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EDITORIAL

For the first time since 2019, we have a *Bulletin* in which there is full coverage of a BSS Conference. Our 48 hours in York were blessed by clear blue skies albeit accompanied at times by a strong wind. There were some excellent talks including an astonishing description by Werner Riegler of a mechanical arrangement for attending to the Equation of Time based on Lord Kelvin's tide prediction machine.

Our Andrew Somerville speaker was Gloria Clifton who eloquently introduced us to numerous 17th and 18th century sundial makers, some familiar and some not so.

We had a good display of exhibits and David Hawker set up a splendid photographic display, based partly on entries for the BSS Design Awards scheme, which ran until 30 December 2020, and partly on entries for the 2020 Photographic Competition.

It was only after we returned from York that we learnt of the sad death of Tony Wood who wrote many articles for the *Bulletin* and was perhaps best noted for leading the Mass Dial Group for many years. There will be an Obituary in the September issue of the *Bulletin*.

Our lead article in this issue is by Manuel Pizarro who takes us on a European journey looking at cornice dials. There are more variants on this theme than one might expect.

Joshua Nall describes a sundial which was unearthed in Cambridge at a site just a couple of hundred yards from where I spent my College days.

Dennis Cowan is nearing the end of his extraordinary sequence of accounts of the sundials described in the 19th century by Thomas Ross. This time he writes about Ecclesiastical Dials.

There is a fascinating description of an unusual dial made by Jackie Jones. Her photograph of the dial by moonlight convincingly demonstrates that the moon really can produce shadows on a sundial.

Martin Jenkins tells us a story which spans the Atlantic and John Foad introduces us to 30 newly reported dials.

Finally, we publish the BSS Report and Accounts for the calendar year 2021. These will be noted at the AGM in Newbury on 17 September.

Frank King

A HAT FOR THE SUN

A Visual Tour of Corniced Sundials in Europe, Part 1

MANUEL PIZARRO

This article has appeared previously, in Catalan, as: Manuel Pizarro: 'Un Barret per al Sol: un recorregut visual pels rellotges de sol amb cornisa d'Europa', *La Busca de Paper*, No. 100, pp. 8-14 (Winter 2021).

Until a few years ago, sundials built with the particularity of presenting a 'hat', formed either by a flat circular surface or by a set of styles, were unknown to gnomonics enthusiasts. In the 1970s, historian of science and marine captain René R.J. Rohr[1] identified two very particular sundials in the towns of Saverne and Lorquin (eastern France) which he called "*chapeau filtrant*" (filtering hat).

In 2007, an amazing and magnificent multi-gnomon hat sundial was discovered in the former convent of the Baumette,[2] in the vicinity of the city of Angers (Maine-et-Loire, France). This discovery coincided with the publication of a series of theoretical studies by Denis Savoie on the Pingré sundial[3] and on the monumental dial of the Castillon dam[4] (Alpes-de-Haute-Provence) inaugurated in 2009. So in later years, curiosity was aroused by this type of sundial among gnomonists, with the development of the theory for its construction and functioning,[5] as well as calculation software for its hourly layout.[6]

It seems that the principle of operation of this type of sundial is older than previously believed,[7] since they are mentioned by al-Marrakushi[8] in the 13th century and Athanasius Kircher[9] in the 17th century, with examples on cylinders, spheres and cones. Even in the 18th century, the mathematician Jacques Ozanam[10] attributed this invention to Father Quenet, a Benedictine monk from the abbey of Saint-Germain-des-Prés and, years later, Joseph Mollet[11] would detail its construction in his work *Gnomonique Graphique*.

Cornice sundials are surmounted by a curved cornice (generally circular, but it can also be elliptical, parabolic, etc.) whose shadow indicates the time. According to D. Savoie, we can classify them into two families.[12]

A. Sundials with a 'hat', where we read the time with the upper part of the curved shadow of the cornice.

B. Sundials of the type made in the Castillon dam, in which we read the time using the tangent of part of the shadow of the cornice.

In some cases, the cornice may be completely absent, and the time is indicated by the shadow of the dial on itself.

The objective of this work is not to show the calculations and the formulation for its construction, but rather to

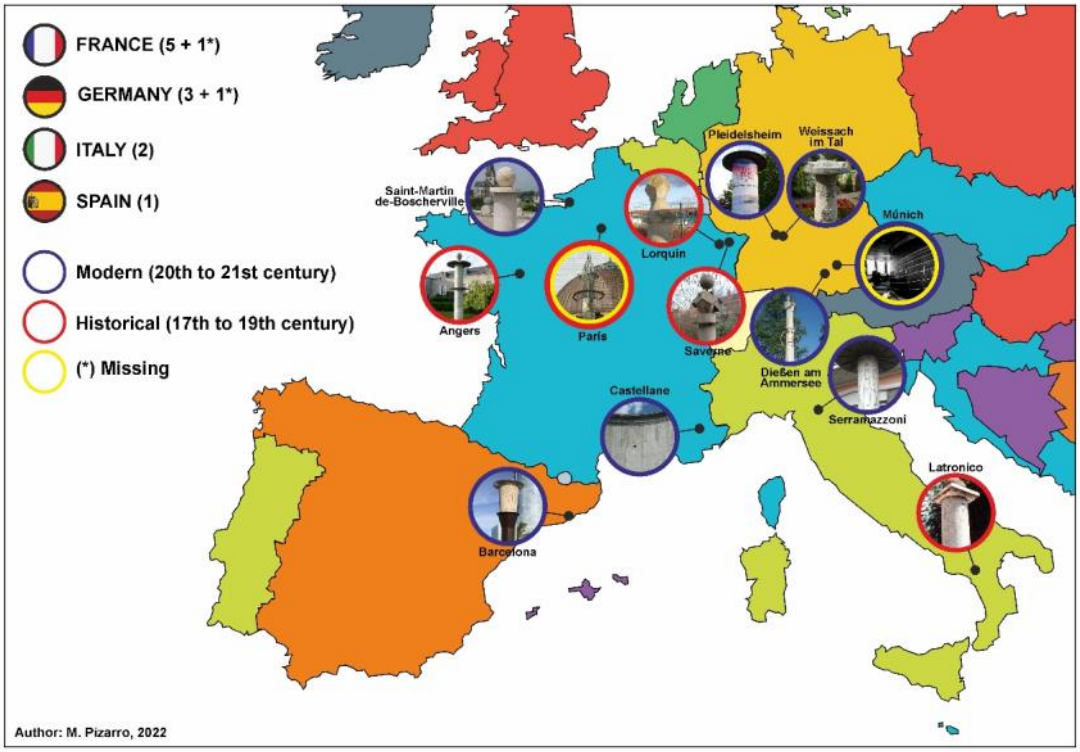

Fig. 1. Location of cornice sundials in Europe. The legend indicates the number of this type of sundial per country and the date of construction (Elaboration: Manuel Pizarro).

describe some examples compiled over the last few years of cornice sundials built in different parts of Europe. Each one has: an indication of its location (with a link to Google Maps); its address; its national inventory number (and the reference of the 'Sundial Atlas' project); a brief description of the sundial with details about its maker, date of construction, historical notes, state of conservation and some recommendations for its protection. A selection of the most important bibliographic references for each sundial and photographs of their general appearance and detail are also included.

A. HAT SUNDIALS

This sundial is usually a cylinder topped with a circular cornice or 'hat' that protrudes and projects a curved shadow that moves throughout the day, so that the time is indicated by the top of it. When the shadow is slightly curved, to achieve better time reading, in some examples the hat has been pierced with ridges or replaced by multiple gnomons, so that time reading is theoretically done when the shadow of a straight style is vertical and falls on a time line. The Pingré dial is an extreme variant of this typology.

In Europe, these sundials are rare, France being the country with the most examples, although we also find them in Italy, Germany and Spain (see Fig. 1). We present below a descriptive list of those hat sundials for which we have information.

Lorquin Gnomonic Ensemble (France; Figs 2a and b)

Location: 48° 40′ 15.4″ N, 6° 59′ 34.3″ E (*https://goo.gl/maps/nxjaxvtBDDYMNF6V8*)
Address: 1 Rue Léopold Vallet. 57790 Lorquin (Moselle, France)
Inventory: SAF 5741401; Sundial Atlas FR004925

Described by R.R.J. Rohr in 1973, it is currently (since 1969) located, although poorly oriented, at the gates of the Collège des 'Deux Sarres', although it comes from Zuffal Castle in the same town, where it was built for the Countess of Poix in 1657.

It is a gnomonic block of almost four tons, formed by a dodecahedron (55 cm high), of which ten of the twelve pentagonal faces are used as dial faces, supported by a column with a sundial with a filtering hat (1.2 metres high). Hour- and half-hour lines are engraved, as well as 19 diurnal arcs corresponding to the calendar. The zodiacal symbols are located on the noon line and the figures VII, XII and IIII appear from right to left.

Its current state of conservation is quite unfortunate; many of the gnomons of the dials of the polyhedron and of the filter hat have disappeared, and only some metal supports remain. Its cataloguing (listing), its relocation and an immediate restoration are recommended because of its antiquity and its historical value.

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Saverne Gnomonic Ensemble (France; Figs 3a and b)

Location: 48° 44′ 29.8″ N, 7° 21′ 35.8″ E (*https://goo.gl/maps/iFGVpbBExwvpp3xX7*)
Address: Chez M. Pfister, 15 Rue du Griffon. 67700 Saverne (Bas-Rhin, France)
Inventory: SAF 6743702; Sundial Atlas FR004926

This is an 18th century gnomonic ensemble, also described by Rohr, formed by a cylindrical foot (1.6 metre high and 12 cm in diameter), with a filtering hat and crowned by a

Fig. 2a. Lorquin gnomonic ensemble (France) (Photo: Guy Brélivet. http://michel.lalos.free.fr/cadrans_solaires).

Fig. 2b. Detail of the remains of the 'filtering hat' and the time and calendar lines of the Lorquin sundial (France) (Photo: Serge Gregori. Inventaires des cadrans solaires 2020. SAF-CCS).

Fig. 3a. Saverne gnomonic ensemble (France) (Photo: Guy Brélivet. http://michel.lalos.free.fr/cadrans_solaires).

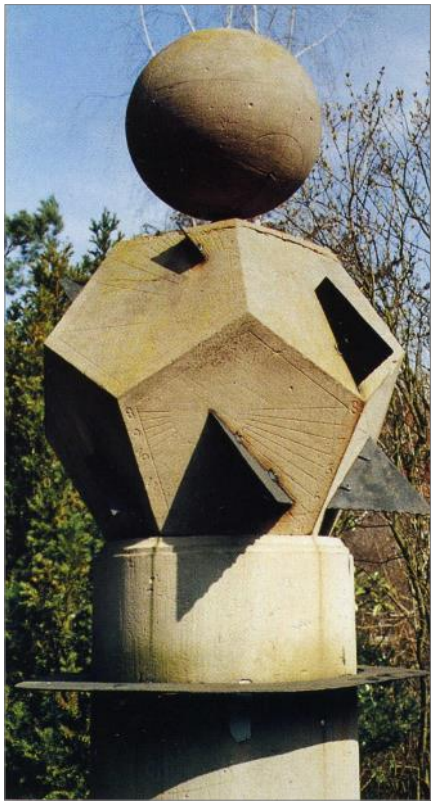

Fig. 3b. Detail of the polyhedral dial and the metal 'hat' of the Saverne sundial (France) (Photo: Serge Gregori. Inventaires des cadrans solaires 2020. SAF-CCS).

dodecahedron where ten of the twelve faces are used as sundial faces (25 cm high), on which rests a globe that also acts as a sundial. The total height of the structure is 2.10 metres. The 36 cm diameter dial keeps the hour lines visible at 7, 12 and 17 o'clock.

Coming from the old church and cloister of the Recollects (*Récollets*) of Saverne, the sundial was recovered during the Revolution and is currently located in this private home. Fairly weathered, especially in the hourglass design and metal parts, even the 'hat' appears to have initially been a filter which was later replaced by a circular metal plate. Because it is an important element of historical heritage, its cataloguing, custody and restoration by the local or regional administration is recommended.

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Fig. 4a. Gnomonic ensemble of the former 'La Baumette' convent, after the restoration of part of the column in 2013 (France) (Photo: Monique Bourgeois).

Fig. 4b. Detail of the multi-style 'hats' and hour lines of the sundial of the former convent of 'La Baumette' (France) (Photo: Yolande Stern).

Gnomonic Ensemble of the Old Convent of 'La Baumette' (France; Figs 4a and b)

Location: 47° 27′ 01.6″ N, 0° 35′ 15.1″ W (*https://goo.gl/maps/bsVdMyDoP4PUHsLU6*)
Address: Ancien Couvent de 'La Baumette', Place Albert Cheux. 49000 Angers (Maine-et-Loire, France)
Inventory: SAF 4900911; Sundial Atlas FR002908

This unusual and magnificent ensemble built by Albert Cheux in 1884 is a unique example of this type of dial in the world. It is made up of a column (more than 3 metres high) with four elements: two multi-style hat sundials on the column and two southern vertical sundials on the pedestal. As a peculiarity, it presents the time indication in true solar time and universal time for the Paris meridian with half analemmas for each time line and for two seasons (winter–spring for the upper dial and summer–autumn for the lower dial).

In the spring of 2013, the base of the column was restored with stone from the Poitiers region, and the central rod, which was completely rusty, was replaced. Neither the styles of the hat (they are cut as a single sheet of cast iron and the craft technique is complex) nor the hourly design was changed owing to the lack of specialists to carry out the restoration work.

Although it is currently listed and protected by the entities in charge of the heritage of the Loire, the restoration of the hourly design and the metallic styles that make up the 'hats' is recommended, and on the vertical sundials, replacement of some of the gnomons has also been requested.

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Gnomonic Ensemble of Saint-Martin-de-Boscherville (France; Figs 5a and b)

Location: 49° 26′ 40.1″ N, 0° 57′ 59.1″ E (*https://goo.gl/maps/1Vt7tkGdwTczoDvX6*)
Address: Jardins de l'Abbaye Saint Georges de Boscherville. 12 Rte de l'Abbaye, 76840 Saint-Martin-de-Boscherville, France (Normandie, France)
Inventory: SAF 7661402; Sundial Atlas FR004916

Based on an old engraving of the abbey and on the dial devised by Ozanam on a column, Véronique Haugel designed this gnomonic ensemble comprising a sphere and a hat sundial, and proposed its construction to the abbey, with the ATAR association being the one in charge of the project until its completion. Unfortunately, the engraving contains many errors (in the hours and the calendar) and the sundial does not work as it should. It was also finished by placing a metal cornice under the stone hat to make a correct reading of the hours.

The correction of the hourly and calendrical design is recommended, because the situation and location next to other sundials in the gardens of the monument is unbeatable for its enhancement and as a didactic and cultural element.

Pingré Sundial (France; Figs 6a and b)

Location: 48° 51′ 45.1″ N, 2° 20′ 34.8″ E (*https://goo.gl/maps/VF4Ecd6V9ueLBmrJ6)*
Address: 2 Rue de Viarmes, 75001 Paris (Île-de-France, France)
Inventory: SAF 7500110; Sundial Atlas FR004434.
Missing sundial

The most original and daring sundial of the time was installed by Alexandre Pingré on the Medicis column in Paris in the 18th century. His 'hat' was formed by multiple styles in the form of a semicircle or 'semi-hat', but owing to the discontent of the population about the difficulty of reading the time, it was decided to replace it around 1888.

Fig. 5a. Gnomonic ensemble of Saint-Martin-de-Boscherville (France) (Photo: Véronique Haugel).

Fig. 5b. Detail of the 'hat' and the network of time and calendar lines of the Saint-Martin-de-Boscherville sundial (France) (Photo: Véronique Haugel).

According to the astronomer Lalande, the sundial was located 16 metres above the ground, and was made up of 15 horizontal styles 1.4 metres long that cast their shadows on a network of time lines and the arches of the signs of the zodiac drawn on the column. The ends of the styles were joined by a curved copper plate engraved with the hour numerals, but only one of the styles indicated the correct time.

There was a rehabilitation project for the Pingré sundial led by Denis Savoie, on the occasion of the renovation of the Halles garden, consisting of smoothing the column to install the 15 straight styles and then tracing the dial (by engraving or painting) to resist the passage of weather. In addition, at the foot of the column it was planned to place a plate with indications regarding reading the time for public use. It had the scientific support of the Paris Observatory, the Institute of Celestial Mechanics and the Calculation of Ephemeris and the Solar Sundial Commission of the French Astronomical Society, but it never materialised.

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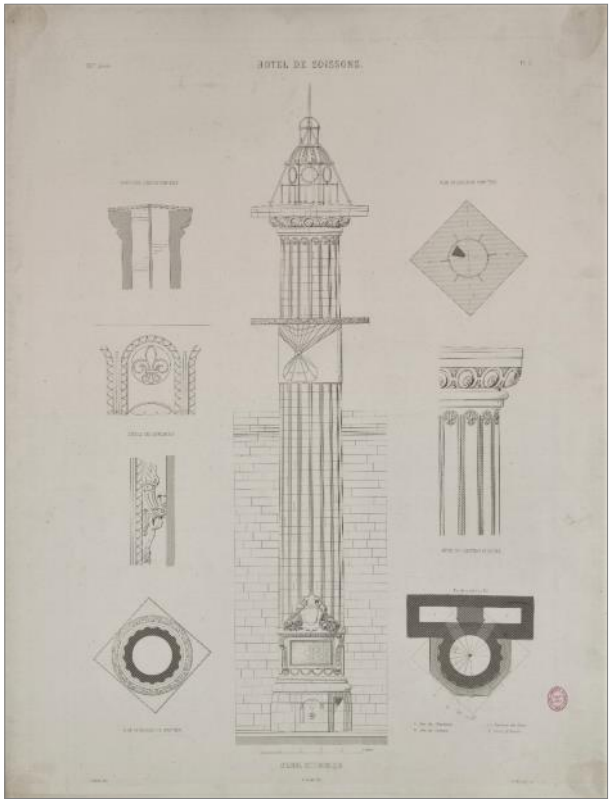

Fig. 6a. Print engraved in the 19th century entitled 'Hôtel de Soissons: Colonne Astronomique' where the hourly design of Pingré's sundial appears (Source: Emile Edmond Ollivier, Eugène Leblan & Albert Alexandre Lenoir (1867). Statistique monumentale de Paris publiée par les soins du Ministre de l'Instruction publique: Cartes, plans et dessins. Atlas, Volumes 2 à 3. Paris: Imprimerie impériale; Museo Carnavalet - Historia de París).

