the sundial as it now appears has probably been standing in the garden of Angela Court, silent and majestic for over 150 years, probably commemorating the life of a well-respected and loved man. As yet no documentation relating specifically to the dial and its installation has come to light but our assumptions seem reasonable, don't you think? Hopefully, ongoing research into local history may reveal more about the sundial at some future date.

Incidentally, in late 2017 Angela Court nursing home reopened after a major refurbishment under the new name of 'Sundial House'!

ACKNOWLEDGEMENTS

I most sincerely thank Mrs Judith Taylor for her help in providing local information pertinent to the Angela Court sundial. Mrs Taylor provided the majority of the background history, gleaned from her local history researches and reported to me verbally or in emails. Apparently much of this history has been collected by her from old newspapers and personal village contact knowledge.

I would also like to thank John Shilke, Bethany Sawyer, Alessandro Gunella, and the Revd Clinton Crawshaw for offering Latin translations.

The mis-orientation of the cube and the mismatch of the latitude on the Dollond dial with the actual location was overlooked by all at the Newbury meeting but was spotted by an observant Christine Northeast, for which I am very grateful.

REFERENCE

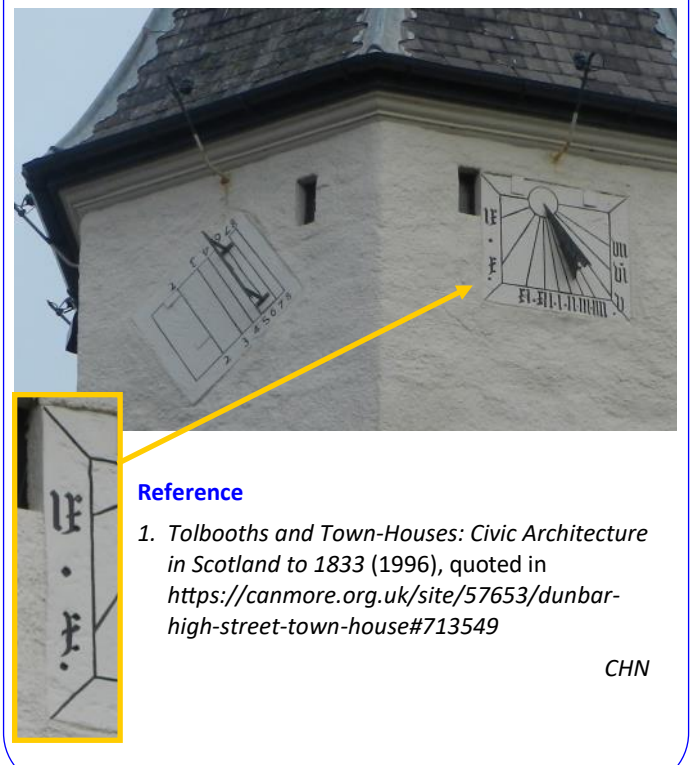
1. *http://vennottery.blogspot.com/2017/01/sundial.html*

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

Dunbar Dials

The Category A listed Dunbar Town House, built in the late 16th or early 17th century, was the town's tolbooth for civil administration; it is claimed that it is Scotland's oldest functioning Council Chamber.

Its attractive tower bears two dials, one direct-west-facing, and the other declining about 30° west of due south. The dials are recorded as having been painted by Alexander Mackbyth in 1686,[1] but their present excellent condition is due to extensive renovation of the building, completed in 2011. The inset below the main picture shows two of the unusual Roman numerals.



Reference

1. *Tolbooths and Town-Houses: Civic Architecture in Scotland to 1833* (1996), quoted in *https://canmore.org.uk/site/57653/dunbar-high-street-town-house#713549*

CHN

A THIRD DIY GARDEN HELIOCHRONOMETER

BRIAN HUGGETT

My article in the September 2017 edition of the *Bulletin*[1] described how I came to make an equatorial heliochronometer for my garden. At that time, I had never intended to build a second. Experience in operating the sundial, however, plus involvement with the British Sundial Society, led me to visualise significant improvements to the design and construction of Mark I.

A second garden heliochronometer thus appeared, as described in the March 2018 edition of the *Bulletin*.[2] Mark II incorporated a more effective way of correcting for the Equation of Time and for the BST/GMT transition. I had also developed better techniques – such as how to allow moving surfaces to slide smoothly.

I had never intended to make a third dial. Mark II demonstrated, however, that there were still advances to be made. In particular, Mark II was specific to my garden in that it incorporated no mechanisms to correct for other latitudes and longitudes. Also, a date scale could be added to a future dial. 'You're going to build another one, aren't you?' said my wife, as I pondered on the deficiencies of Mark II.

Below is a description of the key aspects of Mark III (Fig. 1), together with brief notes on improved approaches to its construction. For more details of the design and construction of Mark III – together with dimensioned photographs and the graphics files used for the scales – please see: *http://bit.ly/huhe03*. That webpage also includes a YouTube video in which I talk about the dial.

Fig. 1. Mark III.

Latitude

The base plate of Mark III is connected to the dial plate with hinges such that all latitudes within the British Isles can be accommodated. The angle itself is controlled with a brass screw jack, designed for a skylight window (Fig. 2).

Fig. 2. Base plate and dial plate.

The angle measured by the latitude scale (Fig. 3) is the co-latitude. The scale is calibrated directly for latitude, however, which is why the angle shown by the latitude scale increases as the actual angle that it measures decreases.

The Equation of Time (EoT)

I will describe the mechanism for the EoT correction prior to addressing the question of longitude because the EoT correction scales play a part in the longitude correction process.

The EoT correction for Mark III is effected in exactly the same way as for Mark II. The angular rotation of the time scale arc to correct for the EoT on a given day is achieved by the alignment of a pair of lines that are specific to that day. One line of each pair is located on the outer EoT scale, and the other line of each pair is located on the inner EoT scale which is attached to the top of the rotating time scale arc (Fig. 4).

Fig. 3. Latitude scale.

Fig. 4. Inner and outer EoT scales.

Fig. 5. Knob that controls movement of the time scale arc.

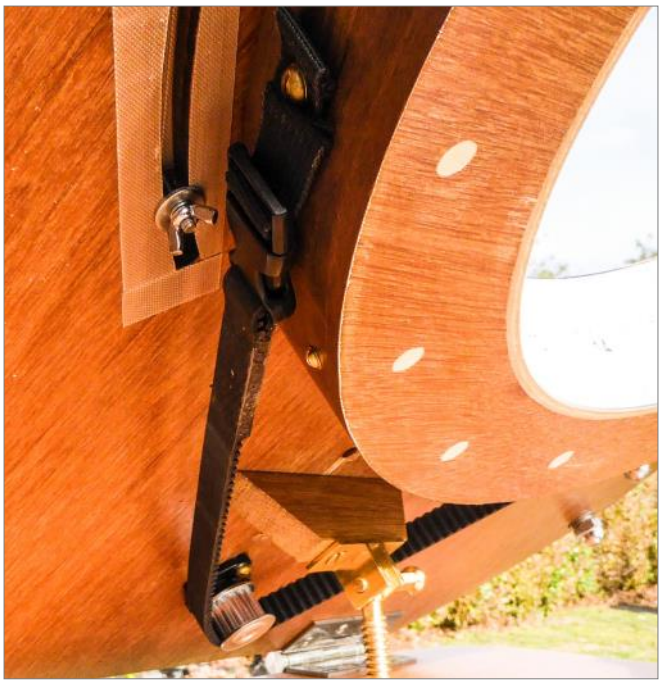


Fig. 6. Drive belt that moves the time scale arc.

In practice, the EoT correction requires a small, but accurate, movement of the time scale arc each day. This is effected by a centrally placed knob (Fig. 5), connected to a drive belt (Fig. 6) that moves the time scale arc.

British Summer Time

The above EoT correction mechanism requires alignment of two lines for each day. These lines are set at the correct angular displacement to compensate for the day's EoT correction. The location of one line-pair in relation to any other line-pair, however, is irrelevant as long as the final configuration does not make the scale difficult to read. Thus I was able to group all GMT dates on the east side of the sundial's longitudinal axis, and all BST dates are on the west side (Fig. 4).

Further details of the EoT and BST/GMT correction mechanisms are described in relation to Mark II in the March 2018 edition of the *Bulletin*[3] – and also on the above webpage.

Longitude

The angular spacings of time scale graduations are equal on an equatorial sundial. Fifteen degrees of arc always represent one hour. For this reason, a longitude correction can be effected by simply rotating the time scale arc by the longitude difference between the location at which the sundial is sited and the relevant time zone meridian.

My garden is at a longitude of 1.178° west of the Greenwich Meridian. This means that when it is solar noon on the Greenwich Meridian, it is 4.7 minutes before solar noon in my garden. Correcting my sundial to correspond with a simultaneous reading at Greenwich requires the time scale arc to be rotated 1.178° anticlockwise when viewed from the top of the dial plate.

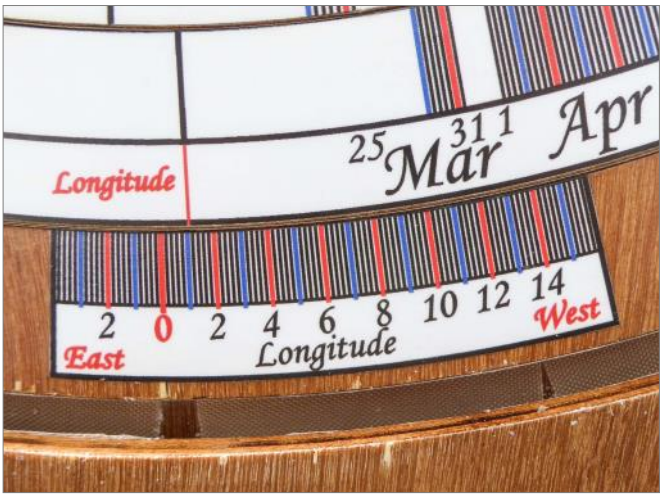


Fig. 7. Longitude scale.