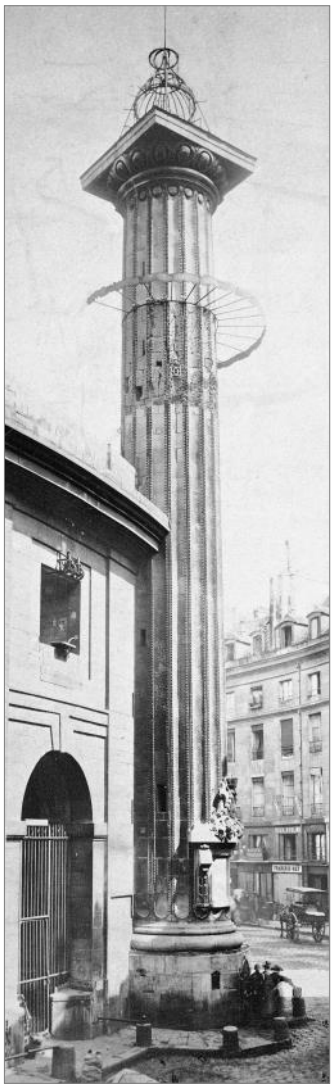

Fig. 6b. Detail of the styles of the Pingé sundial before its dismantling in a photograph from the second half of the 19th century entitled "Colonne de Médicis – de la Halle au blé – (France)" (Source: Anonymous; Musée Carnavalet).

Sundial with Cornice from Latronico (Italy; Figs 7a and b)

Location: 40° 05′ 14.8″ N, 16° 00′ 57.2″ E (*https://goo.gl/maps/kbqUqNoxo79dosYr9*)
Address: Piazzetta Federico Pezzullo Vescovo. 85043 Latronico (Basilicata, Italia)
Inventory: UAI PZ-PZ0006; Sundial Atlas IT013194

This sundial was built by the Franciscan friars in 1862 on a column that supports a crucifix, in a small square next to Via Calvario, in the upper part of the town of Latronico. Over the years, it has suffered several ruptures in the column (in 1960 and 1972) and the originally circular cornice has been replaced by a square one. Unfortunately, it does not display the time correctly, and, furthermore, in one of the restorations, the noon line was not perfectly aligned along the east–west axis on the sundial.

Two similar dials are drawn on the cylindrical surface, one with the 12 o'clock line to the east and the other in a mirror image to the west, following the design described by J. Mollet in the 19th century. In both dials, the hours are engraved from 8 in the morning to 4 in the afternoon, in addition to the solstitial curves and the equinox line. The

Fig. 7a. Detail of the square cornice (not original), the hour lines and the calendar lines of the Latronico sundial (Italy) (Photo: Lucio Saggese. Sundial Atlas: http://sundialatlas.net).

Fig. 7b. Front detail of the Latronico sundial and part of the currency inscribed on the column (Italy) (Photo: Lucio Saggese. Sundial Atlas: http://sundialatlas.net).

reading of the time, as we have mentioned, is wrong and the indications about the time of year would be shown by the shadow of the column with the shadow projected by the original circular cornice. The column is inscribed with the motto "Ora ne te rapiat hora" (pray that you do not waste your time in vain) and other engravings that are not legible.

Because of its antiquity and interest, its protection and the restoration of the column, the cornice (to its original circular shape), the time and calendar lines, as well as the inscriptions and the rest of the marks present are recommended.

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Manuel Pizarro is an admirer of sundials, a member of several associations (AARS, SCG, SAF-CCS, BSS, NASS) and, for years, has been interested in the history of scientific instruments and Arabic and Andalusian gnomonics. He can be contacted at *manolopizarro@yahoo.es*

The concluding part of this article will appear in the September 2022 issue of the *Bulletin*.

PRELIMINARY ASSESSMENT OF A POCKET SUNDIAL EXCAVATED AT ROUND CHURCH STREET, CAMBRIDGE, IN THE SUMMER OF 2019

JOSHUA NALL

In the summer of 2019, the Cambridge Archaeological Unit recovered a sundial (RCS19 <1191> [035] sf.126) from a dig site adjacent to Round Church Street, Cambridge, during excavation in preparation for the construction of a new block of student accommodation. The excavations revealed archaeological evidence for Roman period occupation and then the development of Cambridge from the tenth century onwards. The sundial was found in what would have been an open garden area associated with some houses that lay behind the Round Church. It appears to have been deposited within a soil layer in the garden.

Fig. 1. Dial RCS19 <1191> [035] sf.126 shortly after its recovery from the dig site (image © Cambridge Archaeological Unit).

Fig. 2. Details of Dial RCS19 <1191> [035] sf.126 (image © Cambridge Archaeological Unit).

The piece is a portable diptych sundial, composed of two hinged leaves made from animal bone (not ivory), both 49–51 mm in diameter (see Figs 1–3). The horizontal leaf holds a compass box (compass needle missing), with some gold leaf remaining from the compass rose. The glass cover to the compass box survives, though broken into two pieces and heavily discoloured. The brass ring that holds the glass cover in place also survives. What remains of the metalwork around the hinge suggests that the dial originally came with a retaining hook and stud to hold the leaves open at 90°. At the open end of the dial, a hook and stud for holding the dial closed survives, as does a small metal ring, perhaps for hanging the dial from a belt. The string gnomon that would be held taught between the two leaves does not survive, though both anchor points are still evident. A best effort to measure the angle between these points suggests that the dial was made to be used at or around a latitude of 48°, commensurate with northern France and southern Germany and a typical result for non-adjustable diptych dials manufactured in these countries.

The outside surfaces of the dial's leaves are blank and appear to have been polished and varnished. The chapter

Fig. 3. Dial RCS19 <1191> [035] sf.126 following conservation (image © Cambridge Archaeological Unit).

ring of the dial carries punched Roman numerals, suggesting that the piece is not a one-off as the maker had access to a suitable set of punches. The inside of the vertical leaf appears blank, though there is evidence from under the microscope that it was originally painted. A hole in the vertical leaf seats onto a small metal pin below the dial face to align the leaves on closing. One small design flourish is telling: to the north and south of the chapter ring are decorative circular arcs. These appear most typically on portable diptych dials from 17th- or early-18th-century France, in particular the dial-making centre of Dieppe.[1] However, this form of flourish is also present on at least one dial from the German centre of ivory dial-making, Nuremberg.[2]

No ivory/bone diptych dials are known to have been made in Britain, so this object is almost certainly a continental import (an assertion that is corroborated by the measured gnomon angle). The dial is unusual in being made from bone; dials from Dieppe and Nuremberg are almost always made in ivory. However, a very few bone examples do survive and presumably represent the cheaper end of the market for such devices. Taking the above into account, the object appears to be a bone diptych dial, probably French 17th century.

ACKNOWLEDGEMENTS

The sundial was recovered during excavations by the Cambridge Archaeological Unit on behalf of the landowners, Trinity College and the Cambridge Union Society, and we thank them for granting access to the object. The author would like to thank Craig Cessford, Mike Cowham, and John Davis for their contributions to this preliminary assessment.

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1. See, for example, the French diptych dial, c.1620, illustrated on p.58 of: Mike Cowham: *A Dial in your Poke*, 2nd ed., M.J. Cowham, Cambridge (2011).
2. Diptych sundial by Hans Tucher, 1597, Nuremberg, inv. WLM 2884, Landesmuseum Württemberg, Stuttgart: *https://www.landesmuseum-stuttgart.de/sammlung/sammlung-online/dk-details?dk_object_id=10070*

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Replica Roman Portable Sundial

This Roman portable sundial was made for the Chairman by Vsevolod Buravchenko. For details of the design, see Frank H. King: 'Analysis of a Roman Portable Sundial', *BSS Bulletin*, 27(iii), 22-29 (September 2015).

IN THE FOOTSTEPS OF THOMAS ROSS
Part 39: The Ecclesiastical Sundials

DENNIS COWAN

We all know that Thomas Ross and David MacGibbon collaborated to write the five-volume *The Castellated and Domestic Architecture of Scotland*[1] published between 1887 and 1892, and in volume 5 they (mainly Ross) included the sundials that they saw in the course of their travels. But did you know that they collaborated again to write *The Ecclesiastical Architecture of Scotland*,[2] a three-volume work which was published between 1896 and 1897?

In this later work which, as the title suggests, was all about churches, they mentioned some fourteen sundials, five of which were previously covered in their earlier work and therefore included in earlier articles in this series.[3,4,5] Here we will look at the other nine, the first of which is at Edrom, a hamlet in the Scottish Borders. Ross comments:

"*An aisle of some interest is attached to the church. It contains in a panel occupying the position of a niche on one of the buttresses a modern inscription giving the history of the aisle, viz.: — "Founded by Robert Blackadder, Archbishop of Glasgow, in the year 1499." The only portions of the aisle still preserved which are of any interest are the two angle buttresses* [Fig. 1]. *Both of these have had niches with canopies and corbels for supporting figures. The canopy of one is gone, but a sundial occupies its place.*"

Perhaps Ross had by now lost interest in sundials as he does not say anything about this one, other than noting that

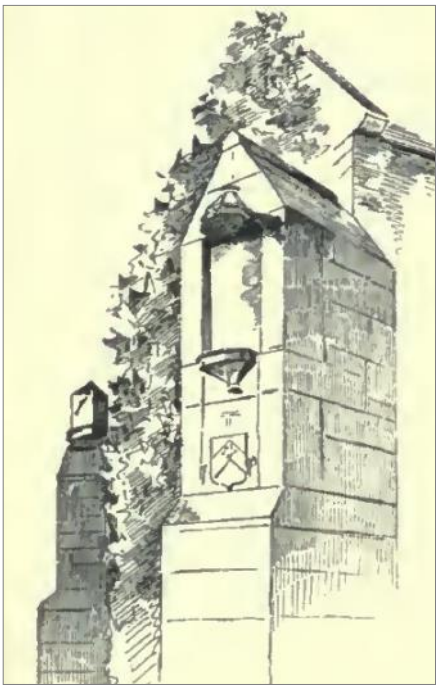

Fig. 1. The two angle buttresses at Edrom with the sundial on the left-hand one as sketched by Ross.

Fig. 2. The sundial on the left-hand buttress at Edrom today.

Fig. 3. The Edrom sundial with the bell tower behind and showing the south-east and south-west faces.

it is there, and as we will see he says very little about any of the others that are included in this latest work.

The Edrom dial is a stone cube with dials on the south-east and south-west faces and it is there today in the same position (Fig. 2). Both dial faces are very worn, but the south-east face is slightly better with the Roman numerals from 4 am to 2 pm showing (Fig. 3). No numerals or hour lines are evident on the south-west face and both faces have gnomons, but badly infected with rust.

Smailholm is a small village about six miles from Kelso in the Scottish Borders. The church there has a sundial and Ross says that:

"*Merely the shell of this building is Norman. It was greatly altered in the seventeenth century, when probably the chancel arch was cut out; and in later times it has suffered severely, so that all its original architectural details have been destroyed. There is a sundial on the south-west corner, bearing the date 1622, which date is probably the date of the alterations referred to and of the erection of the belfry.*"

Fig. 4. Ross's sketch of Smailholm church. The sundial is not visible.

Fig. 5. The sundial at Smailholm today (circled). There have been changes at this corner of the church.

Ross provides only a sketch of the church which does not appear to show the sundial (Fig. 4), although there does appear to have been a change at the corner where the sundial sits today, as can be seen at Fig. 5. As Ross says above, the sundial sits on the south-west corner, and has dials on both the south and west faces. The west facing dial is in extremely poor condition with the hour lines barely

Fig. 6. The poorly positioned lamp above the Smailholm sundial. Both faces are in very poor condition.

visible, if at all, and likewise with the numerals. The south face is faring better but only because its gnomon is in place.

Both dial faces though are badly compromised by a very poorly positioned lamp (Fig. 6). The date of 1622 that Ross mentions can no longer be seen, which is a great pity as it would have been a contender for Scotland's oldest dated sundial.

Staying in the Scottish Borders, at the church in the tiny settlement of Abbey St Bathans, Ross merely states that:

"*There is a sundial on the wall-head of the south wall at the east end.*"

He doesn't provide a sketch of the sundial, but to have a sundial at the east end of a Scottish church (Fig. 7) is extremely unusual as they are almost exclusively mounted at the south-west corner. The sundial itself, which is slightly canted to the south, is sitting on a corbel which

Fig. 7. The Abbey St Bathans sundial unusually at the east end of the church.

Fig. 8. Close-up of the Abbey St Bathans sundial. The poor condition is evident.

appears to incorporate a head. It is a stone cube with a sundial face only on the south side.

Like the previous two sundials, it is in a poor condition with hour lines visible, but no numerals or gnomon and with serious flaking (Fig. 8).

The village of Gladsmuir is in East Lothian and the old ruined church still has its sundial. Ross says that the old church of Gladsmuir is

"*a ruin near the village of Longniddry. The parish of Gladsmuir was formed out of several other parishes in 1695, at which time this church* [Fig. 9]*, now in ruins, was erected. A sundial* [Fig. 10]*, bearing the date 1700, stands in the usual place at the south-west corner.*"

The sundial is in place at the south-west corner underneath the precarious-looking bell tower (Fig. 11). It is in a poor condition. The date of 1700 can just be seen on the south dial face (Fig. 12) as well as the hour lines, but the

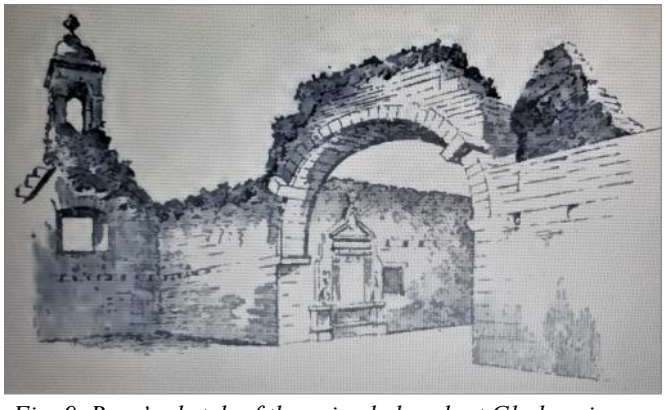

Fig. 9. Ross's sketch of the ruined church at Gladsmuir.

Fig. 10. Ross's sketch of the Gladsmuir sundial at the usual south-west corner. The notch at the top right of the west face can be seen.

Fig. 11. The Gladsmuir sundial today (circled) with the precarious-looking bell tower behind.

Fig. 12. Close-up of the Gladsmuir sundial with the intriguing notch on the west face.

numerals have all but disappeared. Part of the rusty gnomon is still in place. On the west dial face all that remains is the stub of the gnomon and the intriguing slot at the top right of the face. This slot is visible on Ross's sketch (Fig. 10), so what could its purpose have been, if anything? Perhaps it was for a wrongly positioned gnomon.

Gifford is a fine village also in East Lothian and the church at the end of the main street is known as Yester Church. It is of the 18th century and replaced an earlier church. Ross says:

"*The parish church of Yester stands at the north end of the village of Gifford, about four and a half miles south of Haddington. The ancient church of Yester has already been described. It was superseded last century by the present structure, which is a plain oblong chamber of the usual style of the period, but with a tower on the south side* [Figs 13, 14]*, which is a good example of that class of erection at the period.*"

You may notice that he did not mention the sundial which can just be seen in his sketch. It is wrapped round the south-west corner of the tower with one dial facing south-east and the other south-west. Nothing remains of either face other than the rusty gnomon on the south-east side (Fig. 15).

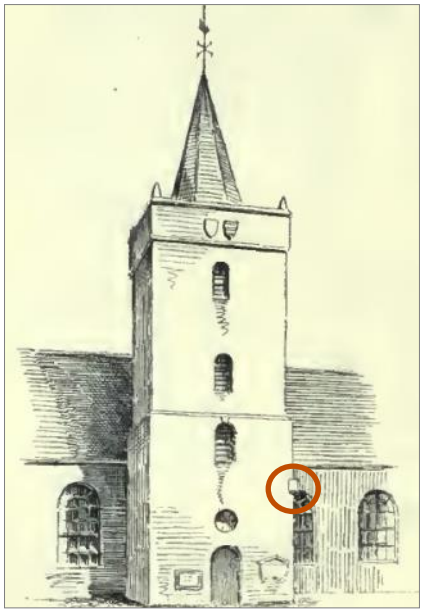

Fig. 13. Ross's sketch of Yester church at Gifford with its sundial (circled) although Ross does not mention it.

Fig. 14. Yester church today with its sundial (circled).

Fig. 15. Close-up of the very poor Yester sundial.

In the west of Scotland, Rutherglen is a town south-east of Glasgow and only three miles from its centre. Ross tells us that:

"*The church stands near the west end of the cemetery, on the north side of the main street. The entrance from the street is through a picturesque lych-gate of Renaissance design, dated 1663* [Fig. 16]. *It is surmounted by a sundial, dated 1679.*"

The lych-gate with the sundial remains in front of the church (Fig. 17) although the church itself has changed considerably. There is a blue plaque on the church wall saying that "*the Kirk Port* [the name of the lych-gate] *was built in 1663 in a Renaissance style to replace the earlier entrance at the west end of the churchyard. Building costs*

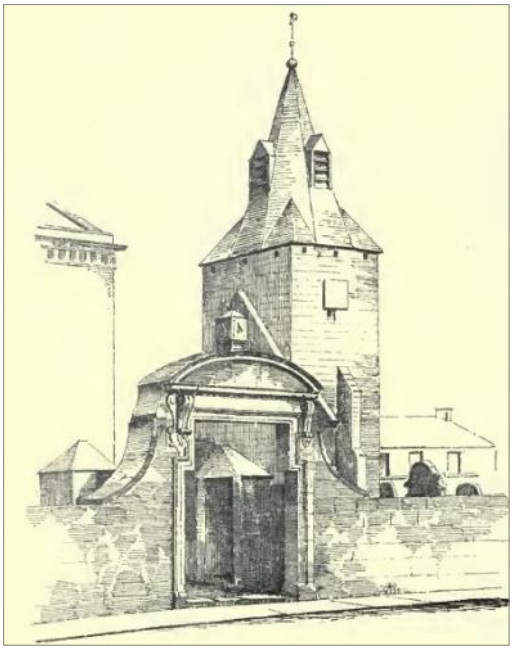

Fig. 16. The Rutherglen lych-gate with the sundial above as sketched by Ross.