The same principle applies for any other longitude. Locations west of the Greenwich Meridian require an anti-clockwise correction of the time scale arc (looking from the top of the dial plate) by the angle of longitude west of Greenwich. Locations east of the Greenwich Meridian require a clockwise correction of the time scale arc (looking from the top of the dial plate) by the angle of longitude east of Greenwich. The outer EoT scale is rotated by the angle required to compensate for longitude (Fig. 7). Thus, when the sundial is correctly adjusted for longitude, all EoT corrections will include the longitude correction.

The outer EoT correction scale would usually require very infrequent adjustment for longitude – only when the whole sundial was relocated. This scale is therefore held in place by two wing nuts, one of which is visible in Fig. 6.

North–South Orientation

There is no mechanism built into the heliochronometer to set the north–south orientation. An approximate north–south orientation can be achieved by the use of a compass or any other appropriate method. Owing to the accuracy of modern clocks, it is possible to align the sundial accurately by making all other relevant adjustments and then orientating the instrument such that it reads the expected time.

Fig. 9. Nodus.

The Date Scale

The date scale graphic is shown in Fig. 8.

Because of the changing solar declination throughout the year, a shadow cast by a nodus (Fig. 9) onto the scale can indicate the date. This nodus shadow moves parallel to the dial plate during the day as the sun appears to move across the sky, and so a static date scale would need to be wide; otherwise it would be useable for only a portion of the day. Also the movement of the nodus shadow during the course of the year – from its highest point to its lowest point, and then back again – means that the calibrations on a date scale can become very confusing to read.

My date scale attempts to minimise both of the above problems by being able to move in an arc across the dial plate, as visible in Fig. 1. The scale can thus be positioned

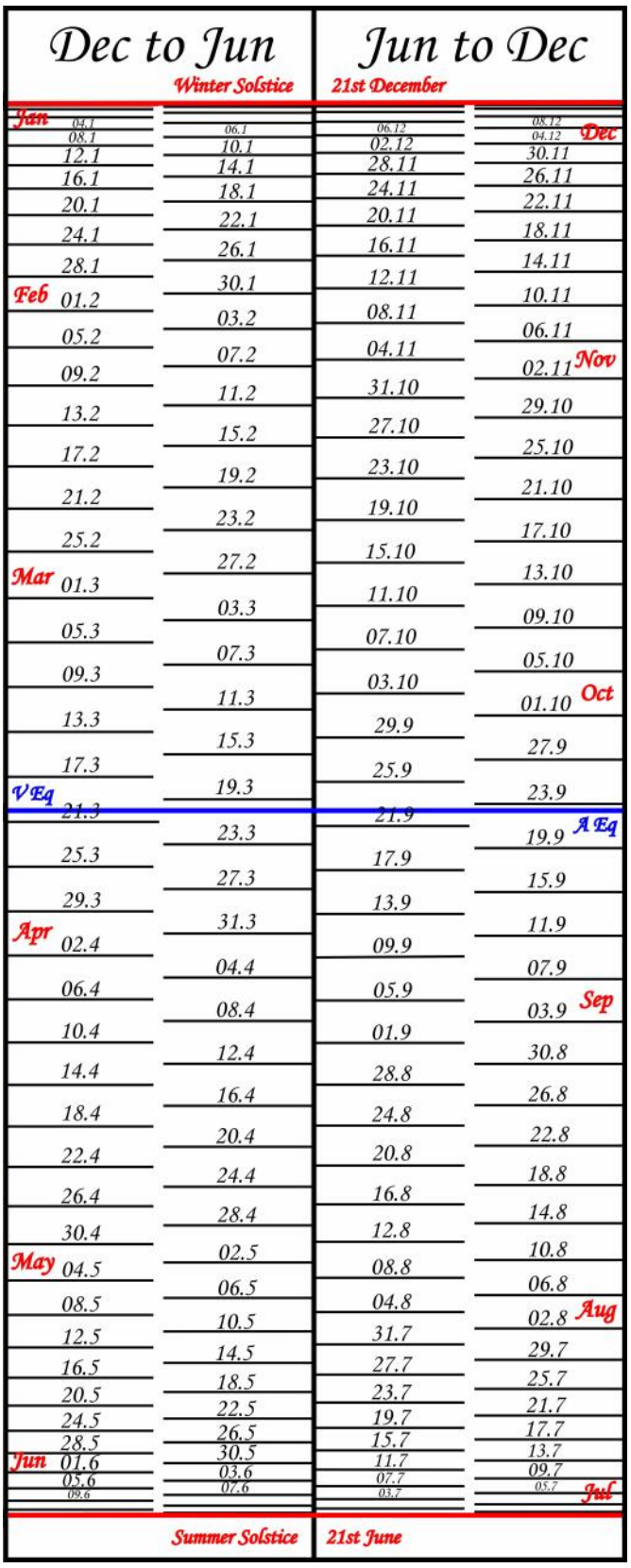


Fig. 8. Date scale graphic.

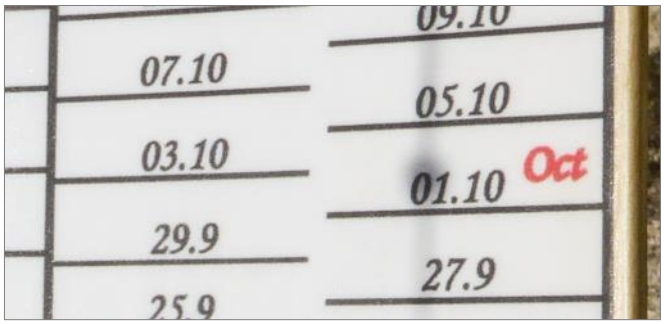


Fig. 10. Nodus shadow on the date scale.

Fig. 11. Back of the date scale.

so that the nodus shadow falls on any point within the width of the scale. This has allowed the scale to be fairly narrow, and has also meant that dates from June to December can be separated from the December to June dates in order to improve readability.

Fig. 10 shows the nodus shadow on the date scale for 2 October.

In practical use, the date scale must be moved frequently and quickly. It does not, however, require to be positioned with a high degree of accuracy. It is therefore moved by directly pulling it around its track with the knob shown in Fig. 11.

Owing to the variation in the time of the vernal and autumnal equinoxes, no date scale can ever be totally accurate from year to year.

I am indebted to Dr Frank King, Chairman of the British Sundial Society, for describing an approach for designing a date scale of 'best fit' that is intended for use over many years. This is the approach that he used in his design of the sundial on the London Stock Exchange (SRN 5355) and is also the approach that I have adopted for Mark III.

The information required from the method is simply the declination to be used for each date line on the scale. Thereafter, the positioning of each date line is a matter of simple trigonometry.

Method for Calculating Declinations for the Date Scale

1. Decide upon a notional design life for the scale that spans a multiple of 4 years.
2. Select a period of that duration which begins with a leap year.
   I have considered 36 years from 2020 to 2055.
3. Select a year in the middle of the range, and identify the date and time of the vernal equinox for that year.
   My chosen year was 2038, and the vernal equinox in that year occurs at 12:40 GMT on 20 March.
4. If the chosen year is not a leap year, identify the next leap year on which the vernal equinox falls on the same date and at around the same time.
   2038 is not a leap year. The next appropriate leap year is 2104 when the vernal equinox occurs at 12:15 GMT on 20 March.
5. Use, for the scale, the declinations at 12:00 from 1 March on that leap year to 28 February on the following year.
   The declinations I used were all for 12:00 on dates from 1 March 2104 to 28 February 2105.

Levelling

The sundial stands on three adjustable feet, designed for use with furniture (Fig. 12). Having three points of support allows any object to stand on uneven surfaces. It also simplifies the levelling process.

The horizontal attitude of the base plate is checked with a spirit level that is designed for record player turntables. The spirit level is fixed to the base plate of the sundial (see Fig. 2).

Plinth

The plinth for the sundial is shown in Fig. 13. It includes a hole in the top plate to allow the operation of the screw jack that effects the latitude adjustment of the sundial.

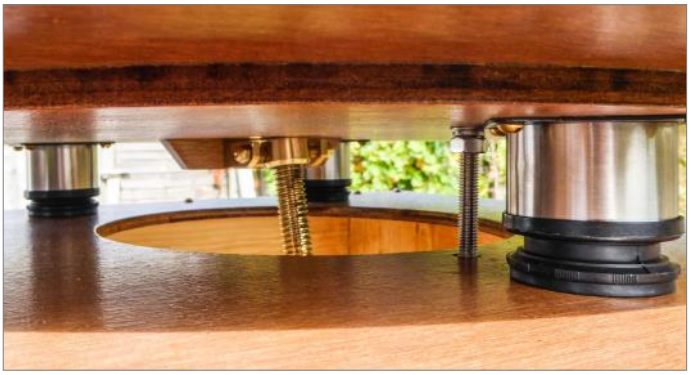


Fig. 12. Adjustable feet.

Fig. 13. Plinth.

Scales

I designed and drew all the scales, but they were commercially printed on self-adhesive vinyl. Vinyl is durable and, in particular, the printing does not fade in sunlight. It also allows colour to be incorporated in the design.

The Gnomon and its Supports

The design of the gnomon supports is derived from that of microphone booms. These allow as much adjustment of the gnomon position as is required.

The correct positioning and alignment of the gnomon is achieved with a gnomon alignment tool that attaches to mounts which are part of the sundial's structure. Fig. 14 shows the gnomon alignment tool fixed to the mounts on the dial plate.

When the gnomon alignment tool is mounted, the gnomon is positioned by adjusting the gnomon support booms such that the gnomon string is in contact with the line on the face of the alignment tool (Fig. 15). A rebate in the tool allows positioning of the nodus, and also allows the gnomon string to lie flat on the alignment line.