Fig. 17. The Rutherglen lych-gate today with the sundial above (circled).

Fig. 18. The south and west faces of the Rutherglen sundial. The date of 1679 can be seen on the south face.

Fig. 19. The north and east faces of the Rutherglen sundial.

were part funded by fines levied for the profanation of the Sabbath. The sundial was added in 1679."

It is interesting to note how the building costs were part funded!

The sundial has four badly flaking dial faces with a pyramid cap on top (Figs 18 and 19). Many of the Arabic numerals and some of the hour lines exist. Metal gnomons are in place on the north, south and west faces, but only a stub remains on the east face. The date of 1679 can be clearly seen on the south face.

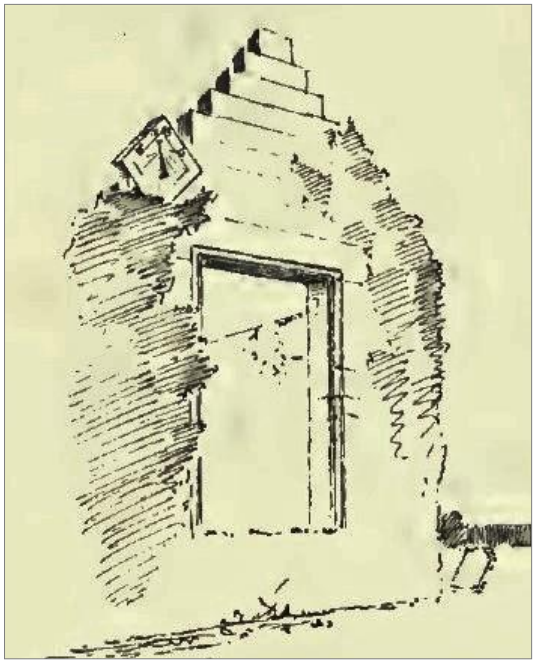

Fig. 20. Ross's sketch of the Rathen sundial.

According to Ross, the church at Rathen in the north-east of Scotland is:

"*A ruinous building situated about three miles south from Fraserburgh, and standing in an old churchyard. In the south gable* [Fig. 20]*, which is crow-stepped, there is a well-moulded window with a straight lintel, and a sundial over.*"

I have not been able to see this sundial, but the photograph (Fig. 21), which is shown with permission from Places of Worship in Scotland (POWiS), shows that it is quite unusual for a Scottish church sundial. It is square, but designed and mounted as a diamond with noon in the bottom corner and is held in place with four metal clips. The Arabic numerals and hour lines with half hour marks are clear, but it does not appear to be in the same place that it was in Ross's day. The gnomon is missing and there is a date of 16xx in the top corner above a cross, but unfortunately the last two digits are illegible.

Ross does not provide a sketch of the following sundial in Mains church near Dundee, but he mentions it in the following text:

"*This fragment of a church is situated in the centre of its churchyard, on the margin of a romantic glen, on the opposite side of which stands the ruined Castle of Mains, in*

Fig. 21. The Rathen sundial today unusually designed as a diamond. Photo courtesy of Places of Worship in Scotland (POWiS).

the region of Strath Dichty, about three miles north from Dundee. There is a sundial, of more recent date than the building, carved on the south-west corner, similar to the sundials on the porch of Linlithgow Church and on the south transept of Melrose."

It was a ruin when Ross saw it, but it no longer exists. He compares it to the sundials at Linlithgow church and Melrose Abbey. Whilst the sundial at Linlithgow[6] is a mass dial (unusual in Scotland), the one at Melrose[7] is an equal hours dial cut into the fabric of the church.

It is a great pity that Ross did not provide a sketch, as then it would have been clear which type of sundial it was.

This next sundial is at St Drostan's Church in Aberdour in Aberdeenshire. The church has been in disuse since 1818 when the present church was built, and is now a ruin. Ross briefly mentions a sundial as follows:

"*The font is still in existence. It is quite plain and octagonal, being 2 feet in diameter by about 2 feet 2 inches high. After the abandonment of the church the font appears to have been built into the wall, and to have had a sundial carved on its lower end* [Fig. 22]."

Does the fact that the sundial was carved on the lower end of the font mean that Ross sketched it when it was upside down? Also Ross states that "font appears to have been built into the wall", but the Scottish Churches website[8] tells us that "a small stone octagonal font stands on a base in the nave area". Similarly, Historic Environment Scotland[9] says that "at the intersection of the nave and the SSE aisle is an octagonal font." Neither mentions a sundial although they all say that the font is octagonal, so it is all a bit confusing.

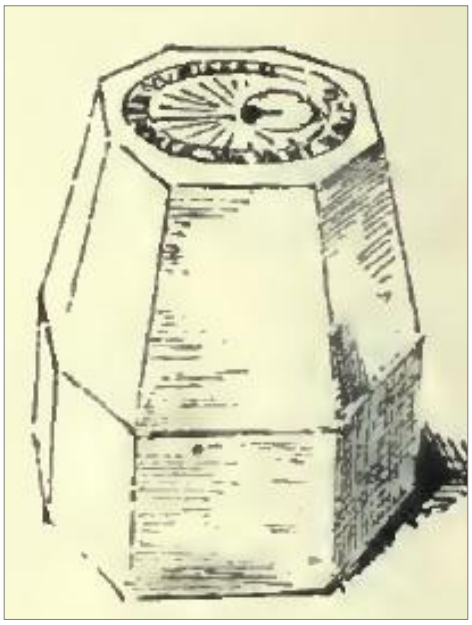

Fig. 22. Ross's sketch of the Aberdour sundial carved on the octagonal font.

Was it built into the wall upside down in Ross's day? It appears that now it may be standing on a base, so is the sundial accessible and can it been seen today, if indeed it is still there?

There were too many questions for me to commit to a round trip of some 350 miles with maybe nothing to see, so I decided to leave it for another day when I might be up in that area. Perhaps I may combine it with a trip to see the previously mentioned sundial at Rathen church.

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A SUNDIAL FROM THE SOIL

JACKIE JONES

It used to be a common practice for gardeners to 'nourish' the soil with bits of broken pottery, roof slates, clay tobacco pipes and anything else hard, to break it up and improve drainage, especially on clay soil. When working on our allotment, I frequently come across many small items and started saving some of them, especially anything that looked interesting. But what do you do with them? Make a sundial of course.

I decided to make a mosaic horizontal dial on a square paving slab using bits of slate for the main surface and clay tobacco pipe sections for the hour lines. I started with the gnomon, made from a sheet of 1.7 mm thick copper with cut-outs of beetles and apples (Fig. 1). I have used cut-outs on gnomons before as I like the way the shapes change as the sun comes from different directions. It has two pegs on the lower edge which were set into drilled holes in the paving slab, fixed with cement and left propped vertically until set.

I then worked on the hour numbers in the slate, which were ground out with a small round steel burr. I am not an expert in lettering by any means, so there were a number of rejects and some of the acceptable ones I used are slightly crooked. I painted in the recess with white exterior paint and sanded off any excess, then made the outer edge vaguely straight (Fig. 2). The hour lines were marked in pencil on the base and the individual number pieces set around the edge, with spacers where needed, and then cemented in place.

Fig. 2. Grinding out the numbers in the slate with a steel burr.

Fig. 1. Gnomon cemented into the paving slab base.

For the hour lines, I used clay tobacco pipe pieces. I have lots of them, some with intricately decorated bowls (Fig. 3). The clay pipe industry peaked following the popularity of smoking first in the 17th century and then again in the Victorian period before being replaced by wooden pipes. The rich considered them a single use item; the poor smoked them until they fell apart or the stems were blocked. The stems were often shortened to make them last longer. They come in different dimensions; I used the thicker ones, 7-8 mm, for the 3, 6, 9 and 12 hour lines, the thinner ones, 5-6 mm, for the rest. Most of them required trimming to neaten the ends and to make them fit the length

Fig. 3. Pieces of clay tobacco pipes used for the hour lines.

Fig. 4. The start of the layout; the clay pipe hour lines and slate numbers being cemented into place.

of the line; fortunately they cut easily with my jewellery saw and files. Then they were laid along the lines and cemented into place (Fig. 4).

The slate was trimmed, also with my jewellery saw and files, to fit between the pipe hour lines and cemented into

Fig. 5. The slate infill being cut and fitted between the hour lines.

Fig. 6. Finished grouted dial before installation.

Fig. 7. Dial in its final position in the garden.

Fig. 8. Dial showing the time by the full moon.

place (Fig. 5). It was then grouted to fill in the gaps and coated with an impregnating sealer to protect it from the weather (Fig. 6).

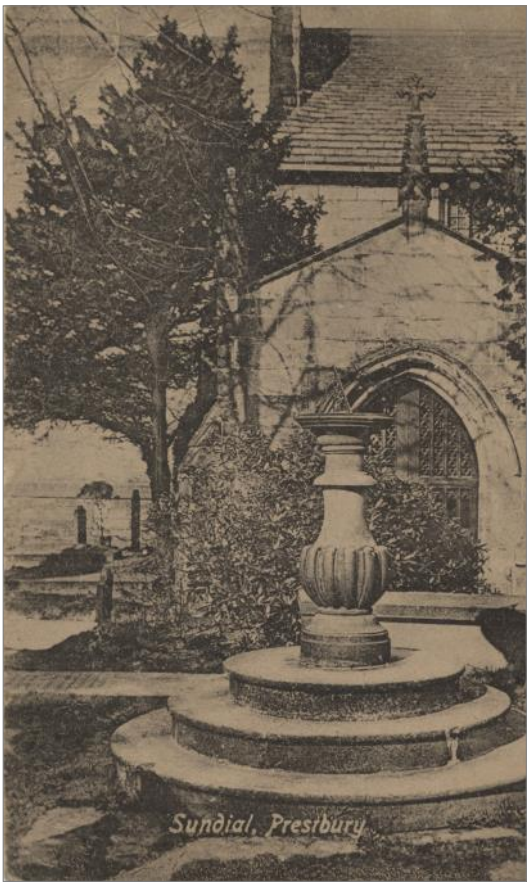
A sunny spot in the garden was found and the dial placed on an old chimney pot about 1 metre high. Being so heavy we decided it did not need any fixings (Fig. 7).

Having a sundial in our garden made it easier to use it as a moon dial, something I have never seen before. One warm night at full moon we went outside to photograph it (Fig. 8).

Jackie Jones trained as a jeweller before diverging into making silver sundials until retirement a few years ago. She has been BSS Membership Secretary since 2008. She can be contacted at *Jackie@waitrose.com*

Postcard Potpourri 59
Prestbury St Peter's Church

Peter Ransom



This is the dial in the Register with SRN 0149, so is a very early recording! The picture in the Register shows it with its gnomon, but on the St Peter's Church Wikipedia page[1] it mentions that the sundial dates from 1672, was improved in 1771 but that its gnomon is missing.

The postcard is stamped for 1923, and the publisher is printed as H.R. Jordan, Prestbury, of whom I can find nothing online. The dial itself is classed as a Listed Building Grade II.[2] The church has an interesting history, dating from 1220 and built to replace an earlier Norman Chapel that remains in the churchyard. Full details of the church can be found in the Wikipedia entry.

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1. *https://en.wikipedia.org/wiki/St_Peter%27s_Church,_Prestbury*
2. *https://historicengland.org.uk/listing/the-list/list-entry/1274911*

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Bonus York Sundial?

On the self-guided tour during the recent BSS conference at York, several members spotted a sundial in front of the Deanery but not in the list compiled by Louise Smail. On closer inspection, the reason for its omission became obvious: the elegant octagonal baluster-type pedestal supports an undistinguished 'Sunny Hours' dial (Fig. 1).

Fig. 1. The attractive pedestal (right) and the new, misaligned, dial plate (below). Photos: Ian Butson.

Fig. 2. The armillary sphere (SRN 3805) in 2001. Photo: Tony Wood.

In 2001, when the Conference was last held at York,[1] there was a five-ring armillary dial on this same pedestal (Fig. 2). Could it have been stolen, and then replaced by a 'garden centre' dial considered to be less vulnerable?

Reference

1. Walter Wells: 'Twelfth Annual Conference of the BSS, York, 27-29 April 2001, *BSS Bulletin* 13(iii), 99-102 (September 2001).

CHN

FOUR PAGES MISSING – SIR WALTER SCOTT AND A TRANSATLANTIC DIALLING MYSTERY

MARTIN JENKINS

This article is also appearing in the NASS *Compendium*, 29(2), 17-35, June 2022. This is contrary to our normal policy of not repeating articles that appear in English in other sundialling journals but is, we believe, justified by the likely interest in its contents on both sides of the Atlantic. We apologise to those who are members of both Societies for the duplication. Ed.

In March 2019, my wife Janet and I were spending a weekend at the Salford Hall Hotel in the village of Abbots Salford, not far from Stratford-upon-Avon. Incidentally, there is a sundial on the gable of the old gatehouse at the hotel. Not much is known about the sundial other than it was noted in a *Country Life* article, 'Gardens Old and New', 16th December 1911,[1] and was refurbished in the 1980s (Fig. 1).

Fig. 1. Salford Hall Hotel sundial.

On the Saturday, we decided to visit the National Trust property of Charlecote Park near Stratford-upon-Avon. In the stable courtyard of the manor was a second-hand bookshop and this is where this tale of investigation starts.

On asking the lady in charge of the book sales, "Do you have any books about sundials?" the usual response was obtained, "No, I don't believe we do". In such circumstances, my next search for sundial information always involves looking in old gardening books. Bingo, or nearly so! On sale was a 1911 copy of *The Charm of Gardens* by Dion Clayton Calthrop.[2] The list of illustrations noted a colour plate of Sir Walter Scott's sundial at Abbotsford, Scotland. Turning to the relevant page, disaster, the illustration was missing along with the accompanying pages. Four pages missing in all!

Fig. 2. Abbotsford sundial 1904 by William Smith (1848-1922) in The Charm of Gardens.[2]

Here I have to admit to never having heard of the Scott sundial but the book title etc. was duly noted, as further investigation looked to be interesting. On returning home, I made a search on the Internet which revealed a second-hand copy of *The Charm of Gardens* for sale, which was duly purchased. The anticipation mounted. Now, here occurs a small mystery in its own right. The book in the Charlecote second-hand book shop was from 1911, but the copy purchased was a 1910 edition.[3] In the 1910 copy there is no mention of the Scott sundial and no colour plate! Why the change? Subsequently, I managed to obtain a 1911 edition of the book complete with the picture of the Scott sundial (Fig. 2). No mention of the Scott sundial occurs in the text; the illustration is purely incorporated from the point of view that "*There should be a sundial in every garden to mark the true beginning and the end of the day*", page 7. The watercolour image of the Scott sundial was by William Harding Collingwood Smith (1848–1922), a well-known artist of the period. The watercolour is dated 1904 and also appears in *Abbotsford, Beautiful Britain 1912*.[4] By now my curiosity was piqued and further researches

Fig. 3. Sir Walter Scott 1822, National Portrait Gallery, London, UK.

uncovered information about Sir Walter Scott and his sundial.

The Mystery

This mystery starts at Abbotsford in Roxburghshire, Scotland. Abbotsford was the home of Sir Walter Scott (1771–1832), who was a famous poet and author (Fig. 3). Today the estate is administered by The Abbotsford Trust. Scott was born in Scotland, in Edinburgh's Old Town. His most famous book is *Ivanhoe* (1820). Apparently, Scott is one of the most successful authors of all time and is the second-most quoted writer in the Oxford English Dictionary, after William Shakespeare. Scott created the stately home and estate at Abbotsford, which was completed in 1824.[5]

In the gardens at Abbotsford is what remains of Sir Walter Scott's sundial (Fig. 4). The pedestal is complete but the horizontal sundial which adorned the top is missing. The pedestal is by the sculptor John Greenshields (1795–1835).[6] Over the decades, this sundial has been referred to in various publications, most recently and coincidentally after our return home, by Dennis Cowan in the March 2019 edition of the *BSS Bulletin*.[7] In the article, Dennis Cowan refers to the fact that a replica sundial was made for Hillside, Menands, New York, USA. In *Sun-Dials and Roses of Yesterday* (1902) by Alice Morse Earle (1851–1911), page 13 shows a replica sundial to be in existence at Hillside, Menands, NY, in the Shakespeare Garden border[8] (Fig. 5). In *Ye Sundial Booke* by G. Henslow (1914), there are two sketches by Dorothy Hartley (1893–1985). The sketch on page 246 shows the sundial pedestal at Abbotsford, Scotland, and on page 261 the replica sundial at Hillside is illustrated[9] (Figs 6 and 7). These drawings were done in 1913. More significantly, however, is the sketch by Mrs Gatty of the Scott sundial on page 251 of the 1872 edition of *The Book of Sun-Dials* [10] (Fig. 8). She made this sketch of the sundial pedestal at Abbotsford in 1839, but by then, according to Mrs Gatty, the actual sundial was missing. This point is very important to the investigation, as will be seen.

The Search Begins

This mystery intrigued me. What was the connection between Sir Walter Scott, Abbotsford, Scotland and Hillside, Menands, NY, USA? It was known that Scott moved in high circles of society including British royalty, but what was the American connection? Who commissioned the Hillside replica? Even the biography of Scott by J.G. Lockhart,[11] which is considered the definitive history on Scott, provides no clues about the sundial and its replica or any American connection. The biography does,

Fig. 4. Pedestal of Scott's sundial today, Abbotsford.