The gnomon is made from 0.8 mm diameter Kevlar string, as used for stunt kites.

Location of Gnomon Supports

The design of Mark III is such that the gnomon supports are attached to the top and bottom of the dial plate on either side of the longitudinal, north–south, axis of the instrument. It is important that such structures will never cast a shadow on the time scale.

The circumstance between the autumnal and the vernal equinoxes is straightforward. At the equinoxes, sunrise is due east and sunset is due west. Between the autumnal and

Fig. 14. Gnomon alignment tool fixed to the mounts on the dial plate.

Fig. 15. Face of the gnomon alignment tool.

vernal equinoxes, the sun shines from below the plane of the dial plate in the northern hemisphere and neither rises north of due east nor sets north of due west.

Structures that protrude below the plane of the dial plate must simply lie to the north of a line running east–west which passes through the gnomon.

The situation in the northern hemisphere in summer is more complicated because the sun rises north of due east and sets north of due west, with the maximum angles, north of east and north of west, occurring at the summer solstice on 21 June.

The exact manner in which these maximum angles were calculated for Mark III is detailed on the webpage quoted previously.

In addition to this, no part of the gnomon support structure that lies at less than these maximum angles must cast a shadow on the time scale. Such elements of the gnomon supports must therefore be set at a distance, at right angles to the plane of the dial plate, that takes account of the sun's maximum declination of 23.44°.

Reading of the Time Scale – Throughout the Year and Near Equinoxes

It can be seen in Fig. 1 that the time scale is positioned at right angles to the plane of the dial plate. This allows the time scale to be easily read, from above, throughout the year. In addition, the time scale annulus is absent for the section that would represent the period from 21:00 to 06:00. This allows the time scale to be read from 9:00 to 18:00 on days close to an equinox, when the sun is near alignment with the plane of the Earth's equator – and thus near alignment with the plane of the instrument's dial plate. These are periods during which a time scale that was a complete annulus, as Mark I, would be in its own shadow. Fig. 16 shows the shadow of the gnomon on the time scale at around 14:22.

Looking from the Earth, the Sun has an angular diameter of 0.5° – an angle equivalent to two minutes on the time scale of an equatorial sundial. My gnomon is 0.8 mm in diameter, and one minute on the time scale is 0.85 mm in width. The width of the shadow cast by the gnomon onto the time scale, therefore, is around the equivalent of the minimum possible two minutes.

An estimate of the centre of the shadow can be made to improve accuracy to within one minute of clock time.

Rotation of the Time Scale Arc and Other Moving Parts

A dry, varnished surface sticks to another dry, varnished surface if they are in contact for any period of time. This adhesion is not great, but it makes for a stiff or jerky beginning to any adjustment. All surfaces that move against other surfaces on this sundial are therefore covered with self-adhesive PTFE tape.

Fig. 16. Shadow of the gnomon on the time scale.

Cutting Circles

Circles for my previous two sundials were cut using a jigsaw, mounted in a homemade jig. Such an arrangement was prone to inaccuracy owing to the jigsaw blade wandering.

All circles and slots for Mark III were cut with a router which allowed near-perfect circles.

Materials and Protection from the Elements

Most of the wood used in the sundial is 9 mm marine plywood. The curved surfaces on which the time scale and the date scale are mounted are made from 5 mm flexible plywood. This is plywood constructed of layers whose grain all lies in the same direction. This allows the sheets to be very easily bent to a curve, and avoids the complications of creating curved surfaces that I encountered during construction of the previous two sundials. All fittings were brass, stainless steel or aluminium. As previously, between three and five coats of clear varnish were applied to all surfaces.

The Guide Spacer and Other Features

This article inevitably omits design and construction details that are included on the webpage for Mark III. One additional hidden feature I will mention here, however, is the guide spacer, for which I discovered the need when building Mark II.

The drive belt is attached to the time scale arc below the bearing surface on which it slides and rotates. This creates a slight downward pull on the time scale arc, leading to small vertical rotation that tends to lift the edge of the time scale arc at the curve on which the inner and outer EoT scales meet.

Fig. 17. Time scale arc.

The black, rectangular guide spacer, visible in Fig. 17, gently touches the underside of the bearing surface on which the time scale arc slides and rotates. It thus prevents the unwanted lifting of the time scale arc.

Holes in the melamine veneer for rainwater drainage are visible in Fig. 17, as are the pillars that provide attachment points for the melamine veneer, the drive belt and the guide spacer.

REFERENCES

1. B. Huggett: 'A DIY garden heliochonometer', *BSS Bulletin* 29(iii), 36–40 (September 2017).
2. B. Huggett: 'A second DIY garden heliochonometer', *BSS Bulletin* 30(i), 28–32 (March 2018).
3. See ref. 2.

For a portrait and CV of the author, see *Bulletin* 29(iii), September 2017. He can be contacted at *brian.huggett@gmail.com*

A NEW SUNDIAL FOR A NEW SCHOOL

DAVID BROWN

The Abbot Alphege Academy (Fig. 1) is a new Church of England Primary School on the top of Lansdown, a hill to north of Bath, and one of seven that surround the city. It has been built on the site at Ensleigh which was previously occupied by a section of the Ministry of Defence (Admiralty) and is part of a housing development by Linden Homes. The Academy is linked by a Trust to Weston All Saints Primary School (WASPS) whose Executive Head Teacher is Dr Anne Bull OBE who is a National Leader in Education and in 2012 won the Primary Headteacher of the Year in the national Pearson Teaching Awards. Amongst other aims, the school celebrates its own heritage, so when I was invited by Dr Bull and the governors to create a sundial for the school it needed to celebrate the person whose name the school takes as well as being an enjoyable educational tool.

Fig. 1. Abbot Alphege Academy, Bath (photo courtesy of Abbot Alphege Academy).

Fig. 2. The new sundial (with a shadow from a nearby lamp-post).

Abbot Alphege was born in the nearby village of Weston, now part of Bath, in 954 during the second major period of Viking raids against England. He became a Benedictine monk at a monastery called Deerhurst, near Tewkesbury in Gloucestershire, where he rose to become Abbot.

Fig. 3. Cardinal points, Bailey points, and stones naming personal qualities.

Fig. 4. The Alphege cross.

Fig. 5. Instruction plate.

Preferring a more austere life, he returned to Weston and became a hermit. His hermitage shelter and nearby well were less than a mile away from the site of the present school. His popularity amongst his followers grew and Alphege was eventually appointed Abbot of Bath. After holding the bishopric at Winchester from 984 he eventually became Archbishop of Canterbury in 1006 and was martyred at Greenwich in 1012, reputedly at the place that is now the site of St Alphege's Church. His body was later removed and taken to St Paul's Cathedral until the reign of King Cnut when, in 1023, it was returned to Canterbury, and buried in the Cathedral there. He was canonised in 1078.[1]

The sundial is of the conventional analemmatic type with a semi-major axis of 2 metres (Fig. 2). The hour points are laid out for summer hours with a correction for longitude. Cardinal points are included as well as the Bailey points that enable the user to find approximate times and directions for sunrise and sunset throughout the year (Fig. 3). A stone with 'Alphege' on it is adjacent to a cross (Fig. 4) whose pattern was taken from the foundation stone of the church of Our Lady and St Alphege, Bath, designed by Sir Giles Gilbert Scott in the late 1920s. Four stones are placed between the date scale and the hour points naming personal qualities from Alphege's life that the school advocates: courage, service, compassion and wisdom (Fig. 3). There is a stainless steel instruction plate mounted near the south edge of the dial (Fig. 5). All the sundial components are carved in Forest of Dean pennant sandstone, 5 cm thick, with incisions painted black, with the exception of the cross which is purple and gold. The spaces between the components are filled with brindle-coloured concrete paver blocks. The date scale has a quotation from

Fig. 6. Date scale and biblical quotation.

Fig. 7. Pointer stones.

Psalm 113 around its edge: 'From the rising of the sun to its setting the name of the Lord is to be praised' (Fig. 6). Places linked to Alphege's life are reflected in the sundial in the shape of seven pointer stones near the perimeter (Fig. 7). In addition to the sundial, a cave-like hermitage and a mock well adjacent to it were constructed in the playground by volunteers from two local parishes and with the support of the diocese (Fig. 8).

When the Bishop of Bath and Wells, The Rt Revd Peter Hancock, formally opened the school on 25 September 2018, I was pleased to see that the photograph recording this event showed not only the quotation that refers to sunrise and sunset but also shows the sunrise and sunset markers (Fig. 9).

Fig. 8. Hermit cave and well.

Fig. 9. The Bishop of Bath and Wells on the sundial at the official opening of the school. The mayor of Bath, Councillor Patrick Anketell-Jones, can also be seen in the background.

ACKNOWLEDGEMENTS

Grateful thanks to Richard Garforth, governor of the school, and two of my grandsons Ben and George Gough, all of whom who gave their time and effort in the construction of the sundial. Also to Matt Smail and his charitable landscape gardening outfit called "Grow Yourself" who constructed the base of the sundial.

REFERENCE

1. C. Shaw: *Our Lady and St Alphege, Bath. Sir Giles Gilbert Scott's 'Little Gem of a Church'*, St Alphege's Parish, Oldfield Lane, Bath, BA2 3NR (2012).

david@davidbrownsundials.com

SUNDIALS IN PARMA, ITALY

DOUGLAS BATEMAN

Parma, in the Emilia-Romagna region of northern Italy, has many claims to fame. One immediately thinks of Parma ham (*prosciutto di Parma*) and parmesan cheese (*parmigiano*). Architecture abounds, and as a group of tourists, we saw several of the churches and their artworks. Our walking tour ended in Piazza Garibaldi (Fig. 1) with the bonus of seeing the magnificent dials on the tower of the Governor's Palace (Fig. 2). This unique combination of bells, clock, noon dial and vertical dials must surely count as one of the world's top 100 sundials.