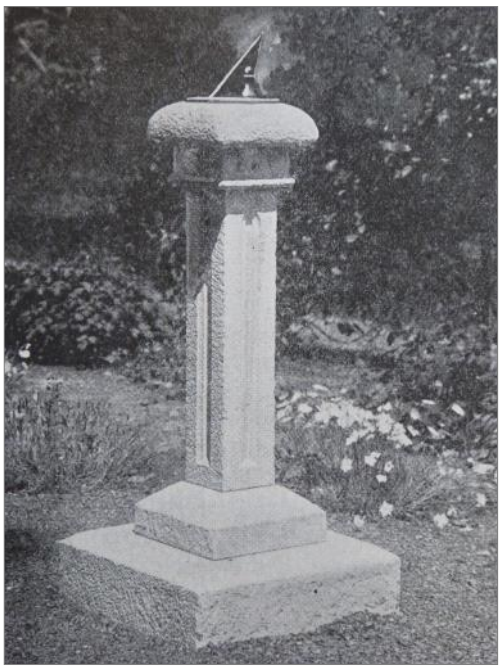

Fig. 5. Hillside replica sundial in Sun-Dials and Roses of Yesterday *by Alice Morse Earle, 1902.*[8]

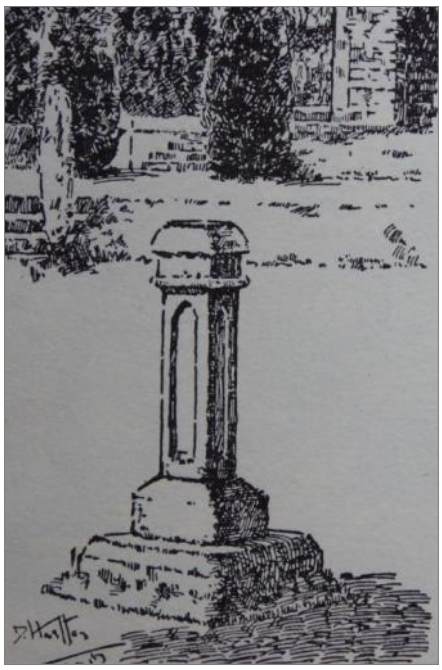

Fig. 6. Abbotsford sundial by D. Hartley, 1913 in Ye Sundial Booke.[9]

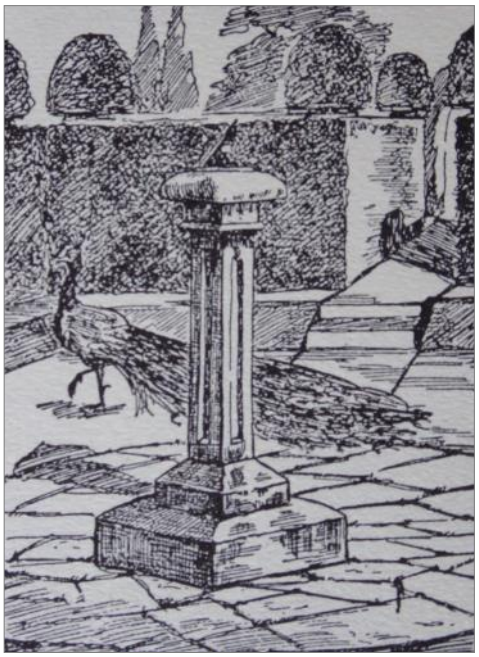

Fig. 7. Hillside sundial by D. Hartley, 1913.[9]

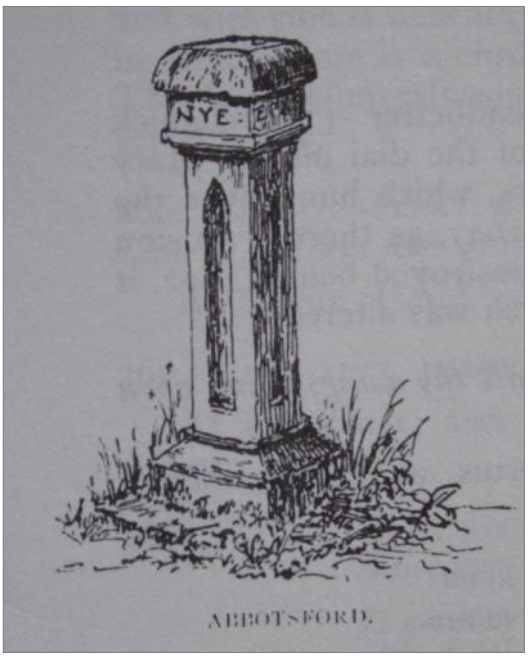

Fig. 8. Abbotsford sundial in The Book of Sun-Dials *by A. Gatty, 1872.*[10]

however, refer to the dial-stone. In July 1831, page 728, Scott is quoted as saying:

"*I must home to work while it is called day; for the night cometh when no man can work. I put that text, many a year ago, on my dial-stone; but it is often preached in vain.*"

The footnote on the page states: "this dial-stone, which used to stand in front of the old cottage, and is now in the centre of the garden, is inscribed, NYΞ ΓAP EPXΣTAI" (The Night Cometh).

In 1811, Scott purchased Cartley Hole Farm, where in 1812 he built a cottage and named it Abbotsford. This would date the sundial as around 1812. About that time there was a well-known sundial maker, John Adie and Son, at 58 Princes Street, Edinburgh. They were in operation from 1775 to 1822.[12] Given that Scott was fond of walking about Princes Street and the Princes Street Gardens during his time in Edinburgh carrying out his court judicial duties, it is not inconceivable that he purchased his dial from Adie and Son. Given the accruing wealth of Scott at this period of his life, one can assume that the sundial would have been of good quality. Similarly, I would guess that the Hillside-commissioned replica would also have been high quality, so unlikely in the following decades to have been discarded as trivial. So, what happened to the replica, or where is it?

I initially enlisted the assistance of my sister-in-law, Donna Brunig, who lives in the vicinity of Albany, NY, near to Menands, to try to obtain any information regarding Hillside. Where was Hillside, Menands and was the house still there? After several enquiries led nowhere, she enlisted the help of Mr Kevin M. Franklin, the Municipal Historian for the Town of Colonie, NY, which encompasses the Village of Menands. Kevin Franklin has written extensively about the Sage family in *The Colonie Historical Oracle*.[13] The Sage family made a fortune from the lumber business and owned a grand estate named Hillside in Menands, Albany, NY, which was one of the last great estates of the Hudson River Valley. This grand estate is no more; the house, however, still exists as a privately owned historic building. The once extensive gardens which housed the Hillside sundial have disappeared over the years and it is not possible any longer to determine where the replica sundial was located.

So far, however, our combined research efforts have uncovered some interesting facts about the Sage family and the Hillside Estate. The owner of Hillside was Mr Dean Sage (1841–1902), who was, amongst other things, a very enthusiastic fly fisherman (Fig. 9). He wrote the famous fly-fishing book *Restigouche and its Salmon Fishing* of 1888 published by David Douglas of Edinburgh.[14]

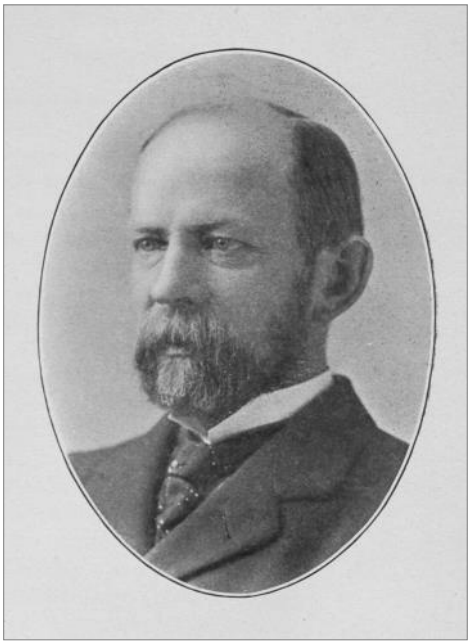

Fig. 9. Dean Sage, 1888.[14]

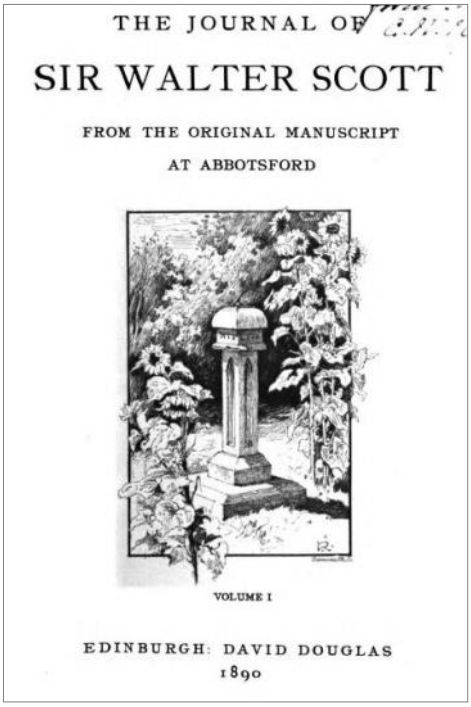

Fig. 10. Frontispiece, Abbotsford sundial by George Reid, 1890.[16]

In Alice Morse Earle's book on sundials, referring to the photograph on page 13 of the Hillside replica in 1902 (Fig. 5), she states

"*the photograph was not taken from the original dial, but from an exact reproduction of it in the garden at Hillside, Menands, New York. The original dial was sadly worn and disordered when it was drawn for Mr Douglas the publisher. He had it repaired and reset, and had this reproduction made. It is exact as to lettering as well as shape, impresses having been taken from the dial.*"

I submit that this is the same 'Douglas".

Abbotsford, the home of Sir Walter Scott, is on the banks of the River Tweed, and has been famous for salmon fishing since Roman times. The Tweed Commissioners whose responsibility was to manage the river and its fish was set up by Scott in 1805. However, Dean Sage could never have known Scott, who died in 1832 before Dean Sage was born in 1841, but it seems probable that Dean Sage visited Abbotsford at some time as part of his salmon fishing interest. The following information tends to support this theory.

In 1894 the passenger list for the German ship, *SS Lahn*, travelling from the USA to Great Britain on 17 March, lists among its passengers Dean Sage, age 54, Mrs Sarah Sage, age 48, and their daughter Elizabeth, age 21. A letter from Sarah Sage to David Douglas, dated 28th July 1896, thanks him for the 'sundial book'.[15] This would tend to suggest that the interest in sundials had been engendered on their 1894 visit to Great Britain and their meeting with the publisher David Douglas. In this same letter Sarah Sage mentions that 'they' are now in the process of sending furniture to their cottage in the Adirondack Mountains, NY,

Fig. 11. Reid sketch Vol. 1.[16]

Fig. 12. Reid sketch Vol. 2.[16]

on the shores of Hewitt Pond in preparation for living there in their old age. Unfortunately, Dean Sage suffered a fatal heart attack on 23 June 1902. He was 61 years old. The Sage cottage at Hewitt Pond has relevance later in the investigation.

Sir Walter Scott kept a daily journal from 1827 until his death in 1832. The journal consists of two volumes, Vol. 1 (1825–7) and Vol. 2 (1827–32). These journals were published in 1890 by David Douglas of Edinburgh.[16] In the frontispiece of each volume of the journals is a sketch of the Scott sundial at Abbotsford. These drawings were done by famous Scottish artist, George Reid.[17] However, there now arises another small mystery. The drawing of the sundial in the frontispiece of Vol. 1 of the 1890 publication shows the sundial in a summer season and to have a pierced gnomon (Figs 10, 11). In the frontispiece image for Vol. 2, looking very wintery, the gnomon although still pierced,

has a truncated length (Fig. 12). Given that Alice Morse Earle stated that "*The original dial was sadly worn and disordered when it was drawn for Mr Douglas*", it seems likely that George Reid drew the Vol. 2 image first and the Vol. 1 image after the dial had been '*repaired and reset*' at the behest of David Douglas. Odder still is that the text engravings in the images are in different positions relative to the orientation of the gnomon. Maybe after the dial was refurbished with a new gnomon it was incorrectly installed so that Reid's subsequent summer drawing was incorrect. In the frontispiece of Vol. 1 is the previously mentioned quote by Scott, "*I put that text, many a year ago on my dial stone*". This would tend to imply that the sundial was at Abbotsford in 1825 at the start of Scott's journals. Alice Morse Earle states that after refurbishment by Douglas the sundial was '*reset*' at Abbotsford. If so, then the Scott sundial would have been in place as late as the late 1800s when Douglas commissioned George Reid to draw it for his forthcoming print of Scott's journals.

There is another possibility, however. After Scott's death in 1832, Abbotsford suffered neglect for many years. Eventually, James Robert Hope Scott, who had married Scott's granddaughter, refurbished and added to Abbotsford between 1855 and 1857. It is recorded in *Abbotsford* by W.S. Crocket, that Hope Scott had the "*grounds and gardens completely overhauled'*.[18] Now according to Mrs Gatty, the sundial was missing in 1839 so maybe Hope Scott had a replacement made during the 'overhaul' of the gardens. In which case this would imply that the sundial '*repaired and reset*' by Douglas in the late 1800s was a 'refurbishment' of a 'replacement sundial', not the original Scott sundial which had disappeared sometime between 1832 and 1855. During Scott's time at Abbotsford, he encouraged the grounds to be used by the public primarily to enjoy the extensive grounds and woodland walks. It is entirely feasible that during the period after Scott's death, when Abbotsford had little care, that the original Scott sundial went missing.

As has been indicated previously, Dean Sage made a trip to Great Britain in 1894 when the refurbished sundial was probably back in place at Abbotsford. George Reid was born in 1841, the same year as Dean Sage, so they may have met via the common link of David Douglas, the publisher. George Reid was well known for his sketches of the River Tweed and surrounding area which would have included Abbotsford. Maybe at Douglas's request, George Reid sketched the sundial and pedestal so that Dean Sage could have a replica pedestal and sundial made, as Alice Morse Earle indicates, '*impresses having been taken from the dial*'.

The gnomons in George Reid's sketches are different from those shown in the Alice Morse Earle photograph of 1902 (Fig. 5). This photograph shows the sundial to have a rather heavy, solid gnomon. The photograph was obviously taken in the morning with the sun fairly high in the sky

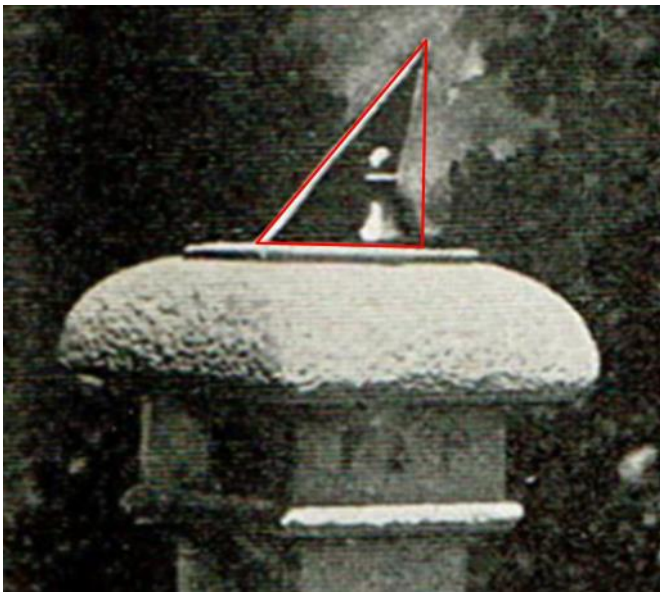

Fig. 13. Hillside sundial gnomon, uncorrected angle.

suggesting summer time. If one transposes the gnomon image, i.e., rotates it such that the gnomon would be viewed normal (i.e., face on) to the observer, the resulting gnomon angle is approximately 43°. Given that the latitude of Albany, NY is 42.7° then the resulting transposition measurements tend to indicate that the Hillside sundial was actually delineated for Albany (Fig. 13). So maybe the Hillside replica sundial was an '*exact reproduction*' as suggested by Alice Morse Earle but only in the sense of overall design. But was it '*an exact replica*' of Scott's sundial?

Why are the gnomons in Reid's drawings different from the gnomon design in Alice Morse Earle's photograph?

Possibly after 1890 the new gnomon was also damaged and replaced with a sturdier plain triangular gnomon and the dial was yet again replaced wrongly. But this was the triangular styled gnomon in place when Dean Sage visited in 1894, had it copied, and Smith painted it in 1904.

Curious Differences in the Depictions of the Dial and its Motto

The painting by William Smith (1904) shows a triangular gnomon very plain and similar to the Hillside sundial gnomon. Maybe this is a true representation of the Scott dial after the various refurbishments, in which case this would explain the gnomon design of the Hillside dial, both being in the period 1902-4. The sketch by Dorothy Hartley of the Scott sundial in 1913, however, shows no gnomon. This would suggest that the Scott sundial again disappeared sometime between 1904 and 1913. One curiosity about the sketches by Dorothy Hartley is that in the image of the Hillside sundial the gnomon is clearly of the pierced type, not the plain triangular type shown in the Alice Morse Earle photograph. One wonders whether Dorothy Hartley actually visited Hillside to make her sketch or whether she

just used artistic licence to put a gnomon on top of the Scott pillar for the illustration required for Henslow's book.

Comparing the motto locations relative to the gnomons in the various drawings, one also notices anomalies. As far as can be discerned from the various images, relative to the motto on the existing Scott sundial pillar at Abbotsford:

- The Gatty image correctly aligns the motto with that on Scott's Abbotsford pillar.
- The Vol. 2 Reid image correctly aligns the motto with that on Scott's Abbotsford pillar and the gnomon is correctly orientated.
- As far as can be determined, the Hillside sundial gnomon and pillar motto are also correctly aligned as per the Scott pillar.
- The motto as shown in Reid's Vol. 1 image puts the gnomon position out by 90° clockwise.
- The motto as shown in Smith's watercolour painting puts the gnomon position out by 90° anticlockwise.