Regrettably we could not see the dials at noon because by then we had travelled to see a ham curing plant and to enjoy a tasting.

Fig. 1. The statue of General Giuseppe Garibaldi looking over the Piazza, with the dials behind.

The Governor's Palace (*Palazzo del Governatore*) was designed in its present form in 1760 by the French architect Ennemond Alexandre Petitot, and the Baroque tower was built in 1763. In 1829 Duchess Maria Luigia commissioned Lorenzo Ferrari and Luigi Pazzoni to create the large sundials on its façade.[1] The dials have been repainted several times since then: in particular, following the Second World War and again in 2006.

The Governor's Palace was the seat of the German Command during the last years of the Second World War. It was subjected to strafing by the Allies, and then, during the days of the liberation of Parma and Reggio Emilia, it came under attack by the Partisans. In their attempts to remove the *fasces*[2] that had been attached to the façade by the Fascists, the Partisans also hit and bent the gnomons. In 1946 a quick restoration of the dials was made, which almost certainly introduced some errors.[3]

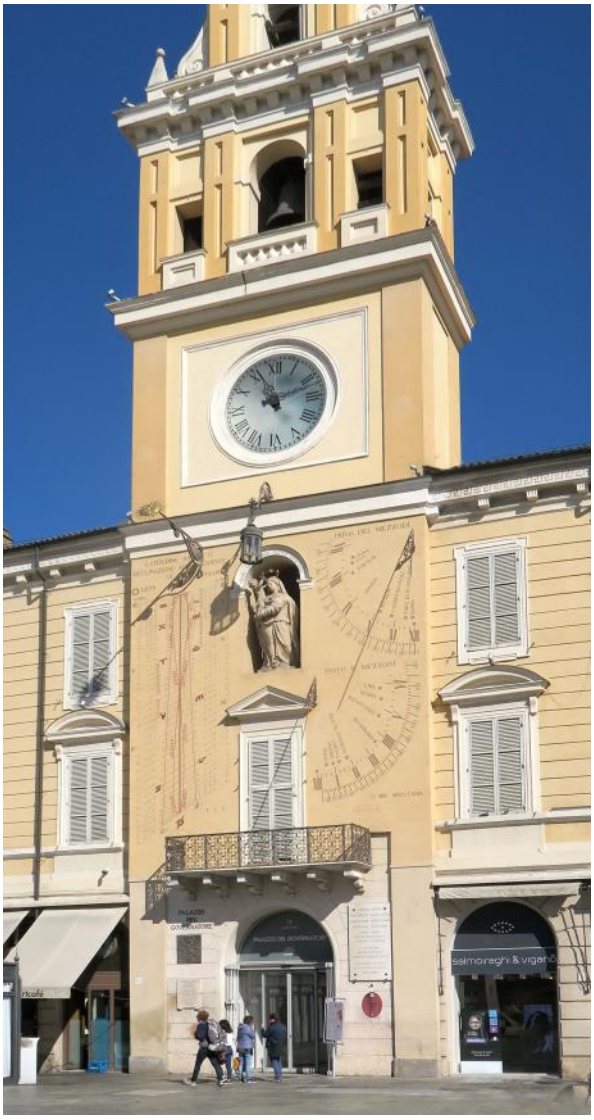


Fig. 2. The tower of the Governor's Palace, built in 1763, with bells, clock, two sundials and a statue of the Virgin Mary.

In 2006 a major restoration of the dials (including the gnomons and complete recalculation of all the figures on the curve of the analemma) was carried out by Renzo Righi, a talented designer, artist and restorer of sundials. A close-up of the dials is shown in Fig 3.

The Dials

To the right of the statue of the Virgin and Child there is a vertical dial split into morning (PRIMA DEL MEZZODÍ) and afternoon hours (DOPO IL MEZZODÍ), an arrangement that makes the best use of the space. These dials also show when it is noon at sixteen other places around the world.

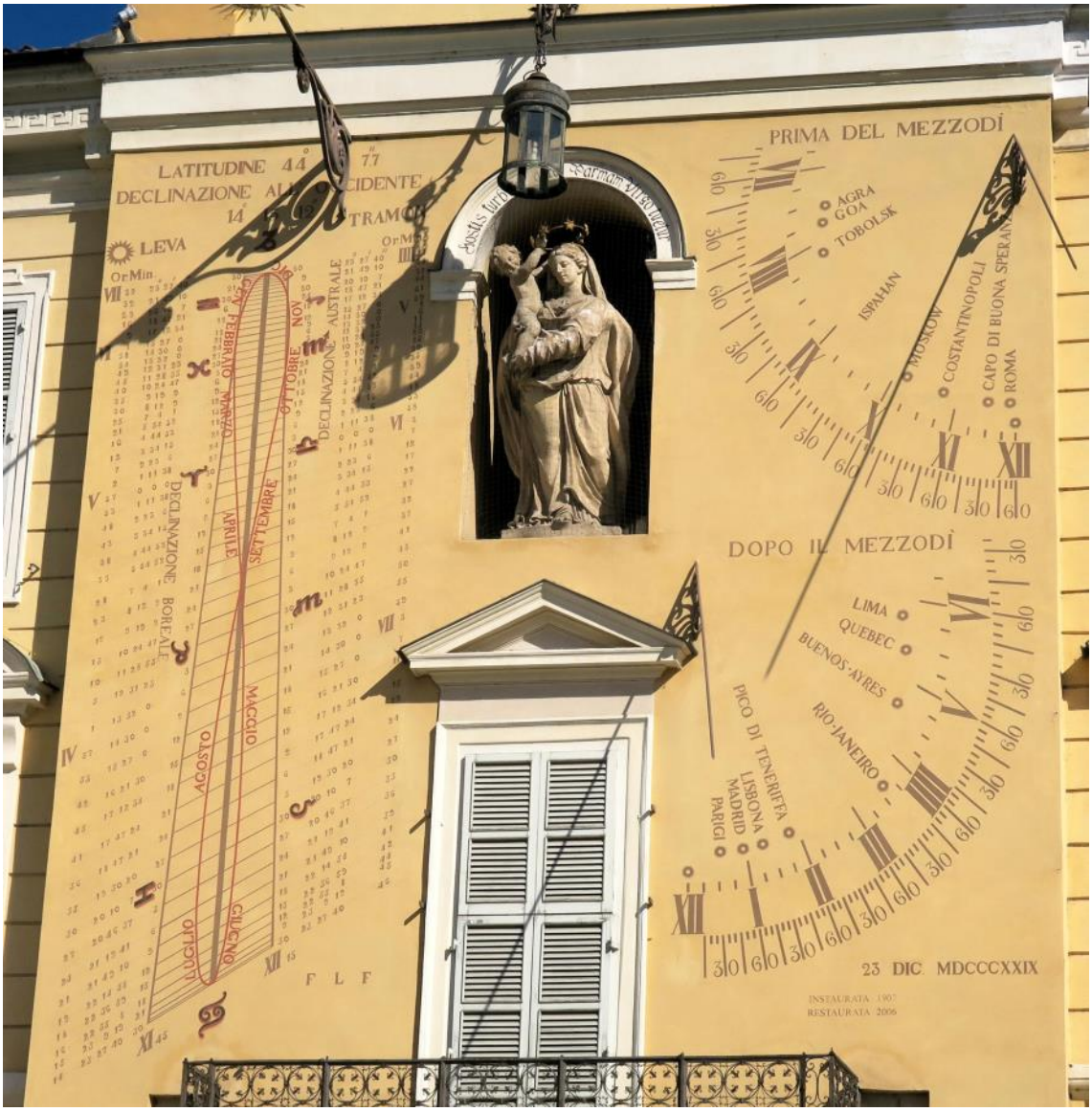


Fig. 3. The dials.

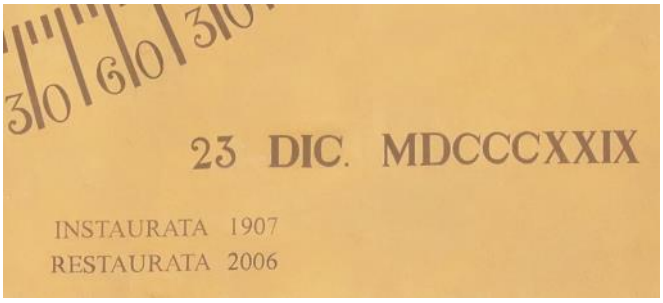


Fig. 4. A detail of the dates below the right-hand dials; below the noon dial are the initials F L F.

Three dates appear below the split dial (Fig. 4). The first, 23 DIC. MDCCCXXIX (23 December 1829), denotes the original installation date of the dials and below that are INSTAURATA 1907 and RESTAURATA 2006. The word 'instaurata' has a modern meaning of 'established' or 'founded' whereas in 1907 it also meant 'restoration' or 're-integration.' In other words, it means that the dial was restored in 1907;[4] it was restored again in 2006.

To the left of the statue there is a noon dial, with hour lines for XI.45 and XII.15 as well as for noon.

At the top, the latitude is given as 44° 48′ 7.7″ (extremely close to the GPS figure), and the declination to the west is given as 14° 15′ 12″. Next to the sun symbol is the word LEVA (*levante*, or sunrise) with below it a column of Roman and Arabic numbers for hours and minutes denoting the time of sunrise; on the right is TRAMON (*tramonto*, or sunset), again with a column for hours and minutes.

Running across the analemma are numerous constant-declination lines, each starting a quarter of an hour before noon and ending a quarter of an hour after noon. To gain an

Fig. 5. The equinoctial line flanked by the symbols for Aries and Libra.

understanding of the labelling of these lines, it is helpful to start with the equinoctial line which is easily identified since it runs roughly from the symbol for Aries on the left to the symbol for Libra on the right (see Fig. 5).

Each end of the line is labelled 30 which indicates the number of degrees round the ecliptic since the start of the previous zodiac sign. Thus the 30 on the left indicates 30 degrees since the start of Pisces whose symbol is higher up (see Fig. 3) and the 30 on the right indicates 30 degrees since the start of Virgo whose symbol is lower down. Each 30 also equates to 0 to indicate the cusp of a new zodiac sign. There are seven constant-declination lines with 30 at each end. Five of the lines link five pairs of zodiac symbols but the two 30s labelling the line at the top both refer to the first point in Capricorn and the two 30s labelling the line at the bottom both refer to the first point in Cancer. There are intermediate lines at three-degree intervals. These get very close together near the solstices and the labelling becomes more sparse.

Most lines are labelled not only with degrees round the ecliptic but also with two triplets of numbers corresponding to the associated solar declinations. The two columns of triplets are each headed ° ′ ″ for degrees, minutes and seconds. The two triplets for the equinoctial line are both 0° 0′ 0″. The column of triplets on the left is labelled DECLINAZIONE BOREALE to indicate that the declination is increasing: that is, the sun is heading north. These triplets refer to the winter-to-summer S-shaped half of the analemma which runs down the dial, in the same direction as one would naturally read the two words. The column of triplets on the right is labelled DECLINAZIONE AUSTRALE to indicate that the declination is decreasing: the sun is heading south. These triplets refer to the reverse-S-shaped half of the analemma which runs upwards. The analemma is further labelled with the names of the months written in red lettering.

Notice that the times of sunrise and sunset associated with the equinoctial line are not 6 am and 6 pm but V.57 and VI.3. The design is taking refraction into account and deeming apparent sunrise and sunset to be three minutes before and after geometric sunrise and sunset respectively.

The Dial Before and After the 2006 Repainting

Quite a number of years ago, when I was developing an interest in noon dials, I was fortunate to have seen reports about the Parma dials and, even more fortunately, I was able to get in touch with Giovanni Paltrinieri, the highly respected dial designer in Italy. This was in the days when 35 mm slides were needed for lecture purposes, and Giovanni very kindly took some slides for me. These were taken in 1997, and one is reproduced in Fig. 6. A similar photograph appears in his very handsome book on Italian sundials.[5] This enables us to make some interesting comparisons and comments. I assume that, when the dial was restored in 2006, the whole palace was repainted in a uniform style (Fig. 1). The markings on the dials were repainted in a very light brown colour to match how they were believed to have been before the war, and this makes the lines less pronounced than they were in 1997. From a purely dialling point of view, I would have advocated maximum contrast and therefore stayed firmly with black.

The next observation is that in 1997 the signs of the zodiac were gilded. Another difference occurs in the corner with the dates. The slide shows that there was only one date: 23 DIC 1829. The year has now been changed from the Arabic form to MDCCCXXIX, and INSTAURATA 1907 and RESTAURATA 2006 have been added.

Fig. 6. A view of the dials before the 2006 restoration. Photo: Giovanni Paltrinieri (1997).

The labels DECLINAZIONE BOREALE and DECLINAZIONE AUSTRALE on the left-hand and right-hand sides of the noon dial were added at the time of the 2006 restoration.

It should be borne in mind that the slide of 1997 shows the dials as they were after the quick restoration in 1946 to repair the damage caused during the war. The most important difference relates to the numbers on the curve of the analemma: Renzo Righi re-calculated the positions of all the numbers, correcting more than thirty of them.[6]

All in all, this is a wonderful combination of dials with a somewhat chequered history.

ACKNOWLEDGEMENTS

I am grateful to Giovanni Paltrinieri for the slide reproduced as Fig. 7 and to Gianni Ferrari and Renzo Righi for information about the recent history of the dials.

REFERENCES

1. *https://it.wikipedia.org/wiki/Palazzo_del_Governatore_(Parma)*
2. *Fasces:* symbol of Fascism in Italy under Benito Mussolini. It had been an ancient Imperial Roman symbol of power carried by *lictors* in front of magistrates, and was a bundle of sticks featuring an axe, indicating power over life and death.
3. Renzo Righi, via private communication to Frank King from Gianni Ferrari (October 2018).
4. Gianni Ferrari: private communication to Frank King.
5. Giovanni Paltrinieri: *Meridiane e Orologi Solari d'Italia*, l'Artiere Edizionitalia (1997).
6. See ref. 3.

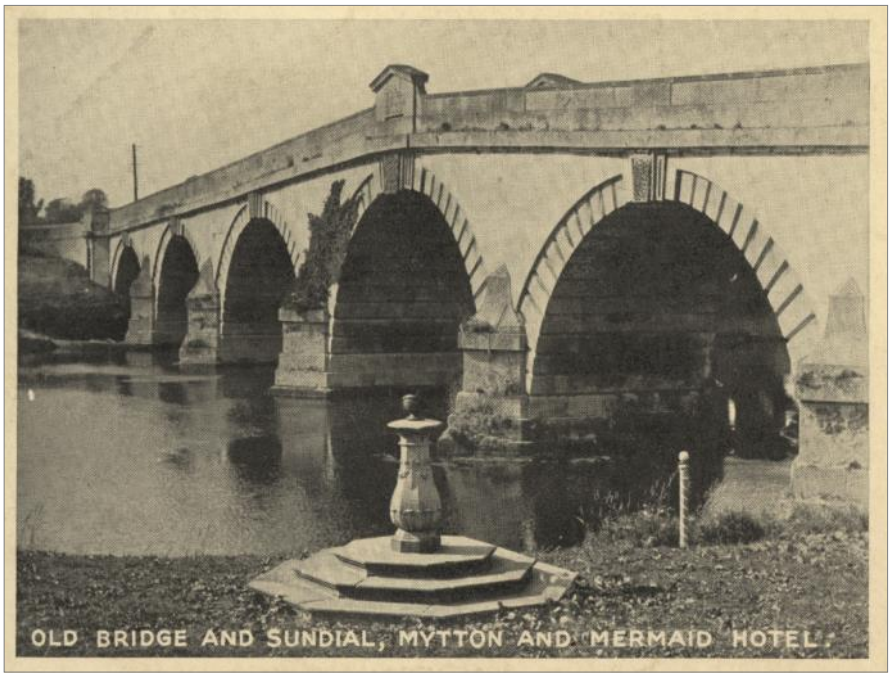
douglas.bateman@btinternet.com

Postcard Potpourri 46

The Mytton and Mermaid Hotel, Atcham, Shrewsbury

Peter Ransom

This is only the second postcard I have that features a Pilkington & Gibbs heliochronometer. (The first is the BSS one published a couple of decades ago.) Unfortunately, the dial itself no longer exists *in situ*: a search of images on the Internet of the Mytton and Mermaid Hotel shows the remnants of a dais, but no pillar or dial. The shape of these dials is so distinctive that I have no hesitation in identifying it. Those BSS members interested in Pilkington & Gibbs dials will be disappointed to learn that despite a very high resolution scan it is not possible to see any identification number!



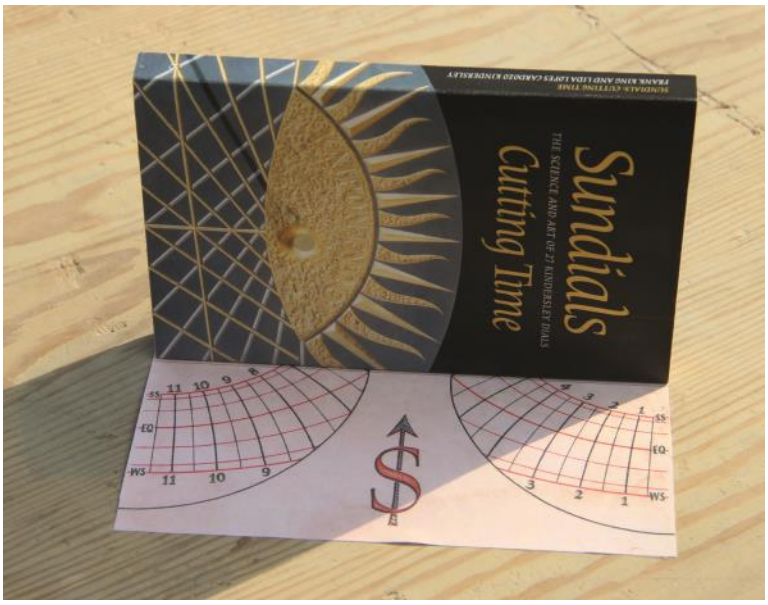
The hotel has had a varied history; its latest reincarnation was as a hotel after Clough Williams-Ellis bought it in the 1930s and that is its present function. It dates from the mid- to late 18th century. So, if any members visit the hotel, why not enquire what happened to the dial?

The postcard has no publication details and is not postally used, but the following is written on the reverse: *Stayed here en famille in June 1937 on way from Llandudno to Malvern*.

pransom@btinternet.com

BOOK REVIEWS (2)

Sundials: Cutting Time – The Science and Art of 27 Kindersley Dials by Frank King and Lida Lopes Cardozo Kindersley. ISBN 978-1-874426-23-3, 191 × 125 × 15 mm, stiff covers, 140 pp, 110 photographs, 50 drawings, 1 table. Published January 2019 by Cardozo Kindersley, Cambridge. RRP: £15 + P&P. Available from *www.kindersleyworkshop.co.uk/shop* where you can pay by PayPal, or from The Cardozo Kindersley Workshop, 152 Victoria Road, Cambridge, CB4 3DZ.



This is a beautifully produced book from the Cardozo Kindersley Workshop. It shows the 27 sundials that have been made in the workshop over the last 80 years.

In the preface there is a picture of an Eric Gill dial. David Kindersley was apprenticed to Eric Gill (sculptor, letter carver, engraver) and later became Gill's assistant in the 1930s. In 1945 DK set up his workshop in Cambridge. The City is now home to a good many talented letter carvers but back then DK was one of very few in the whole country.