My Conclusions

A possible link has been established between the Sir Walter Scott sundial and the replica sundial at Hillside, Menands, NY, USA. My findings and conclusions, listed in date order, are that:

- Sir Walter Scott installed a sundial at Abbotsford ca. 1812.
- Sir Walter Scott refers to his sundial in his journals of 1825−31.
- Sir Walter Scott dies in 1832.
- Mrs Gatty sketches the sundial in 1839 but she reports that the sundial was missing, only the pedestal existing.
- Dean Sage, owner of Hillside, Menands, NY, USA was born in 1841.
- Hope Scott '*overhauled the gardens and grounds*' of Abbotsford between 1855 and 1857 and possibly installed a replacement sundial.
- Between 1855 and the late 1800s the '*replacement*' sundial became '*worn and disordered*'.
- David Douglas has the Scott sundial *repaired and reset* ca. 1889.
- David Douglas puts together the journals of Scott for publication in 1890.
- The George Reid sketches were done ca. 1889 for the publication of Scott's journals. The Vol. 2 sketch was done before the sundial was repaired. The Vol. 1 sketch was done after it was *repaired and reset* but the dial was incorrectly orientated.
- Between ca. 1889 and 1894 the gnomon of the *repaired and reset* dial was yet again damaged and replaced with a new more robust triangular gnomon.
- Dean Sage, his wife Sarah, and daughter Elizabeth visit Great Britain and meet David Douglas in 1894.
- Dean Sage, via David Douglas, commissioned a replica of the 'replacement/refurbished' sundial ca. 1894. It was an '*exact copy*' but delineated for Hillside, Albany, NY.
- The Hillside sundial was a replica of a 'replacement' Scott sundial, dating from around 1855, not a replica of the original Scott sundial of 1812.
- Sarah Sage writes to David Douglas in 1896 thanking him for the 'sundial book'.
- The refurbished Scott 'replacement' sundial was probably still in place in 1900.
- Alice Morse Earle's photographs of the Hillside replica are ca. 1902.
- Dean Sage dies in June 1902 while on a fishing trip on the Restigouche River.
- The watercolour illustration of the sundial at Abbotsford by William Smith is signed as 1904. This painting was done when the dial had the triangular gnomon but was incorrectly orientated relative to the motto.
- The sketches by Dorothy Hartley are signed and dated as from 1913. No motto is indicated and the Hillside gnomon is incorrect.
- The 'replacement' Scott sundial at Abbotsford disappeared sometime between 1904 and 1913.

Finally, my thoughts are that the original Scott sundial disappeared shortly after Sir Walter's death. If the Hillside dial comes to light, I believe that it will be a copy of a twice refurbished replacement sundial. The refurbished Scott sundial at Abbotsford was probably still in place in 1904 but disappeared sometime after that. Where, when, and by whom the sundials were made, original, replacement, and replica are not known.

Ongoing Investigation

Kevin Franklin has much investigative experience. He suggested that we try to get an article about the search for the Hillside sundial into the *Hudson Valley* magazine which is widely distributed in the region of interest.[19] Kevin has visited the properties which now stand on the old Hillside estate grounds but nothing of the sundial or its pedestal have so far materialised. Extensive enquiries of local people have so far not resulted in anyone remembering a sundial on the original estate. An article about the search has now appeared in the *Hudson Valley* magazine. It will be interesting to see if anyone comes forward with information about the sundial.

There is another possible location for the 'replica sundial'. In Sarah Sage's letter to David Douglas of 1896, she mentions the move to their cottage at Hewitt Pond. Maybe because of sentimental reasons, along with other possessions from Hillside, they took the sundial as well. What was the Sage Hewitt Pond property is now home to the Hewitt Lake Club, a fitness and recreational sports centre. Because of the Covid-19 pandemic it has not to date

Fig. 14. Replica Scott sundial, Adelaide, Australia.

(March 2022) been possible to contact the operators as the centre is presently closed. In due course, however, it is hoped that someone will be able to visit the property to establish whether anything is known about the Sage sundial.

There is also the possibility that upon Sarah Sage's death the sundial passed to their daughter Elizabeth who, because of the trip to Scotland with her parents in 1894, retained affection for the sundial. If so, ongoing research will probably have to investigate the life of Elizabeth Sage (Elizabeth Manning Hare née Sage, 1878–1948) and connections with other relatives.

Another Replica Sundial

There is another sundial, which claims to be a replica of the Abbotsford Scott sundial, in Adelaide, Australia.[20] It is in the Veale Gardens and was donated by the Symon family in 1964. A date carving on the capital gives 1905 as probably the date of manufacture. Its claim to be a replica cannot be justified based on historical sketches and Alice Morse Earle's photograph; the pillar is nothing like any of the Scott sundial sketches and photo. The stone capital bears no likeness to other Scott sundial images and the sundial has a gnomon angle of 35° south (Fig. 14). Unfortunately, therefore, this sundial does not assist in finding out what the original Scott sundial looked like.

ACKNOWLEDGEMENTS

Foremost, I wish to thank Mr Kevin M. Franklin, Historian for the Town of Colonie, without whose interest and tenacity I would not have got this far with the research. I also thank my sister-in-law Donna Brunig not only for contributing to the research but also for acting as 'international' go-between. Being located in England, I could not have got this far without help from both of them, and I offer my sincere thanks. I also thank Kevin's son Dan for seeking out the ship passenger manifest information.

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sundialduo@gmail.com

NEWLY REPORTED DIALS, 2021

JOHN FOAD

With over a hundred new dial reports this year, it was hard to make this selection, so my apologies to those who sent in a good dial that does not appear here. As well as taking reports from members, I now include entries based on web sightings, where provenance and permission are given and details are adequate. Nearly a half of the entries below came from the Geograph site (*https://www.geograph.org.uk*), to whose contributors and organisers I am glad to record my thanks.

The year's new entries included five church verticals from the 17th century, three makers new to Jill Wilson's *Biographical Index of Sundial Makers*, a new instance of the use of Plane's Longitude (see dial 18), and only the second proper large-scale azimuth dial in the Register (dial 2).

1. This wonderfully located analemmatic dial is at the south end of the 20 acre Millennium Field, with views to the village church and the North Downs, and access is across a quarter of a mile of rough meadow land, so be suitably shod. It is formed from stone paving slabs set in a concrete base, showing GMT and BST hours. Alongside is a topograph with directions and distances of both local towns and villages, and also more distant overseas locations. At the north end of the field are carved and charred tree-stump statues representing the cycle of life and death. SRN 8201, Biddenden, Kent, TN27 8DD, Open.


1

J.M. Foad

2. This fine and unusual azimuth dial is on the Jurassic Way, on a small hill about 1 km to the south-east of Winwick. The gnomon is a 9-metre vertical telegraph pole, and two arcs of hour numerals are laid out in the grass, for the summer and winter solstices. The shadow of the pole indicates the time, to be read at the appropriate arc or interpolated between them. The only other good dial of this type in the Register is the Liberation dial in Guernsey (SRN 3230). Zodiac signs and an explanatory plaque were in progress at December 2021. See 'The Winwick Hall Sundial', *BSS Bulletin* 33(iii), 17-20 (September 2021). SRN 8310, Winwick Hall, Northamptonshire, NN6 7PD, Open.


2

MLE Pyrotechnics Limited, Daventry

3. The dial is a sliced sphere, with a circular chapter ring and a deeply carved face in the centre, with a beard or ruff. The 20 mm wide chapter ring has "N" at the top, and Roman numerals read from the outside, but they are now hard to distinguish. The original gnomon rod is missing. SRN 8202, Near Helmsley, North Yorkshire, Private.


3

A. Stacey-Marks

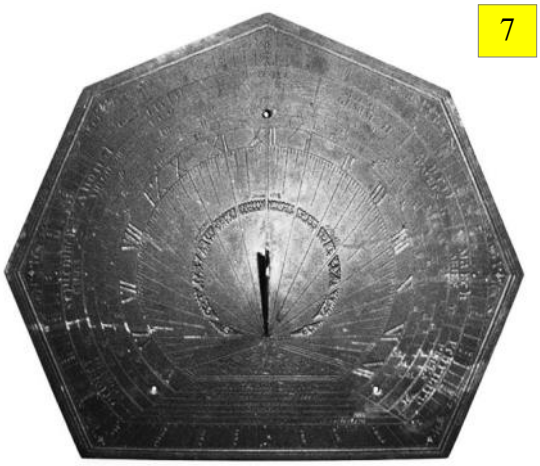
4. This four-ring armillary sphere with ball nodus is a 2017 bronze replacement for an original iron dial which had fallen into disrepair. The main section of the original limestone pedestal was retained, and with a new section grafted in and a new top and stone ball, it was erected on a new set of octagonal steps. Due to the growth of the arboretum where it originally stood, the dial was erected a


4

D. Miller

K. Allen cc-by-sa/2.0

M.J. Harley



M.J. Harley

short distance away. An information board describes the restoration. See *Bulletin* 29(ii), 32-33 (June 2017). SRN 8199, Christchurch Park, Ipswich, Suffolk, IP1 3JJ, Open.

5. The dial stands in the ornamental herb garden. It is cut into the square stepped top of a high round baluster sandstone pillar with an octagonal stepped base tapering to the circular baluster. The bronze gnomon, probably a replacement, includes a stylised Irish Harp with the silhouette of a female figure. The date "1822" is split

M.J. Harley

between the two top spandrels and "LAT 55 DG" is engraved near the root of the gnomon. SRN 8220, Glenarm Castle, Antrim, BT44 0BQ, Restricted.

6. The slate dial is engraved in the centre "Constructed / for / The Revd John Pratt / Enniskean / Lat 51° 44′ / Lon 8° 56′ ", and in a cartouche "by D. O'Connell Augt 1843". The gnomon is missing. The chapter ring is marked from 5 am to 7 pm in Roman numerals, read from the inside, with no noon gap. There are time rings outside the chapter ring showing hours and 30, 15 and 5 minutes. There is an Equation of Time table around the outside edge of the dial, and a 16-point compass rose at the south. SRN 8287, Cork, Private.

7. This slate dial is in the shape of an octagon with one point removed to give a seven-sided shape, and is inscribed "Cut by Robert Wilson September 9th 1863". There are four time rings, firstly "Apparent Solar Time for Lat 54° 55′ N Long 7° 36′ W", with the hours in Roman numerals. This is followed by three rings for London, Edinburgh and Dublin time, all in Arabic numerals. Next are two rings for the zodiac names and signs, and outside these is a 32-point compass rose labelled N, NbE etc, each point being further subdivided into four. SRN 8272, Donegal County Museum, Letterkenny, F92 K123, Restricted.

8. This impressive monument is 10 metres high and 1 metre square at the base, and is surrounded by sixteen one-metre diameter limestone blocks, each showing an hour of the day from 6 am to 10 pm in Roman numerals (VI to XXII). The south face of the obelisk has a motto in Latin ("Ad Sidera"), Gaelige ("I dTreo na Speartha") and English ("To the Stars"). The north face carries the latitude and longitude, and the west and east faces have the year in Arabic and Roman numerals. It is clear, however, that the whole is not designed to indicate the time with any precision. SRN 8286, Kerry Lane, Bruhenny, Cork, Open.

M.J. Harley

D.M. Brown

P. Nicholson

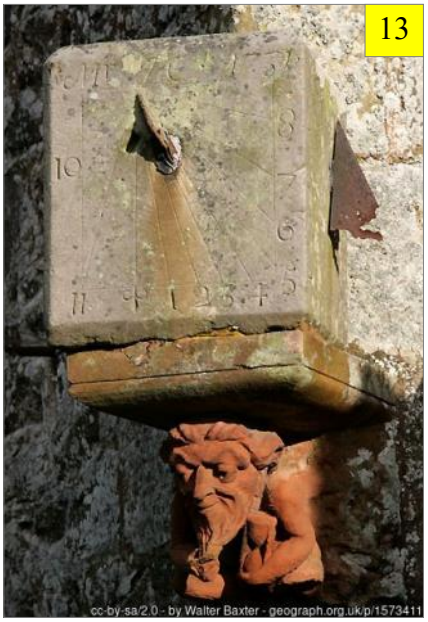
9. The dial is the final station on the 'Cosmic Walk'. The world is represented by the ringed globe at the base of the 3.2 metre high gnomon. This has a centre slit, and a prism in the tip, allowing a shaft of sunlight, adorned with a spectrum, to appear on the dial face at solar noon. There are hour lines from 6 am to 6 pm, and half hour lines, the hours being marked with 200 mm high stainless steel Roman numerals. There is an Equation of Time plaque and a Time Correction plaque with instructions on how to convert sundial time to watch time set in the tiles at the base of the gnomon. SRN 8290, Nano Nagle Centre, Ballygriffin, Cork, Private.

10. This large inclining dial slopes upward to the north, and is surrounded by a contoured stone wall with drainage holes at the bottom rim. The dial face is of Portland stone and the chapter ring is Cumbrian green slate; the sun disc is red Indian granite and the hour lines are Welsh blue-black slate. The gnomon carries a disc nodus, and declination curves for the equinoxes and solstices are cut into the stone. SRN 8204, Eureka Park, Swadlingcote, Derbyshire, DE11 0BA, Open.

11. The dial is on the Thames riverside 100 yards downstream from City Hall, mounted on a circular black limestone plinth. It was designed by Piers Nicholson, using a stainless steel Spot-On gnomon to give a line of sunlight at noon. SRN 8198, The Queen's Walk, Southwark, London SE1 2AA, Open.

12. This sundial (The Daring Vessel) is a monument to seafaring and navigation in prehistoric times, and is a tribute to Amergin and the seafarers from Northern Spain who brought the Gaelic language to Ireland. It is in the form of a large beach-like semicircle. The repoussé bronze gnomon takes the form of the emerging prow of a boat breaking upwards through the Atlantic waves. It is delineated to show Greenwich solar time, Waterville being

H.C. Lonze



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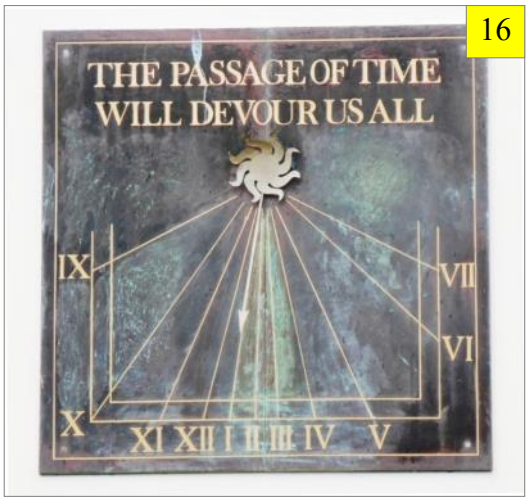
C. Brierly cc-by-sa/2.0

I. Lees cc-by-sa/2.0



D. Smith

B. Longbottom cc-by-sa/2.0

10 degrees (40 minutes) west of Greenwich. SRN 8230, Árthách Dana, Waterville, County Kerry, Open.

13. This three-faced cube dial is on the south-west corner of the church, supported by a grotesque figure carved in red sandstone, holding an hour-glass and a sundial. The central face carries the inscription "Mr JC 1731". The left-hand face is partly missing, and the two remaining gnomons are replacements but are only just surviving. SRN 8223, Parish Church, Cranshaws, Borders Region, Scotland, TD11 3SJ, Open.

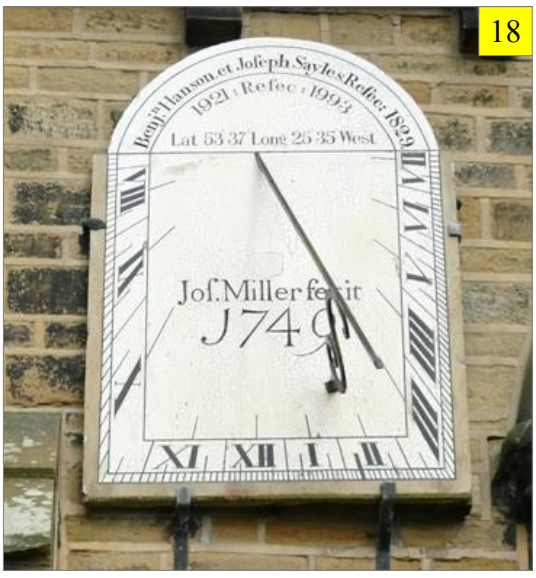
14. The spherical dial stands on a twisted stone column. It has Roman numerals, and the time is indicated by the terminator of the shadow on the sphere. A long arrow pierces the sphere, but it probably does not act as a gnomon. More information and better photographs are requested. [SRN 5682 at Hartland Abbey in Devon has similarities but indicates the time directly by the shadow of its gnomon.] SRN 8251, York Gate Garden, Adel, West Yorkshire, LS16 8DW, Restricted.

15. The dial is embedded in the stone wall of the building. Across the top is "TAK' TENT O' TIME / ERE TIME BE TINT". The hour numerals are upright Arabic, 7 am to 6 pm, with whole hours only. All furniture is cut in relief. SRN 8249, Lucy Sanderson Sheltered Housing, Galashiels, Borders Region, TD1 3EG, Visible.

16. This bronze vertical dial is attractive but puzzling. The hour numerals are IX - XII - IV - VII, but the vertical (the local noon line) is at about 2:20 pm, so that the dial appears to show the time at about 35° east, say around Beirut or perhaps Moscow. Furthermore, the dial faces about 10° west of south, whereas the gnomon is offset to the west and is more appropriate for a dial facing 10° east of south. More information would be appreciated. SRN 8202, Baring Crescent, Exeter, Devon, EX1 2NB, Visible.

17. The dial, which is in remarkably good condition for its age, is inset in the stone wall of the house. It bears across the top the inscription "R 1693 F", with the R, the F and the 1 of 1693 all ornamented, suggesting a reference to the maker or owner "RIF". The sides and the base are decorated with scroll work, and inside the base is the motto "TEMPUS LABITUR" (Time glides away). There is a circular hole in the dial plate below the gnomon and above the XI and XII numerals, but the purpose is not clear. SRN 8252, 407 Highfield Road, Shipley, West Yorkshire, BD10 8RX, Visible.

18. This much-restored dial of 1749 is inscribed "Lat 53 37 Long 25 35 West". The surprising-looking "Long" figure is what is known as the 'Plane's Longitude', the longitude where it is noon when the gnomon casts a shadow along the



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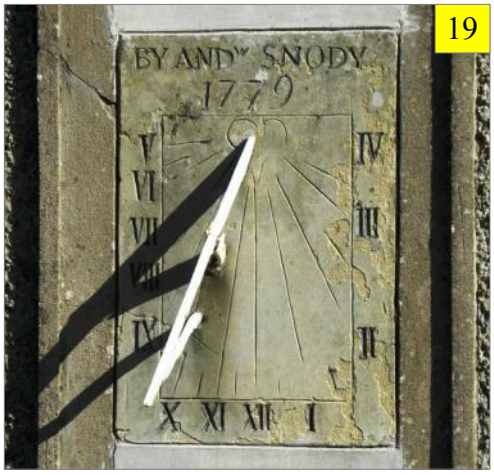

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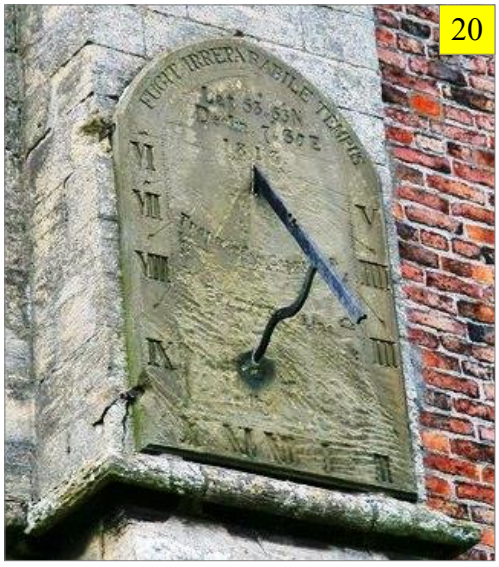


D. Rogers cc-by-sa/2.0

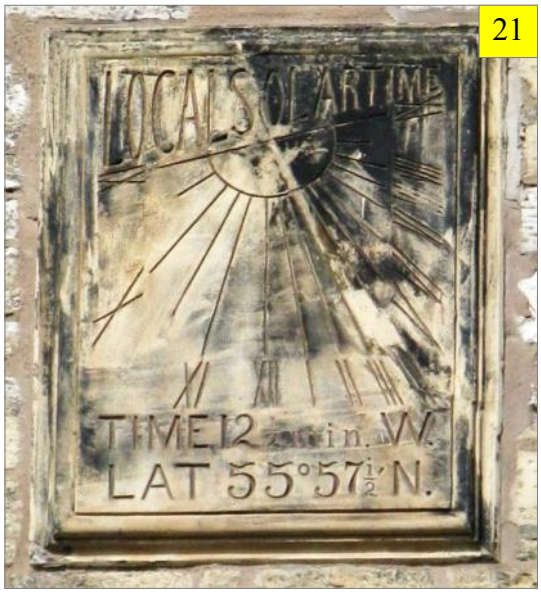
sub-style. The only other dial in the Register to use this measure is SRN 1134, at Hawkshead in Cumbria. The delineation is for about 22° west of south and the dial is canted out from the church wall which faces about 15° west of south, suggesting that the dial may have originated elsewhere, but its history is not known. The maker, Joseph Miller, is new to the *Biographical Index*. See 'Strange Longitude Revisited', *BSS Bulletin* 34(i), 32-33 (March 2022). SRN 8307, St Mark's Church, Longwood, West Yorkshire, HD3 4SZ, Open.

19. This 18th century vertical is inscribed "BY AND^W SNODY / 1779", another maker not previously known to the *Biographical Index*. A heart shape is scribed around the root of the gnomon. SRN 8262, Cairncastle Church, Co. Antrim, N. Ireland, Open.

20. The dial is at the corner of the south wall of the tower. Around the arched head is "FUGIT IRREPARABILE TEMPUS" (Time passes, never to be retrieved), followed by the latitude (53° 53′ N), the declination of the dial (7° 30′ E) and the date (1813). The iron bar gnomon has a double notch nodus in its upper edge and although the body of the dial plate is eroded one can still see the upper arc of the Winter Solstice engraved "Tropic of Capricorn" and the Equinox line, probably engraved as such. SRN 8241, Sigglesthorne Church, East Riding, HU11 5QF, Open.

21. The dial is high on the south-west face of the building, in the gable above the second-floor windows. Across the top is "LOCAL SOLAR TIME" in diminishing text, and across the base is inscribed "TIME 12 min W. / LAT 55° 57½′ N.", identifying minutes to add to obtain GMT, rather than the conventional longitude. The 12 minutes represents the location of the dial 3 degrees west of Greenwich, with a difference of four minutes per degree. The dial is similar to SRN 7711 at Peebles, some 30 km south, and may be by the same hand. SRN 8305, 36 Portobello High Street, Edinburgh, EH15 1DA, Visible.

22. This is a version of Pearson Page's early 20th century model 4206, with the motto "Vigila Oraque" (Watch and Pray) across the top and here made with the (false) date 1679 below the gnomon root. It is mounted above first



M.J. Richardson cc-by-sa/2.0

J.W. Bednar

J.M. Shaw

B. Longbottom cc-by-sa/2.0

floor level on a chimney breast facing about 8° east of south, easily visible from the street, in a large white stone frame, deeply carved with a lion's head above and a floral spray below. The sub-style is at about 10:40 am, suggesting that the dial is actually designed for a declination of about 12° east, so it was not made for this location. SRN 8301, West 1st Street, Hancock Park, Los Angeles, USA, Visible.

23. This attractive circular blue dial stands proud of the stone lining of a blind archway in the south wall of the museum, to avoid shading by the surrounding arch. It was designed and made by Professor Alan Smith, former BSS member, who was Keeper of Ceramics and Applied Art. Although it is mounted well away from the wall, and could easily be canted, it is delineated for a very small declination to the west of south, with the substyle lying at about 12:15 pm. It has solstice and equinox curves, with a small nodus spike on the gnomon. Across the gnomon root is "M S/ 20 04", the initials being in memory of Martin Suggett who was Head Curator of the Earth & Physical Sciences Department. The broad outer band is based on the Anglo-Saxon Kingston Brooch, held in the museum, and in this band at the base appears the motto: "for every man his hour". SRN 8303, World Museum, William Brown Street, Liverpool, Visible.

24. This once-fine dial is sadly in need of restoration. It was seen on the church porch in 1879 by Mrs Gatty with the motto "DISCE MORI MONDO" (Learn to die to the world) and this is still just readable at the top. Below that is a semicircle of names, probably cities aligned with the times of their noons, but not now legible. In the centre of the dial plate is a grid of curved declination lines (probably marked with their zodiac signs but they are difficult to read) and vertical azimuth lines marked with the direction of the sun (S S East etc, but again hard to read). The top line is marked "Sunrise" at the left and "Sun set" at the right. The sturdy iron gnomon has a notch nodus. SRN 8253, Batley Church, West Yorkshire, Open.

25. The square dial plate, with a chamfered egg-and-dart edging, is sunk in the stone wall of the church. This is one of the earliest dials in our selection, and shows its age, with the date 1699 across the top. The hour numerals are Arabic, but no hour lines or any other furniture remain. The gnomon remains but is rusted and the tip is missing. SRN 8229, Durisdeer Church, Dumfries & Galloway, DG3 5BJ, Open.

26. This is another 17th century dial, but in better condition following restoration. It is inset in a deep granite frame in the south wall of the church. The inscriptions are hard to make out but the date at the top is 1642 and the motto

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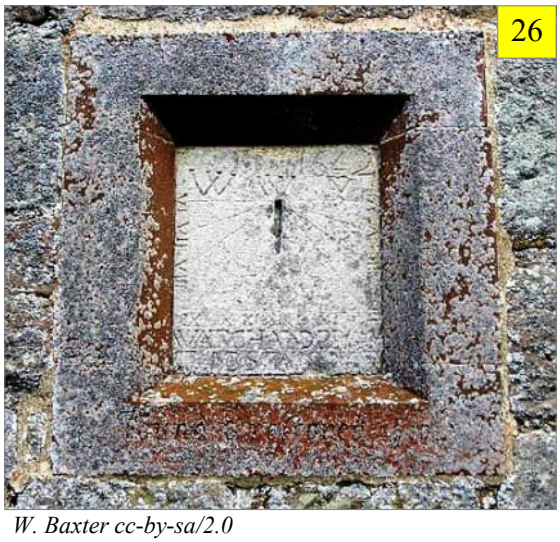


W. Baxter cc-by-sa/2.0

A. Murray-Rust cc-by-sa/2.0

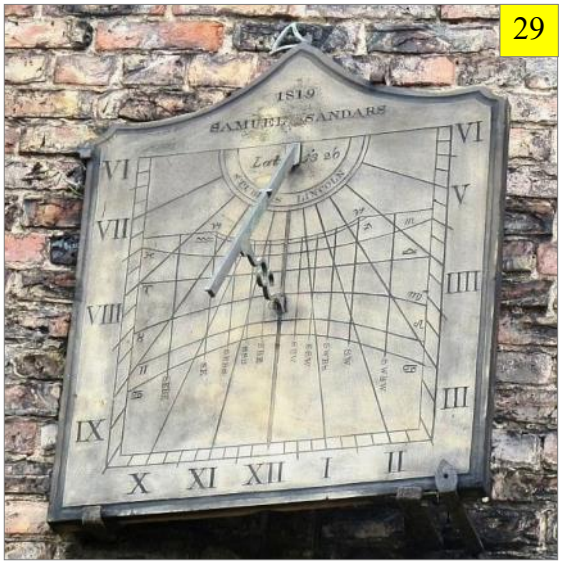
M. Freeman

across the bottom is "WATCH AND PRAY / TIME STAYS NOT". Below the date there are two letters "W" and possibly an "M". On the stone surround is inscribed: "Found & restored 1916". SRN 8246, Lilliesleaf Kirk, Borders Region, TD6 9JD, Open.

27. The date 1643 across the top of this dial is clearly and deeply inscribed. Hour numerals are VI - XII - IIII - VI, with hour lines to a semicircle around the gnomon root, and short half-hour lines. SRN 8258, Cotham Church, Nottinghamshire, NG23 5JS, Open.

28. This red sandstone dial is mounted in a natural-coloured stone frame inset into the grey stone wall at the apex of the south porch. The date 1757 is across the gnomon, and there was possibly some small inscription below that, commencing "D . . .". In the lower section is the motto which is somewhat eroded but was probably "Festinat Suprema", translated by Gatty (on another dial) as "The last (hour) hastens on". SRN 8209, St Michael's Church, Loughor, West Glamorgan, SA4 6TR, Open.

29. The dial is mounted on the rear brick wall of the house at first floor level, strongly canted out on the right, on iron hooks, to face south. In the peaked top of the dial plate is the date 1819 and the name "SAMUEL SANDARS",



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D.A. Bateman

the original owner. In a semicircle around the gnomon root is "Lat 53° 20′ ", and in the perimeter "STUBBINS LINCOLN", a third maker new to the *Biographical Index*. Upright hour numerals are used, VI - XII - IIII - VI, divided to half and quarter hours with a gnomon gap. Seven declination lines are shown, labelled with the zodiac symbols, and there are ten sun azimuth lines labelled from SEBE to SWBW. The bar gnomon is of grey or painted metal with a double hook support and a horizontal double point nodus. SRN 8308, 2 Lea Road, Gainsborough, Lincolnshire, DN21 1LW, Private.

30. The dial is a rectangular slab of stone or plaster inset high on a brick wall, which is topped with a quadruple brick chimney stack, facing a few degrees south of west. It was originally painted, and a white sun with long thin rippled rays remains, but there are now no hour lines or numerals to be seen. The thin iron rod gnomon has three short support struts. SRN 8294, Priory Hotel, Bury St Edmunds, Suffolk, IP32 6EH, Restricted.

registrar@sundialsoc.co.uk

BSS ANNUAL CONFERENCE

York, 22–24 April 2022

Following a two-year gap due to the Covid pandemic, the BSS Annual Conference was held once more, with 34 attending (sadly, two others who had booked were unable to come at the last minute). As originally arranged for April 2020, the venue was Hilton York, a centrally-placed 4-star hotel within walking distance of several sundials, and opposite the rather striking Clifford's Tower.

The organiser, Doug Bateman, had put together an excellent and varied collection of talks, several of them by speakers not regularly heard at BSS conferences.

Friday 22 April

As usual, the conference began with tea and catch up with old friends and time to study the attractive programme. After an evening buffet in the spacious hotel restaurant (which boasted an excellent view of Clifford's Tower opposite), the conference proper began.

After the group photo had been taken, Chairman Frank King welcomed everyone, and expressed grateful thanks to Doug Bateman for organising the conference, as well as to Louise Smail for her self-guided tour, Kevin Karney for attending to the audio-visual equipment, David Hawker for assembling the display of photographs, and Elspeth Hill for managing Sales.

Doug, our Master of Ceremonies, then introduced the first speaker…

Louise Smail: *A Short Preview of the Saturday Self-Guided Tour*

For the self-guided tour the next day, Louise provided some notes and a map showing the location of sundials in York, many of them stained glass, and supplemented this with an illustrated talk and advice about access to some of the dials.

Closest to the hotel is the Grade I listed Merchant Adventurers' Hall, one of the finest guildhalls in the world; in the chapel there is a stained glass sundial of 1998 depicting a young man holding a cross staff. This was worked by the York Glaziers' Trust and designed by Chris Daniel. Further north, another Grade I listed building recommended by Louise was Holy Trinity Church, Goodramgate, which contains some interesting 15th century glass.

Next on the itinerary was the Treasurer's House, from which worked the amateur astronomer John Goodricke, the subject of a later conference talk. The nearby Minster has a sundial above the South Transept door (and a mass dial hidden behind the stonemasons' working site); to the east, on College Green, a newly restored Grade II listed multiple sundial

Fig. 1. Stained glass sundial in the Merchant Adventurers' Hall, SRN 4119.

of around 1730 is to be seen. In the same general area, the historic Gray's Court, now a hotel, has a stained-glass dial in an alcove.

A short walk from this group leads to York Art Gallery, which houses a third stained glass sundial. It is by Henry Gyles, and was formerly found "in a light box on the wall", but now appears to be in store. Finally, a little further out towards the northwest, but on a bus route, the library at St Peter's School has a vertical dial above a Gothic doorway.

To conclude, Louise exhorted everyone to enjoy themselves.

Photographic display by David Hawker.

Photo: Doug Bateman

Kevin Karney: *Displaying the Equation Table on a Sundial*

The Equation of Time noticeably changes as the years go by and the purpose of this talk was to review the best way to illustrate the EoT on a dial that was expected to last for a long time.

Kevin Karney revisited how, astronomically, the EoT is generated by the Earth having an elliptical orbit and by the ecliptic longitude of the true sun not being in step with the hour angle of the mean sun on the equator (Fig. 2).

Next there was a review of the many ways in which the EoT can be displayed on (or near) a dial – whether by graph, table or figuratively.

In order to investigate this problem, a search revealed that the best way to find the EoT was to use NASA/JPL Horizons system, which is easy and free to use. Horizons is the system that allows space trajectories to be computed – so can be

expected to employ the best possible astronomical algorithms. Of the many, many possible output capabilities from the Horizons system, one can choose to display the local hour angle of the sun. From this, it is a simple step to deduce the EoT. Hence the investigation generated an array of EoT every 6 hours over a century – 146,100 values. These values were used to perform Fourier Analysis on 100 leap year cycles, each of 1461 days. From these a new single

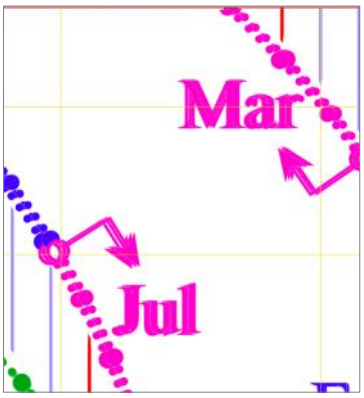


Fig. 3. The unsatisfactory EoT line blurring for an EoT that covers a life of some 50 years.

algorithm – spreadsheet compatible – was generated for the Century.

Having obtained a reliable set of data, it was concluded that, for short-lived dials, a 'Victorian' table (on which the EoT is only displayed for the dates on which it changes), or the Intrinsic 'Flame' graph, provided the best options. For long lived sundials, a graph would be preferred with the lines blurred to cover the EoT changes – a most unsatisfactory result… (Fig. 3).

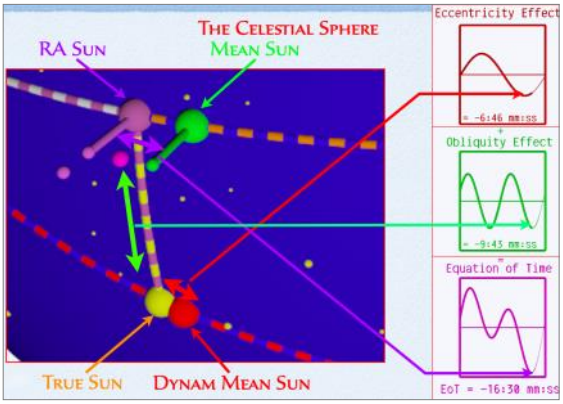


Fig. 2. The positions of the true sun with respect to the mean dynamical, the equatorial sun, and the mean sun on 3 November when the EoT is greatest

Saturday 23 April

Frank King: *The San Petronio Meridiana: Counting the Scales*

The Basilica of San Petronio in Bologna is home to the longest indoor meridian line in the world. The noted 17th century

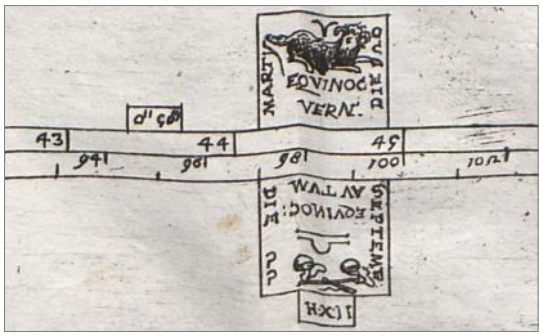


Fig. 4. Cassini's engraving in the vicinity of the equinoxes. The lower central scale shows the distance along the line from the starting point in 1/100th parts of the height of the hole in the roof above the floor. At 100 units on the lower scale, the upper scale tells us that the sun's Zenith Distance is 45°. The label in the upper outer scale shows 0'' 50'''; this is 50 arc-thirds from the start of the line. The label in the lower outer scale shows H.XII, indicating that the time of sunrise is 12 Common Italian Hours.

astronomer Giovanni Cassini laid out this line in 1655 and it was laid out afresh and modified in 1776 by Eustachio Zanotti. It should be a simple matter to establish how many scales there are on this line, but Frank demonstrated that serious writers have different views as to what constitutes a scale, and Zanotti dispensed with three of Cassini's scales and added a new one of his own.

Fortunately, Cassini's documentation survives and this includes a gate-fold engraving of his drawing of the entire run of the line. Frank showed several details of this engraving (Fig. 4 is one example) and also showed his own fair copy of the engraving. He described how he used Cassini's tables of Refraction and Parallax as well as Cassini's estimates of the latitude of Bologna and the obliquity of the ecliptic in 1655. A particularly unusual scale showed distances along the line in arc-thirds, 1/3600th of an arc-minute on the Earth's surface or 1/3600th of a nominal nautical mile.