DK's first dial was made in 1938 and it is interesting to see what has and has not changed in his and the workshop's approach to lettering and design over such a length of time. A major influence on the workshop, and one that has kept it right up to date, is Lida Lopes Cardozo Kindersley. She joined the workshop in 1976 as an apprentice and later on married DK. Lida has continued to run the workshop since 1995 when David died.

Frank King, our chairman, is a Cambridge man who has worked with the Kindersleys since 1980 when he delineated a pair of vertical dials that were mounted on the south-east corner of a house.

There are four sections in the book: The Science, The Making, The Art and The Language.

In *The Science* section Frank explains how sundials 'work'. His clear text and diagrams (no equations) are ample for an interested reader new (or not so new) to the subject to understand why the lines of different dials are arranged the way they are. Frank explains equal and unequal hours, Babylonian and Italian hours, mean time, constant-declination lines, the works. Maybe one day we could persuade him to add the equations and then we might have a modern 'Sundials, their theory and construction'.[1]

The Making section has a short piece by Lida about the workshop's design process but it is mainly a photographic record of the Selwyn College dial[2] being made. It shows Frank and the workshop team setting out the dial then the carving, painting and gilding along with the necessary carrying, scaffolding and drilling for its installation.

In *The Art* section each dial is illustrated with pictures of the finished sundial. Some dials are accompanied by design sketches and drawings, others with pictures of their making and installation. It is interesting to see a dial's design change from sketch to finished piece.

Frank describes each dial: hours shown, sunbursts, gnomon type, arrangement of numerals, noon gaps etc which should help the reader to notice a lot about each dial's design and also what to look for in other dials found in the wild.

The last section, *The Language*, is a good glossary explaining all the terms used in the book.

Look closely at the 'italic' letters on dial 13. The letters slope backwards on the left and forwards on the right hand side with no slope in the centre of the dial. For various reasons it is almost impossible to make regular italic letters set out on a curve look right. This is an interesting and uncommon solution.

The 27th sundial is the book itself thanks to a stereographic projection on the end flap and Frank King's imagination. This is a lovely touch to a lovely little book.

References

1. A.E. Waugh: *Sundials, their theory and construction*, Dover Publications (1973).
2. F.H. King: 'A new Babylonian and Italian Hours sundial for Selwyn College, Cambridge. Part 1. Design and Construction', *BSS Bulletin*, 22(iii), 2–8 (September 2010), 'Part 2. Numerical insights', 22(iv), 9–11 (December 2010).

Ben Jones

READER'S LETTER

Souvenir from Scotland

I purchased my first British timepiece over 35 years ago while on a short vacation to the UK – a sundial. After spending a few days in London, I hopped onto a train to see some of the North Country, finishing up in Edinburgh. It was there that I ducked into an antique shop to escape driving rain and first saw the sundial pictured in Figs 1 and 2, lying in an out-of-the-way corner. I was immediately smitten. With price negotiated, the problem became how to get this 40+-pound souvenir back home to the States. I returned with my backpack later in the day, fastened a cardboard box to protect the gnomon and carefully packed it into the backpack surrounded by clothes for further protection. At Heathrow the next day, the airport security screener called his pals around to see the crazy American that had a 'brick' in his carry-on luggage. Times have sure changed since then.

From what I remember, the proprietor said that it came from the 'Isle of Fife' in Scotland but didn't know much more about it. Its origins have been a mystery to me until last year when I met Douglas Bateman, FBHI, at the 2018 Antiquarian Horological Society Annual Meeting at Keele University. Half the fun of attending events is networking and sharing stories and I was obviously lucky to be sitting next to one of the foremost experts on dials. Doug conferred with Scottish expert Dennis Cowan who was able to provide more information about the dial that I thought would be of interest to readers.

Fig. 1. Front view of the dial. Inset: the cross patty.

Fig. 2. The back of the dial.

I learned that there is no such place as the Isle of Fife, but it could be that East Neuk of Fife or more likely the Howe of Fife was what was meant. Cowan explained that a cherub's head with wings was fairly common during the latter half of the 17th century whilst a representation of the flower below represents rebirth and was more common on gravestones during the early 18th century but was sometimes seen on sundials. The numerals and the cross patty at the noon position are typical of the 17th century. The gnomon appears to have been replaced many years ago. Its angle is difficult to see; however, an inspection of the angles of the hour lines indicates that it is good for between South of Edinburgh and Dundee. Fife sits between the two so it is entirely possible that it came from Fife. All considered, it appears that this sundial dates between 1660 and 1720 but leaning towards the earlier.

Richard Newman, Chair, NAWCC
DeKalb, Illinois, USA
rpnewman@yahoo.com

TRUSTEES' ANNUAL REPORT 2018–19

The Society has reached another significant milestone – its 30th anniversary. In that time we, members past and present, have established the Society as the foremost authority on all aspects of sundials. Our ongoing challenge, in an ever-changing world, is to maintain that interest and status.

During 2018–19 the Society's continuing core activities (including the *Bulletin,* annual conference and Newbury meeting) and infrastructure (including the website and dial registers) were again successfully delivered and maintained. In addition, it was possible to tackle some of the mounting backlog of publication projects. The Society's finances remain capable of supporting current activities and plans for the foreseeable future.

Last year witnessed yet again the astonishingly broad front on which the Society and its members are active. Examples are listed, as encapsulated in our recent public benefit submission to the Charity Commission, in the annex below.

With regard to publications, priority continues to be given to the regular issuance of the quarterly *Bulletin* – and that alone accounts for the majority of the Editorial Team's time and effort. Nevertheless, for the first time a national *Mass Dial Register* was published (DVD and print) in 2018, and a substantially revised third edition of the *Biographical Index* has been completed for publication in 2019. The DVD of past *Bulletins* is being updated and will be published, on memory stick rather than DVD, during 2019.

Stock is low of many BSS publications. Unfortunately, for a combination of reasons, issuing a reprint is not just the simple matter of pushing a button that many, if not most, might envisage. It is a bit more complicated and in-house editorial resources remain heavily constrained. Work has however commenced on preparing a new edition of the *BSS Glossary.*

The Help and Advice service, advertised on the home page of the website, continues to prove to be a successful innovation. It is the ideal way to direct the Society's knowledge and know-how to specific enquiries from individuals plus provide source material for *Bulletin* articles.

The entirety of the Society's activities, front and back office, are undertaken on a voluntary basis by members. The trustees thank, on the collective behalf of the whole Society, all those who volunteer. This year witnesses, with the passing of Jill Wilson and the retirement of David Brown, the loss of two stalwart volunteers of long standing. On the gain side it is much appreciated that John Wilson has taken on the rôle of mass dial registrar, and Louise Smail volunteered to join the 2020 York Conference Team. As ever, we are limited to the volunteer resources we have available. If you feel able to help in any way, we would love to hear from you.

More detailed information is annexed below.

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

ANNEX

Public Benefit Activities

Examples include:

- The Help and Advice Service (accessed through the website) fielded 64 enquiries from the public, each necessitating research and often reference to a specialist. Enquiries related to public and accessible sundials (42%); history and function of private sundials (50%); and software, publications and other subjects (8%).
- Illustrated talks were given at Burton Lazars village hall to 40 people and the Ilchester Historical Group to around 20 people.
- Technical advice was given to South Somerset District Council on the reconstruction of a damaged ancient monument.
- Investigation of a sundial suggested to originate from Kirby Hall (English Heritage).
- Negotiated with Bromley House Library for improved visitor access to the Society's Library.
- Research findings on a particular local sundial were shared with its community in the Cities of London, Norwich, and York; Ambleside, Cumbria; Lumbutts and St Michael-on-Wyre, Lancashire; Brant Broughton, Lincolnshire; Holloway, London Borough of Islington; Tollesbury, Essex; and multiple locations in Scotland.
- At the Livery Link Showcase held in the London Guildhall, the Society supported The Clockmakers Company's industry training presentation, as part of the careers and support exhibition attended by 950

young people and their teachers. Engagement in horology and science was made through explanations of how sundials work, and distributing printed cards enabling the construction of an operational sundial.

- Historical and metallurgical advice was given to the National Museum of Science & Industry regarding a scientific instrument in their collection.
- The ongoing digital mapping of sundials in the British Isles was expanded to enable members to be Citizen Scientists reporting extra data for the national database.
- Publication of a *Mass Dial Register*, distributed to the Legal Deposit Libraries. This is a unique reference of early time indication in the British Isles.
- Appearance on BBC Radio Scotland to explain the astronomy and effects of the winter solstice.
- The Society's website has identified over 8000 visits from members of the general public.

The *Bulletin*

The four quarterly issues of the *Bulletin* were published in 2018 with the September issue being slightly on the thin side, a consequence of receiving relatively few items to publish. Happily there was almost an over-supply of items for the December issue.

The *Bulletin* Team includes John Davis, Frank King, Christine Northeast and Bill Visick, with invaluable help from Fiona Vincent who proof-reads every issue. David Brown is also on hand, and, recently, Kevin Karney has undertaken some editing too. We are very grateful to all our contributors.

The Editorial Team

The *Biographical Index* and the *BSS Glossary*

Ten years after the publication of the second edition of the *Biographical Index* in 2007, preparations were made for bringing a greatly expanded third edition to fruition. Sadly, Jill Wilson's ill-health meant that the work of copy-editing and layout proceeded slowly and with difficulty, but was completed at the end of 2018, for publication in 2019.

New material for the *Biographical Index* continues to trickle in from members and the Society very much needs someone who can maintain these records.

Work has recently started on recreating the second edition of the *BSS Glossary* for which there continues to be a steady demand. Progress has been made, but the task has been hampered by the lack of an immediately usable electronic version.

All our publications are prepared electronically and several are published electronically. It has been suggested that we need a volunteer who can serve as a digital archivist/ librarian.