Cassini's line showed the time of sunrise in Common Italian Hours, this also being the length of the night in hours. This was one of the scales that Zanotti dispensed with, but he introduced an unusual scale of his own. This showed the time of midday! One might imagine that this was always 12:00 apparent solar time but Zanotti's new scale shows the time of midday in Belltower Italian Hours where each day begins half an hour after geometric sunset. At an equinox, the time of midday is 17½ Belltower Italian Hours.

John Webster: *A DIY Spherical Sundial*

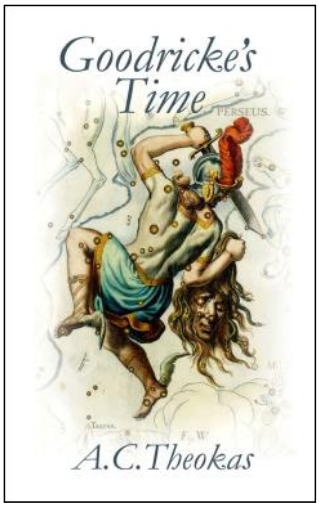
To start his presentation John said he was going to tell us an illustrated story: a story which began with a book and, after fifty years of frustration, failure and fun, ended with a perfectly functioning timekeeper for his Yorkshire garden. No cogs, cams or elaborate machinery were required – just a terrazzo sphere with a plastic linear scale of time which could be manually adjusted, when necessary, using the now universally available smart phone.

He demonstrated that most DIY diallists could manufacture a replica using cheap readily available plastic strips and a very minimum of practical skills. To prove it, he brought along a lightweight working model for the conference exhibition (Fig. 5). After the presentation two attendees were examining the exhibit. They were convinced that the only way it could accommodate the EoT and BST was for the time scale to be free to rotate. John was happy to rotate the scale for them and they left the exhibit satisfied that the details in the presentation were correct.

Fig. 5. The dial in John's rose garden clearly telling civil time without needing corrections for the EoT or BST.

Andrew Theokas: *John Goodricke and the Period of the Demon Star*

This presentation by Andrew Theokas on the achievements of the young Yorkshire astronomer John Goodricke was based on his extensive research for *Goodricke's Time* (below). It is an historical novel but not an alternative history. In a departure from typical talks, it was not about sundials, but still about the important rôle of time in early astronomy.



Goodricke practised astronomy in late 18th century England and made his groundbreaking observations from a Treasurer's House window in York. He was unassuming and humble, despite his genius. He was also deaf. It may have been the Enlightenment, but prospects for a deaf child were bleak in a society more callous than caring. His parents,

however, were determined. They discovered the first school for the deaf in all Great Britain, which placed him on the path leading to his later pioneering work.

Goodricke's discovery of short period variable stars brought mathematical order to what had been a mystery. Deafness may have placed him at the margins of life, but astronomy drew him to the centre of English intellectual activity and eventually to the rich legacy his early work in astronomy has left us.

At this point in the programme there should have been another York-related talk, by **John Davis** on *Thomas and Joshua Mann – Engravers and York Virtuosi*, which he had prepared for the cancelled April 2020 Conference. Sadly, John was unwell and unable to attend. His article, with the same title and based on the talk, was published in the *BSS Bulletin*, 32(ii), 2-7 (June 2020).

Johan Wikander: *The Hours 0–24*

In the middle of the 1880s a discussion started in Norway: Should we establish time zones in our country? This was a difficult discussion because Norway stretches from 5°E to 31°E at the Russian border. Our parliament, Stortinget, decided 10 years later. European standard time was established from 1 January 1895 for the whole country. Detailed information about the new system was then published.

The international conference about telecommunications held in Lisbon in 1908 recommended a lot of proposals for a common standard. One of them was to establish the hours 0–24 when telegrams were sent and received, to avoid misunderstandings. This proposal was established in Norway in 1913.

At that time a discussion started in the railway administration: Should the timetables also be changed to the 0–24 hour system? The final decision was taken in the European timetable conference in Baden-Baden, Germany, in mid-October 1926. Norway, Denmark, Sweden and Germany decided to change the timetables on 15 May 1927. In Norway, in addition to black numerals 1–12, clocks in railway stations had the numerals 13–24 painted in red. A couple of years later, all steamboat companies had also changed their timetables.

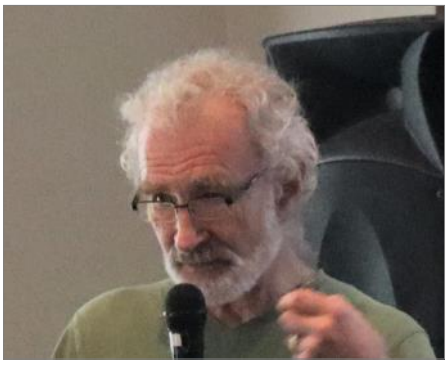
In 1936 an American, Mr Scott from West Virginia, wrote a letter to the Norwegian foreign department and

asked about our experience with the "24 hours clock". Norway was very satisfied, especially the railway administration for safety reasons.

In 1939 the railway administration established a new standard for their clocks. The numerals were cut out, then only 12 radial marks around the clock identified the hours. The minutes were identified with smaller radial marks.

Chris Lusby Taylor: *Sundial Design and Delineation Using 3D Point Clouds*

Chris Lusby Taylor presented his method of designing sundials from point clouds: the 3D images produced by the latest surveying equipment. This was how the huge Fleet Street Sundial was laid out (Fig. 6). Chris showed how computer programs can calculate and display the exact appearance of a gnomon's shadow



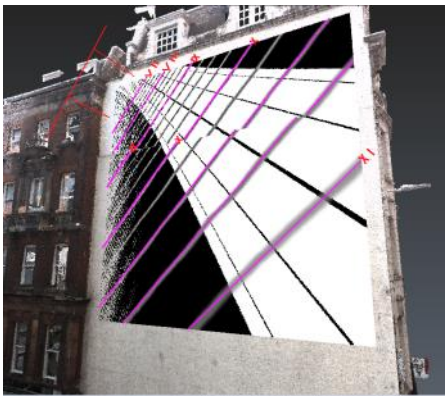


Fig. 6. Gnomon, shadows, hour and declination lines superimposed on the 3D point cloud image of 62 Fleet Street.

at any time and give positions of all best-fit hour and declination lines. His program can show contours that indicate where a wall is less than perfectly flat. All this was achieved with a single, simple ground-based survey even for the 16 metre by 11 metre Fleet Street site – believed to be the largest timepiece in London.

Piers Nicholson: *Open House London 2022*

Piers reported that the new Fleet Street sundial had been selected as one of the venues for Open House London, 8–21 September 2022; he had agreed to provide a volunteer to give a short talk at 10-minute intervals from 9 am to 11 am on as many days as possible during this period. This would be a great opportunity to publicise the British Sundial Society.

Saturday Afternoon

After lunch it was time to go out into the sunshine to explore the centre of York and to hunt for sundials with the aid of Louise Smail's map. Two of the three stained glass dials proved a slight challenge. Few of us managed to get into the Merchant Adventurers' Hall before it closed, but those who had arrived early for the conference, or who stayed on after Sunday lunch, were able to visit and to see Chris Daniel's dial in the chapel (and admire the wonderful old building). It was known that the Henry Gyles dial in the Art Gallery would probably not be available for view, but Gray's Court Hotel welcomed members to see the attractive stained glass dial there.

After the Treasurer's House (National Trust), there were several sundials to be seen, in particular the much-photographed newly-restored multiple dial on College Green. It is not recorded how many BSS members reached St Peter's School in Bootham; it is known, however, that welcome cups of tea were enjoyed in some of the nearby cafés.

Gray's Court stained glass dial by Henry Gyles, SRN 2947.

The recently restored multiple dial on College Green, SRN 0271.

Vertical dial above the doorway of the Minster's South Transept, SRN 1157.

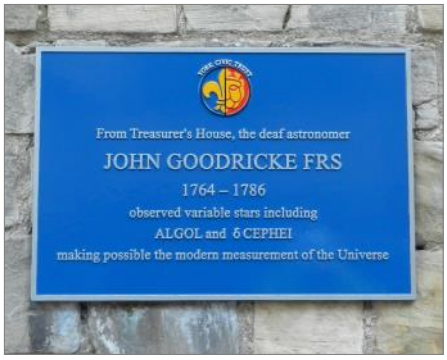
Back at the hotel, the bar opened for more socialising, and the excellent Gala Dinner followed.

Sunday 24 April

Werner Riegler: *Novel Sundials with Equation of Time Correction*

The first dial presented was an equatorial sundial with a double style built in 2003. The novelty of the dial is a shaped double style where the outer part is made semi-transparent, such that two shadows are produced. Instead of changing the style twice a year one therefore just has to choose the correct shadow for the time reading. Full details can be found at *https://riegler.web.cern.ch/sundial/mainpage.htm*

The second dial is a globe dial built in 2021 (Fig. 7). A pierced style with an analemma cutout, that rotates around the axis, is used to indicate the civil time and allows the reading of the date.



Plaque on the garden wall of the Treasurer's House.

The dial at St Peter's School, Bootham, SRN 3276. Photo: Roger Stapleton.

A so called 'digital' sundial is at present under construction (Fig. 8). A stainless-steel ring of 4 metres diameter with cutouts of digits representing 10-minute intervals projects the time onto a display that is placed on the axis of the ring. This display of 2 metres length and 0.4 metres width can be rotated and shows half of the analemma on each side. The civil time and date are read at the intersection of the analemma and the projected digits.

Another dial being designed at the moment is a large armillary sphere of 2 metres diameter. An ecliptic ring indicating the position of the true sun on each day and an equatorial ring with the position of the mean sun on each day is placed on the rotating celestial sphere. Using a so-called 'coulisse', the true sun on the armillary sphere is aligned with the real sun, and the civil time can then be read on the celestial equator using the corresponding mean sun. This

Fig. 7. Globe sundial with analemma.

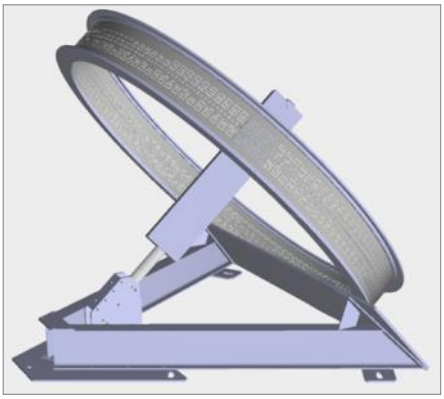


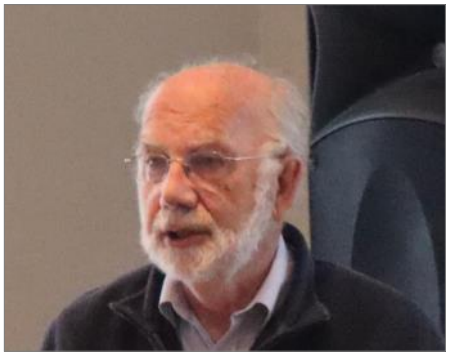
Fig. 8. CAD design of a digital sundial.

sundial is therefore generating the equation of time from 'its true origins'. By rotating the two rings according to the precession of the equinoxes, the correct EoT can be generated for many millennia to come.

Also presented were ideas about heliochronometers built in a 'clock' style with a mechanism that can generate the EoT to high precision. The principle is taken from the old tide calculation machines that mechanically generate and add a large number of Sine waves of different amplitudes and phases to predict the tides. For use in a heliochronometer one can approximate the EoT as a Fourier series, and use the first four terms of this series to generate the EoT mechanically. As in the old tide calculation machines, the amplitudes and phases for the different components can be adjusted, so the mechanism can generate the correct EoT over the millennia.

David Brown: *Dial Dabblings Down Under*

David Brown presented an account of his encounters with sundials during a three-week family visit to Hobart, Tasmania, over the Christmas and New Year period. During the visit he had made a 150-mile safari round trip which had included two 'moving' dials by Tony Sprent, an Art Deco style war memorial sundial and dials whose pedestals incorporated carvings by a celebrated convict stonemason, Daniel Herbert. A full description will appear in the next issue of the *Bulletin*. At the conclusion of his talk, David showed some 'sundial' seashells that he had picked up on the beach in Hobart, probably named on account of the wonderful markings on the underside being akin to the chapter-ring markings on a real sundial.



Doug Bateman: *The History of the Greenwich Time Ball (Fig. 9)*

The talk began with the very start of the time ball, which was due to a naval captain who suggested several times to the Admiralty that an "instantaneous signal" be set up at ports to enable ships' chronometers to be checked whilst on board the ship. A prototype was constructed at Portsmouth in 1829.

Finally, instruction was given to the 6th Astronomer Royal, John Pond, to set up such a ball. Engineered by Henry Maudslay Sons and Field Ltd, the ball was set up in 1833: the main features are largely unchanged. Doug's direct involvement came about because of his experience with radio time signals, the upshot being that he was commissioned to advise on the replacement of the electrically operated pendulum clock, and then to make a controller taking the time from MSF; this worked for a number of years before the site suffered a massive lightning strike. Subsequent controllers used a PC and, currently, time from GPS. The talk also covered the derivation of the time from the transit telescope, which involved young men 'computers' carrying out the lengthy calculations using 7-figure log tables. From his historical research into the time ball, at this point in the talk, Doug showed a page from contemporary tables by Charles Babbage. He had given this talk several times before, and would often ask whether the hearers still had their 4-figure log tables, and quite a few hands would go up. As he usually did, he then asked whether any members had 7-figure tables; to his surprise and astonishment more than half-a-dozen hands went up. Sundial enthusiasts are a very odd crowd!

Fig. 9. The time ball at Greenwich – the first accurate time signal for the public.

The Andrew Somerville Memorial Lecture

Dr Gloria Clifton: *Professional Sundial Makers in the British Isles, from the late Sixteenth to the Twentieth Centuries*

The talk aimed to examine the kinds of trades and crafts from which sundial makers were drawn and how this changed over time.

Examples of dials from the 16th century include simple pocket sundials, usually of wood (commonly carried by seamen), a ring dial said to have been made by William Buckley in 1546 and a horary quadrant made for Edward VI by Thomas Gemini. Evidence for the 16th century comes mainly from the records of the Crown or from surviving expensive metal instruments. It is difficult to find out about wooden instruments made before the 17th century.

Few specialist sundial makers sold directly to the public, most supplying a variety of shops. It is hard to discover the craft background of these makers, so we cannot say how they acquired their skills. In the 18th century, although many sundials were sold, especially by mathematical instrument makers and clockmakers, no sundial specialists have so far been identified. In the 19th century, Richard Melville or Melvin was a rare example of a specialist sundial maker, selling elaborately engraved slate dials directly to customers rather than supplying other retailers. He may have learnt engraving as a maker of slate headstones, adapting the skill to making dials.

In the 16th century the earliest known makers were generally metal engravers, often associated with the printing trade such as Thomas Gemini; Augustine Ryther and his apprentice Charles Whitwell; also Humfrey Cole, whose career began at the Royal Mint. Another group of craftsmen who made sundials in the 16th century were clockmakers, including Brise Augustyn, Vincent Kenney, Nicholas Kratzer, Bartholomew Newsam, Nicholas Oursian and Antony Tressyl, all involved in making clocks and often dials for Tudor monarchs.

There were also humbler artisans making mathematical instruments in wood in the later 16th and early 17th centuries, identified from advertisements in books. By the mid-17th century the better-known makers produced instruments in a variety of materials: for example, Henry and William Sutton sold instruments in both brass and wood. The National Maritime Museum's collections has a horary quadrant by Henry Sutton, made from printed paper pasted onto wood. However, we do not know whether they worked in a variety of materials themselves, or employed craftsmen with different skills, or bought items from elsewhere.

By the mid-17th century most craftsmen who signed sundials which have survived were mathematical instrument makers, although clockmakers such as Thomas Tompion continued to produce sundials.

As there was no guild specifically for mathematical instrument makers until the mid-20th century, these craftsmen appeared in many City Companies. When the Clockmakers' Company was formed in London in 1631 it claimed the right to enrol them, but many remained in other guilds. One of the first to join was Elias Allen, who had been made a Freeman of the Grocers' Company in 1612.

The domination of sundial making by mathematical instrument makers continued in the 18th century, especially in London. Some of the finest dials were the work of those who could trace a master–apprentice line back to Elias Allen, either in the Grocers' or in the Clockmakers' Company, including Richard Glynne (Clockmakers') and George Adams, senior and junior, Edmund Culpeper, Thomas Heath and Benjamin Scott (Grocers').

By the second half of the 18th century and throughout the 19th century, mathematical instrument making was often combined with philosophical and optical instrument making ('opticians'). Such makers produced sundials and included the Dollond family, Edward Nairne and Henry Pyefinch, members of the Spectaclemakers' Company, and the Adamses of the Grocers' Company. The Dollond business continued in family ownership until well into the 19th century; however, they employed a number of craftsmen so may not have made all their dials. Leading clockmakers like Edward Dent in the mid-19th century also made sundials.

Instrument makers may have dominated sundial making in London, but in the provinces many dials were made by mathematics teachers, land surveyors or clockmakers.

The 19th-century *Post Office London Directory* listed sundial makers from the 1850s onwards, although these makers all had other trades. Some were metal founders, masons or fountain makers, who presumably supplied sundials largely as garden ornaments, whereas instrument makers like Francis Barker & Son made pocket as well as garden dials.

As the 20th century progressed, sundials increasingly became ornamental or commemorative, rather than just a means of finding time. In the early part of the century the Pilkington & Gibbs heliochronometer provided a more sophisticated timekeeper, with allowance for the EoT, but other ways of obtaining an accurate time-check, such as radio time signals from the Royal Observatory, Greenwich, soon superseded it.

The talk concluded with an illustrated history of sundials at Greenwich (see Figs 10 and 11) illustrating the fact that sundials being made nowadays are generally designed by professionals for buildings or gardens and generally made by bronze casters, monumental masons and engravers working under

John Davis

Fig. 10, The dolphin dial, celebrating the Silver Jubilee of HM Queen Elizabeth II, in its new location at the Greenwich Observatory. SRN 2157.

John Davis

Fig. 11. The Meridies Media noon mark at Greenwich, re-created to celebrate the Diamond Jubilee of HM Queen Elizabeth II. SRN 8324.

their guidance – a rather different situation from the history of sundial making in the British Isles until the early 20th century, which was dominated by clockmakers and mathematical or scientific instrument makers.