Christine Northeast

Fixed Dial Registrar

The *Register* now holds 7,507 dials (88 per cent with photographs), supported by 11,664 reports. New dials come in at one a week on average, split about equally between high-quality newly-made dials and good 17th- to 19th-century dials which had not previously been recorded.

An update to the 2015 DVD *Register* was published, showing 176 dials newly reported since then. It was of interest to see the number of quality dials that are still being reported for the first time, and it was also designed for dial hunters wondering whether their latest sighting is really a new one.

The *Mass Dial Register* was published on DVD and in print as an Abridged volume, in the same format as the *Fixed Dial Abridged Register*. [John Foad edited the *Mass Dial Register* in the Tony Wood – John Wilson interregnum].

An improved and simplified version of the Registrar's Access program has been created, with all input, searching and editing done through two screens, and direct access to all scanned reports (previously spread over several screens).

John Foad

Sales

Sales continue to be slow but steady, though Christmas sales were disappointing for 2018. The trustees are examining the reprinting of publications where we have either little stock or no stock at all.

Elspeth Hill

Website

The website continues as one of the most popular sundial sites on the web and has shown recent growth in visitor numbers and activity. BRIDOL, the list of makers, the BSS horizontal dial, and How Sundials Work continue to be the most popular areas and there is strong interest in mass dials, the *Bulletin,* and Help and Advice. As ever, more contributions would be welcome so please contact the webmaster with any material or suggestions.

Bill Visick

Help and Advice

It has been another very busy year for the Help and Advice Service. As well as receiving enquiries from the general public, the Service has been contacted by professionals such as landscape planners, archaeologists, museums, schools, churches and charities.

Around 30 per cent of enquiries are from overseas; those from Canada and the USA are passed to the North American Sundial Society for resolution.

The Service not only directly benefits those who make use of it but it has also lead to the discovery of previously unreported dials, several articles in the *Bulletin* (for example, see pages 12–13 of this issue) and a talk to the

Abingdon branch of The National Trust. The Service is one of the principal ways in which the Society fulfils its mission statement.

Grateful thanks to the many members who are called upon to support the Service, in particular Mike Cowham, John Davis, John Foad and Frank King.

Sue Manston

Conferences

The 2018 conference was successfully held in Norwich. The 2019 conference, in recognition of both the Society's 30th anniversary and the richness of Bath as a location, is to hold additional outings on the Sunday morning. The 2020 conference will be in York, and a venue has been contracted for.

Conference fees have, with the aim of encouraging attendance, remained unaltered since 2015. This has proved possible, despite the general cost and price inflation in the hotel/conference venue sector, by booking well ahead, negotiating hard, and managing the contract. Pleasingly, attendances have firmed up to 55–60 delegates in the last couple of years.

The core conference team comprises Doug Bateman (lecture programme), Bill Visick (IT), plus Liz and Chris Williams (who, between them, do everything else). The permanent team requires, for each conference, a temporary local member to advise on potential venues and arrange visits.

David Brown kindly volunteered to join the team for Bath (2019) and Louise Smail for York (2020).

Volunteers are required for 2021 and 2022. The role is not onerous, and you would not, repeat not, be in any way responsible for *the* conference. If you would like to help and have ideas for future locations/venues, we would love to hear from you.

The Conference Team

Mass Dial Registrar

Having recently volunteered, I am getting to grips with the Society's collection of mass dial records painstakingly collected by members. About half of these have to date been digitised, and a selection of these were recently published in the *Mass Dial Register* edited by John Foad.

Looking to the future, ideas include:

- continuing to digitise recordings;
- listing medieval churches where no mass dial has been recorded;
- reviving interest in the Mass Dial Group; and
- encouraging members to continue to search for mass dials and to record null results.

John Wilson

Library

Bromley House in Nottingham, which houses the Society's Library, is undergoing extensive renovations. Our Library, hitherto in the Thoroton Room, is therefore in temporary storage during the works. After the renovation our Library will be housed in the Standfast Room as the Thoroton Room is to be converted into a local studies centre. The Standfast Room, very appropriately, contains the Bromley House meridian line.

A full stocktake of the Library was conducted last January. All books and pamphlets are present and correct.

No new books were added to the collection during 2018.

John Wilson

Photographic

The photographic competition was held last year at the annual conference in Norwich. A total of 26 good-quality photographs were entered and judged by the delegates. As the competition is held every other year, the next will be in 2020.

Between times, for the Bath conference, it is hoped to provide an exhibition of photographs for each year of the Society's 30 years.

David Hawker

Membership

The mainly demographic/age related driven level of leavers continues to outpace new joiners – albeit at an attenuated rate in recent years. Current membership stands at 309, made up of 222 in the UK, 43 in mainland Europe, and 44 in the rest of the world.

In order to reduce the cost of postage, paper, etc, subscription renewal reminders will be sent by email. The efficacy of the change will be reviewed after a year.

Jackie Jones

Treasurer

The Society's 2018 accounts begin on the next page.

Graham Stapleton

BSS ACCOUNTS FOR THE YEAR

THE BRITISH SUNDIAL SOCIETY
(CHARITABLE INCORPORATED ORGANISATION)

LEGAL AND ADMINISTRATIVE INFORMATION

CHARITY NUMBER 1155688

LEGAL FORM Charitable Incorporated Organisation formed under the Charities Act 2011.

START OF FINANCIAL YEAR 1st January 2018

END OF FINANCIAL YEAR 31st December 2018

TRUSTEES AT 31ST DECEMBER 2018

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

GOVERNING INSTRUMENT Constitution as incorporated 7th February 2014.

OBJECTS The advancement of the education of the public in the science and art of gnomonics.

CONVERSION TO CIO The members of the unincorporated charity British Sundial Society (former registered charity number 1032530) agreed at the April 2014 AGM that the Society become a Charitable Incorporated Organisation (CIO).

The British Sundial Society (CIO) was formed and registered as a charity on the 7th February 2014 (registered charity number 1155688) and took over all the activities of the former British Sundial Society from the 8th August 2014.

CORRESPONDENCE ADDRESS
The British Sundial Society
99 Western Road
Lewes
East Sussex
BN7 1RS

PRIMARY BANKERS
The Co-operative Bank plc
PO Box 101
1 Balloon Street
Manchester
M60 4EP

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

ENDED 31ST DECEMBER 2018

INDEPENDENT EXAMINER'S REPORT ON THE ACCOUNTS

Report to the trustees/members of the British Sundial Society on the accounts for the year ended 31st December 2018 which have been set out on pages 46 to 52.

Respective responsibilities of trustees and examiner

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

It is my responsibility to:

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

Basis of independent examiner's statement

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

Independent examiner's statement

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

(1) which gives me reasonable cause to believe that in any material respect the requirements:

- to keep accounting records in accordance with section 130 of the 2011 Act as amended; and
- to prepare accounts which accord with the accounting records and comply with the accounting requirements of the Act have not been met; or

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

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

Dated: 26th February 2019.

THE BRITISH SUNDIAL SOCIETY
(CHARITABLE INCORPORATED ORGANISATION)

STATEMENT OF FINANCIAL ACTIVITIES FOR THE YEAR ENDED 31ST DECEMBER 2018

	Notes	Unrestricted Funds £	Restricted Funds £	Total 2018 £	Total 2017
INCOME					
Donations and legacies	**3a**	1,464	0	1,464	1,820
Investments	**3b**	257	0	257	132
Charitable activities	**3c**	30,753	0	30,753	31,020
TOTAL INCOME		**32,474**	**0**	**32,474**	**32,972**
EXPENDITURE					
Charitable Activities	**4a**	27,810	34	27,844	27,134
Other	**4b**	3,471	0	3,471	3,646
TOTAL EXPENDITURE		**31,281**	**34**	**31,315**	**30,780**
NET INCOMING/ (OUTGOING) RESOURCES		**1,193**	**(34)**	**1,159**	**2,192**
Total Funds Brought Forward		84,134	7,571	91,705	87,358
Prior Year correction	**14**	0	0	0	2,155
TOTAL FUNDS CARRIED FORWARD		**85,327**	**7,537**	**92,864**	**91,705**

Movements on all reserves and all recognised gains and losses are shown above.

The notes on pages 48 to 52 form part of these financial statements.

THE BRITISH SUNDIAL SOCIETY
(CHARITABLE INCORPORATED ORGANISATION)

BALANCE SHEET
AS AT 31ST DECEMBER 2018

	Notes	Unrestricted Funds £	Restricted Funds £	31-Dec-18 Total £	31-Dec-17 Total As restated £
Fixed Assets					
Tangible assets	**2**	17,228	0	17,228	17,228
Current Assets					
Debtors	**8**	4,829	0	4,829	5,733
Cash at bank and in hand	**7**	72,644	7,537	80,181	76,052
Total Current Assets		**77,473**	**7,537**	**85,010**	**81,785**
Creditors: amounts falling due within one year	**9**	9,374	0	9,374	7,308
NET CURRENT ASSETS		68,099	7,537	75,636	74,477
NET ASSETS		**85,327**	**7,537**	**92,864**	**91,705**
Funds of the Charity					
General Funds		85,327	0	85,327	84,134
Restricted Funds	**6**	0	7,537	7,537	7,571
Total Funds		**85,327**	**7,537**	**92,864**	**91,705**

Trustees' Responsibilities

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

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

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

These accounts were approved by the Trustees of the CIO on the 23-2-19 and signed on their behalf by:

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

Signed G. Stapleton, Treasurer.

THE BRITISH SUNDIAL SOCIETY
(CHARITABLE INCORPORATED ORGANISATION)

NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31ST DECEMBER 2018

1. ACCOUNTING POLICIES

Incoming Resources

Recognition of Incoming Resources

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

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

Incoming Resources with Related Expenditure

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

Grants and Donations

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

Tax reclaims on Donations and Gifts

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

Contractual Income and Performance Related Grants

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

Gifts in Kind

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

Donated Services and Facilities

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

Volunteer Help

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

Investment Income

This is included in the accounts when receivable.

Investment Gains and Losses

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

Expenditure and Liabilities

Liability Recognition

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

NOTES TO THE FINANCIAL STATEMENTS (continued) FOR THE YEAR ENDED 31ST DECEMBER 2018

Expenditure and Liabilities (continued)

Governance Costs

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

Changes in Accounting Policies

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

Annual Commitments

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

Assets

Tangible fixed assets for use by the charity:

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

Investments

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

Basis of preparation:

The financial statements have been prepared on the historical cost basis of accounting in accordance with the Charities Act 2011 and in accordance with applicable accounting standards. The financial statements have been prepared in accordance with Accounting and Reporting by Charities: Statement of Recommended Practice - "Accounting and Reporting by Charities" (SORP 2015). The accounts have been prepared on an ongoing concern basis. The charity meets the definition of a public benefit entity under FRS102. No restatement was required in making the transition to FRS102.

2. TANGIBLE FIXED ASSETS

		Unrestricted Funds £	Restricted Funds £	Total £
Library				
Opening	31-Dec-17	17,228	0	17,228
Revaluation		0	0	0
Cost at	31-Dec-18	17,228	0	17,228
Depreciation	31-Dec-17	0	0	0
Charge		0	0	0
Depreciation at	31-Dec-18	0	0	0
Net Book Value	31-Dec-18	**17,228**	**0**	**17,228**
Net Book Value	31-Dec-17	17,228	0	17,228

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

THE BRITISH SUNDIAL SOCIETY
(CHARITABLE INCORPORATED ORGANISATION)

NOTES TO THE FINANCIAL STATEMENTS (continued)
FOR THE YEAR ENDED 31ST DECEMBER 2018

	Notes	Unrestricted Funds £	Restricted Funds £	Total 2018 £	Total 2017 £
3. INCOME					
a) Donations and legacies					
Bequests & Legacies				0	616
Donations and Gift Aid		1,464		1,464	1,204
		1,464	**0**	**1,464**	**1,820**
b) Investments					
Interest		257		257	132
		257	**0**	**257**	**132**
c) Charitable Activities					
Conference Auction		70		70	0
Day Meetings		350		350	340
Events	**5**	18,607		18,607	18,527
Sales		787		787	932
Subscriptions		10,939		10,939	11,221
		30,753	**0**	**30,753**	**31,020**
4. EXPENDITURE					
a) Charitable Activities					
Bulletin / Publications		10,663		10,663	8,480
Day Meetings		152		152	180
Education				0	246
Events	**5**	13,741		13,741	15,897
Independent Examiners Fees		675		675	614
Postal Sales		25		25	100
Professional Fees		1,959		1,959	725
Somerville Lecturer	**6**		34	34	165
Subscriptions		34		34	0
Travel		561		561	727
		27,810	**34**	**27,844**	**27,134**
b) Other					
Administration		276		276	492
Banking / Insurance		1,338		1,338	1,407
Library		208		208	208
Storage		1,649		1,649	1,539
		3,471	**0**	**3,471**	**3,646**

NOTES TO THE FINANCIAL STATEMENTS (continued) FOR THE YEAR ENDED 31ST DECEMBER 2018

5. EVENTS

	Income	Expenditure	Profit
	£	£	£
Oxford Conference (2017)	18,527	15,884	2,643
Norwich Conference (2018)	18,607	13,741	4,866

6. RESTRICTED FUNDS

	Balance 31-Dec-17	Income	Expenditure	Balance 31-Dec-18
	£	£	£	£
Andrew Somerville Memorial Fund	6,423	0	34	6,389
St Katherine Cree Restoration Fund	1,148	0	0	1,148
	7,571	**0**	**34**	**7,537**

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

7. CASH AT BANK AND IN HAND

	Unrestricted Funds	Restricted Funds	**Total 31-Dec-18**	**Total 31-Dec-17**
	£	£	**£**	**£**
Current Account	23,263		23,263	19,392
Charities Office Investment Fund	49,381	7,537	56,918	56,660
	72,644	**7,537**	**80,181**	**76,052**

8. DEBTORS AND PREPAYMENTS

	Unrestricted Funds	Restricted Funds	**Total 31-Dec-18**	**Total 31-Dec-17 As restated**
	£	£	**£**	**£**
Bath Conference (2019)	4,829		4,829	3,578
Gift Aid correction (see note 14)	0		0	2,155
	4,829	**0**	**4,829**	**5,733**

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

	Unrestricted Funds	Restricted Funds	**Total 31-Dec-18**	**Total 31-Dec-17**
	£	£	**£**	**£**
Independent Examiners Fees	674		674	614
Fee for HMRC Submission	270		270	270
Bath Conference (2019)	8,430		8,430	6,424
	9,374	**0**	**9,374**	**7,308**

10. TRUSTEES AND OTHER RELATED PARTIES

No payments were made to trustees or any persons connected with them during this financial period. No material transaction took place between the organisation and a trustee or any person connected with them.

11. RISK ASSESSMENT

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

NOTES TO THE FINANCIAL STATEMENTS (continued) FOR THE YEAR ENDED 31ST DECEMBER 2018

12. RESERVES POLICY

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

13. PUBLIC BENEFIT

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

14. PRIOR YEAR CORRECTION

A prior year adjustment of £2,155 has been made to correct last year's accounts, this is an accounting correction and due to the miscalculation by Independent Examiners Ltd of the Gift Aid reported in last year's accounts. This has been corrected in the accounts and communicated to the trustees of The British Sundial Society.

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)	chairman@sundialsoc.org.uk
Mr Chris H K Williams (Secretary)	secretary@sundialsoc.org.uk
Mr Graham Stapleton (Treasurer)	treasurer@sundialsoc.org.uk
Ms Jackie Jones (Membership Secretary)	membership@sundialsoc.org.uk
Mr Bill Visick (Webmaster)	webmaster@sundialsoc.org.uk
Mr David Brown	david@davidbrownsundials.com

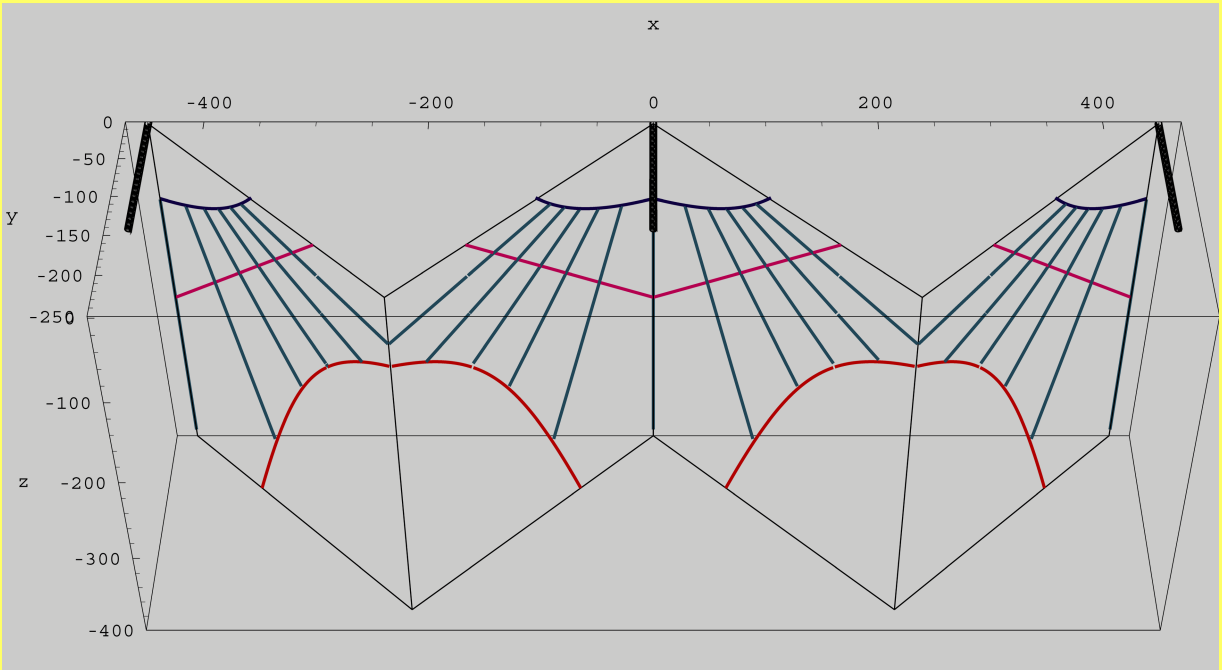
OTHER SPECIALISTS

Conference Team		conference@sundialsoc.org.uk
Biographical Projects		biographical@sundialsoc.org.uk
Editor	Dr John Davis	editor@sundialsoc.org.uk
Education	Mr Peter Ransom	education@sundialsoc.org.uk
Help and Advice	Mrs Sue Manston	HelpAndAdvice@sundialsoc.org.uk
Librarian	Mr John Wilson	librarian@sundialsoc.org.uk
Mass Dials	Mr John Wilson	MassDials@sundialsoc.org.uk
Newbury Meeting Organiser	Mr David Pawley	newbury@sundialsoc.org.uk
Newsletter Editor	Mr J Mike Shaw	newsletter@sundialsoc.org.uk
Photographic Competition	Mr David Hawker	photos@sundialsoc.org.uk
Registrar	Mr John Foad	registrar@sundialsoc.org.uk
Sales	Mrs Elspeth Hill	sales@sundialsoc.org.uk

www.sundialsoc.org.uk

Registered Charity No.: 1155688

The British Sundial Society is affiliated to the Royal Astronomical Society


x
-400
-200
0
200
400
y
0
-50
-100
-150
-200
-250
z
-100
-200
-300
-400