This marked the end of the formal part of the proceedings, and Doug Bateman was given a vote of thanks and a well deserved round of applause for organising a most enjoyable conference.

The photos of the speakers are by Doug Bateman, and the notes (and most of the accompanying Figures) are by the speakers themselves.

Charity number: 1155688

The British Sundial Society

Report of the Trustees and Unaudited Financial Statements

For the year ended 31 December 2021

The British Sundial Society
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Report of the Trustees
For the year ended 31 December 2021

The Trustees have pleasure in presenting their report and the financial statements for the charity for the year ended 31 December 2021. The Trustees have adopted the provisions of Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and the Republic of Ireland (FRS 102) (effective 1 January 2019).

Chair's report

TRUSTEES' ANNUAL REPORT 2021

For a second year the Society and its members were again subject to the ups and downs of the pandemic. Whilst this again curtailed the Society's and members' activities in person, the year witnessed a dramatic burgeoning of the Society's virtual footprint - resulting in a substantial extension of the Society's public benefit.

Following the very difficult experience of the Covid enforced late cancellation of the 2020 conference, the trustees decided to cancel the 2021 conference early - it was not marketed at all. With the benefit of hindsight this was exactly the right decision. Also during the year the decision was taken to hold a 2022 conference in York.

In place of our normal face-to-face conference, a Zoom call was held on 17 April 2021. Approximately 150 participants - both BSS members and the general public - heard talks from Roger Bailey, Fred Sawyer and Woody Sullivan, introduced by Frank King. About 80% of participants rated the event as "excellent" and the overall reaction was very positive with enthusiasm for further such events. The video recording was watched some 400 times during the year on our website.

The year also saw further substantial additions of new content to the website - the online publication of the Society's Bulletin archive. This is not only a convenience to members but a significant public benefit - as the sum total collective dialling wisdom of the Society's existence, it's hard to think of anything bigger!

As well as the Zoom video and Bulletin archive additions to the website, Bridol has also been updated, and work is underway to provide equivalent capabilities for mass dials.

Happily, it was possible to hold the Newbury September 2021 Meeting - the first face-to-face Society gathering for two years! It was well attended and, given the earlier annual conference cancellations, the occasion was used to hold an AGM.

The Society's finances remain capable of supporting current activities and plans for the foreseeable future.

The entirety of the Society's activities are conducted on a voluntary basis by members. As always, the trustees wish, on behalf of all members, to thank all those who contribute to our continuing success.

Jackie Jones, Frank King, Graham Stapleton, Bill Visick, Chris Williams

EXAMPLES OF INDIVIDUAL PROJECTS AND DIALS

Extracts from the 2021 public benefit submission to the Charity Commissioners:

·Members constructed new sundials in public locations - Fleet Street (Corporation of London); Winwick Hall (Northamptonshire); National Trust Piles Mill, Allerford (Somerset).

·Members' restorations to historic public sundials - Drummond Castle Gardens (Perthshire); Inverleith Park (City of Edinburgh).

·Research findings on local sundials shared with the community - Kew (Richmond upon Thames); Madeley (Shropshire); Radcliffe on Trent (Nottinghamshire); Canterbury (Kent); six communities in West Somerset; multiple locations in Scotland and Wales.

·The five-yearly update of the national Register of Mass Dials was published, being made available to members and academic bodies at a subsidised price. This is the most detailed reference of its kind.

·Zoom talks on sundials - Baconian Society (St. Albans); Cambridgeshire Historic Churches Trust; Dartford Astronomical Society (Kent).

·Digital mapping of sundials in the British Isles was continued, enabling members to be Citizen Scientists, reporting extra data for the national database.

In addition public benefit was substantially increased by the website's new content - the Bulletin archive of some 100 editions and the 2021 Zoom call video.

THE BULLETIN

In 2021, the usual four quarterly issues of the Bulletin were published. Following a review, the University of Cambridge has now permanently withdrawn the desktop publishing facilities which were used by the Editorial Team until March 2020. In consequence we are continuing to use the less satisfactory desktop publishing suite which we set up in the summer of 2020.

It was again not possible to hold the Annual Conference in April so there was no associated set of reports but, happily, the Newbury Meeting was held in September and reports of the talks given there were published in the December Bulletin.

The Bulletin Team includes John Davis, Frank King, Christine Northeast and Bill Visick. Very sadly, Fiona Vincent, who was our regular proof reader, died in September.

The Team are most grateful to all members of the Society who supply us with articles and to those whom we call on for expert comment and advice.

The Editorial Team

FIXED DIAL REGISTRAR

The Register now holds 7,730 dials (94.5% with photographs), supported by 12,846 reports. New dial reports come in at one or two a week on average.

Properly authenticated reports are now welcomed from non-members, and a Registrar's report procedure allows dials to be entered from authorised internet sightings.
John Foad

MASS DIAL REGISTRAR

Thanks are due to Bill Visick and John Foad for sorting out the database and getting it to work.
Some thirty reports were made in 2021. Most of these were just an email with the name of the church along with some nice clear digital pictures of the dial and where it is to be found on the building. A few full reports with dimensions are still being made using the MD report form. This form can now be filled in digitally and emailed rather than the pen and paper and post of old.
There were two enquiries from researchers. One asked how many empty circles we have in our database. We have approximately 118. The other enquiry asked about mass dials on secular buildings; there are fewer than ten recorded to date. Thanks to Bill Visick for extracting the information.
There has been no progress with getting the paper records held in The Borthwick Institute for Archives into the MD database. With a bit of luck some progress will be made in the coming year.
Ben Jones

WEBSITE

There has been encouraging growth in website usage with annual visitor numbers increasing by about 60% year-on-year. Almost two thirds of the increase was a result of improving our visibility to Google's search algorithms which was in turn supported by publishing the Bulletin archive. The Zoom conference in April also led a number of new users to our site.
Adding the contents of almost 100 editions of the Bulletin represents a huge increase in breadth and depth of dialling material available on the web. Bridol has also been updated, with more in the pipeline, and work is underway to provide equivalent capabilities for Mass Dials and to provide the capability for online reporting of mass dials.
Contributions but also suggestions for new topics for the website are always welcome.
Bill Visick

CONFERENCES

Following two fallow years, 2020 and 2021, we plan to hold the 2022 York conference in the very central Hilton hotel. In addition Louise Smail is planning a walking tour to see some sights and sundials. Offers of talks have been coming in and we have Gloria Clifton, highly qualified in instruments and dials, to give the Andrew Somerville Memorial Lecture.
The Exeter conference remains planned for 2023 at the Mercure Exeter Southgate. Hopefully by then Covid-19 will have receded from the forefront of our minds.
The Conference Team

NEWBURY MEETING

The Newbury one day meetings continue to be well attended as evidenced by the 2021 meeting. Thanks to all for supporting the event. The usual venue has been booked for September 2022.
David Pawley

HELP AND ADVICE SERVICE

The service has had another very busy year dealing with 103 enquiries - a 13% increase on the previous year. Queries come from private individuals, architects, churchwardens, historians, museums, academic institutions, students, antique dealers, magazine and book writers and the press.
Queries fell into the following categories: where/what to buy (4), restoration (13), replacement gnomon (2), valuation (3), delineation (4), information about an existing dial (65) and other (12). The 'other' category included requests for information on seasons in the southern hemisphere, clock time vs. solar time, stained glass sundials in the 17th century and church burial practices!
There were 25 enquiries from overseas: USA (7), France (5), Australia (2), Ireland (2), Russia (2) and one each from Italy, Finland, Norway, Pakistan, South Africa, Switzerland and Venezuela.
About 70% of our replies received an acknowledgement - a thank you or further discussion. Enquiries have resulted in one new member and three articles for the Bulletin.
Sue Manston

LIBRARY

As Bromley House has, because of the pandemic, been either closed or with restricted opening for most of the year, there is

nothing really to report. No new volumes have been added to the Library and no enquiries about materials in the BSS Collection.
John Wilson

BIOGRAPHICAL PROJECTS

Receipt, via the Secretary at the Newbury meeting, was taken of Jill Wilson's paper files. These will be stored, but are unlikely to be used. As reported last year the master file is the electronic version. That is in the process of being updated with new content from the past few years of Bulletins, plus contributions received via email. Details of newly recorded makers are recorded together with downloaded pictures and references.
Since the 3rd edition of the Biographical Index has only recently been published, an update is not to be expected in the near future.
Peter Ransom

PHOTOGRAPHIC

2021 was intended to be a 'between' year for the biennial Photographic Competition. It had originally been intended to have displayed photographs of the entries to the Sundial Design and Restoration Competition at the 2021 conference. Alas this was cancelled - as was the previous conference's 2020 Photographic Competition display.
In lieu of a 2022 photographic competition it was therefore decided to display photographs of these two competitions at the 2022 annual conference for delegates perusal.
The return of the Photographic Completion will be announced in due course.
David Hawker

SALES

It was quiet on the sales front apart from a flurry of activity at the end of the year when John Davis' BSS Monograph 14, 'The Portable Saxon Sundial at Canterbury Cathedral', was published.
It was a pleasure to have a sales counter open again at Newbury after such a long pandemic break.
A catalogue of the non-BSS titles currently in stock has been prepared. Please apply directly to me if you would like a copy.
Elspeth Hill

MEMBERSHIP

At the end of 2021 there were 288 members. Of these, 17 receive a free copy; they are mainly other sundial societies. Of the paying members, 198 are in the UK; 37 in the rest of Europe and 36 from the rest of the world.
There was an increase in new members - 16 joined compared with 10 in the previous year. But 16 left for a variety of reasons - 5 have died (and have been mentioned in the Newsletter), some had a change of interest or health, and others gave no reason.
Jackie Jones

OBJECTIVES AND ACTIVITIES

Objectives and aims

The trustees have considered the Charity Commision's guidance on public benefit, including the guidance 'public benefit: running a charity (PB2)'.
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.

FINANCIAL REVIEW

Reserves

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.

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 their annual review of the controls over key financial systems, 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.

The British Sundial Society
Report of the Trustees Continued
For the year ended 31 December 2021

REFERENCE AND ADMINISTRATIVE INFORMATION

Name of Charity	The British Sundial Society
Charity registration number	1155688
Principal address	99 Western Road Lewes East Sussex BN7 1RS

Trustees

The trustees and officers serving during the year and since the year end were as follows:

Frank King
Chris Williams
Jackie Jones
Graham Stapleton
Bill Visick

Secretary	Chris Williams
Independent examiner	Andrew M Wells FMAAT Counterculture Partnership LLP Unit 115 Ducie House Ducie Street Manchester M1 2JW
Bankers	The Co-operative Bank plc PO Box 101 1 Balloon Street Manchester, M60 4EP

Approved by the Board of Trustees and signed on its behalf by

Frank H. King

..... 18 May 2022

Frank King

The British Sundial Society
Independent Examiners Report to the Trustees
For the year ended 31 December 2021

I report to the trustees on my examination of the accounts of the charity for the year ended 31 December 2021.

Responsibilities and basis of report

As the charity trustees, you are responsible for the preparation of the accounts in accordance with the requirements of the Charities Act 2011 ('the 2011 Act').

I report in respect of my examination of the charity's accounts carried out under section 145 of the 2011 Act and in carrying out my examination I have followed all the applicable Directions given by the Charity Commission under section 145(5)(b) of the Act.

Independent examiners statement

I have completed my examination. I confirm that no matters have come to my attention in connection with the examination giving me cause to believe that in any material respect:

1. accounting records were not kept in respect of the Charity as required by section 130 of the 2011 Act; or
2. the accounts do not accord with those records; or
3. the accounts do not comply with the applicable requirements concerning the form and content of accounts set out in the Charities (Accounts and Reports) Regulations 2008 other than any requirement that the accounts give a 'true and fair view' which is not a matter considered as part of an independent examination.

I have no concerns and have come across no other matters in connection with the examination to which attention should be drawn in this report in order to enable a proper understanding of the accounts to be reached.

Andrew M Wells FMAAT
Counterculture Partnership LLP
Unit 115 Ducie House
Ducie Street
Manchester
M1 2JW

18 May 2022

The British Sundial Society
Statement of Financial Activities
For the year ended 31 December 2021

	Notes	Unrestricted funds	Restricted funds	2021	2020
		£	£	£	£
Income and endowments from:					
Donations and legacies	2	2,292	-	2,292	2,175
Charitable activities	3	10,689	-	10,689	11,111
Investments	4	6	-	6	150
Total		**12,987**	**-**	**12,987**	**13,436**
Expenditure on:					
Charitable activities	5/6	(11,063)	-	(11,063)	(10,914)
Other expenditure		(3,072)	-	(3,072)	(3,006)
Total		**(14,135)**	**-**	**(14,135)**	**(13,920)**
Net income/expenditure		**(1,148)**	**-**	**(1,148)**	**(484)**
Reconciliation of funds					
Total funds brought forward		77,303	7,146	84,449	84,933
Total funds carried forward		**76,155**	**7,146**	**83,301**	**84,449**

The British Sundial Society
Statement of Financial Position
As at 31 December 2021

	Notes	2021	2020
		£	£
Fixed assets			
Tangible assets	11	17,228	17,228
		17,228	**17,228**
Current assets			
Debtors	12	11,735	11,744
Cash at bank and in hand		55,564	56,198
		67,299	**67,942**
Creditors: amounts falling due within one year	13	(1,226)	(721)
Net current assets		**66,073**	**67,221**
Total assets less current liabilities		**83,301**	**84,449**
Net assets		**83,301**	**84,449**
The funds of the charity			
Restricted income funds	14	7,146	7,146
Unrestricted income funds	14	76,155	77,303
Total funds		**83,301**	**84,449**

The financial statements were approved and authorised for issue by the Board and signed on its behalf by:

Graham Stapleton
Trustee
18 May 2022

The British Sundial Society
Notes to the Financial Statements
For the year ended 31 December 2021

1. Accounting Policies

Basis of accounting

The financial statements have been prepared under the historical cost convention, except for investments which are included at market value and the revaluation of certain fixed assets and in accordance with the Charities SORP (FRS 102) 'Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) (effective 1 January 2019)', Financial Reporting Standard 102 the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102), and the Charities Act 2011.

The British Sundial Society meets the definition of a public benefit entity under FRS 102. Assets and liabilities are initially recognised at historical cost or transaction value unless otherwise stated in the relevant accounting policy note(s).

Going concern

The financial statements are prepared, on a going concern basis, under the historical cost convention.

Change in accounting policy

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).

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.

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.

Donated goods, services and facilities

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.

Resources expended

Liabilities are recognised as resources expended when there is a legal or constructive obligation committing the Charity to the expenditure:

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.

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

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.

Tangible fixed assets

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

2. Income from donations and legacies

	2021	2020
	£	£
Unrestricted funds		
Donations received	1,292	2,175
Legacies received	1,000	-
	2,292	**2,175**

3. Income from charitable activities

	2021	2020
	£	£
Unrestricted funds		
Promoting the Art and Science of Gnomonics		
Day Meetings	270	-
Sales	596	1,134
Subscriptions	9,823	9,977
	10,689	**11,111**
	10,689	**11,111**

4. Investment income

	2021	2020
	£	£
Unrestricted funds		
Bank interest receivable	6	150
	6	**150**

5. Costs of charitable activities by fund type

	2021	2020
	£	£
Unrestricted funds		
Promoting the Art and Science of Gnomonics		
Direct cost		
Bulletin/Publication	9,335	9,734
Day Meetings	291	-
Events	510	227
Postal Sales	172	71
Travel	-	115
	10,308	**10,147**
Support costs		
Promoting the Art and Science of		
Governance costs		
Accountancy fees	720	732
Legal fees	35	35
	755	**767**
	11,063	**10,914**

6. Costs of charitable activities by activity type

	2021	2020
	£	£
Activities undertaken directly		
Promoting the Art and Science of Gnomonics	11,063	10,914

7. Analysis of support costs

	2021	2020
	£	£
Governance costs		
Accountancy fees	720	732
Legal fees	35	35
	755	**767**

8. Net income/(expenditure) for the year

This is stated after charging/(crediting):

	2021	2020
	£	£
Accountancy fees	720	732

10. Comparative for the Statement of Financial Activities

The comparative year values on the Statement of Financial Activites are for unrestricted funds.

11. Tangible fixed assets

	Library
Cost or valuation	
	£
At 01 January 2021	17,228
At 31 December 2021	**17,228**
Net book values	
At 31 December 2021	**17,228**
At 31 December 2020	**17,228**

12. Debtors

	2021	2020
	£	£
Amounts due within one year:		
Trade debtors	1,156	1,165
Prepayments and accrued income	10,579	10,579
	11,735	**11,744**

13. Creditors: amounts falling due within one year

	2021	2020
	£	£
Accruals and deferred income	1,226	721
	1,226	**721**

14. Movement in funds

Unrestricted Funds

	Balance at 01/01/2021	Incoming resources	Outgoing resources	Balance at 31/12/2021
	£	£	£	£
General				
General Fund	77,303	12,987	(14,135)	76,155
	77,303	**12,987**	**(14,135)**	**76,155**

Unrestricted Funds - Previous year

	Balance at 01/01/2020	Incoming resources	Outgoing resources	Balance at 31/12/2020
	£	£	£	£
General				
General Fund	77,787	13,436	(13,920)	77,303
	77,787	**13,436**	**(13,920)**	**77,303**

Purpose of unrestricted Funds

General Fund

The purpose of this fund is for the general running of the chairlty

Restricted Funds

	Balance at 01/01/2021	Balance at 31/12/2021
	£	£
Andrew Somerville Memorial Fund	5,998	5,998
St Katharine Cree Restoration Fund	1,148	1,148
	7,146	**7,146**

Restricted Funds - Previous year

	Balance at 01/01/2020	Balance at 31/12/2020
	£	£
Andrew Somerville Memorial Fund	5,998	5,998
St Katharine Cree Restoration Fund	1,148	1,148
	7,146	**7,146**

Purpose of restricted funds

Andrew Somerville Memorial Fund

The Andrew Somerville Memorial Fund is part of the general BSS Assets, but its use is restricted to funding the annual Andrew Somerville Lecture and restoration and educataion grants, should these be made.

St Katharine Cree Restoration Fund

The purpose of the fund is for the restoration of the sundial at St. Katharine Cree Church, Leadenhall Street, City of London.

15. Analysis of net assets between funds

	Tangible fixed assets	Net current assets / (liabilities)	Net Assets
	£	£	£
Unrestricted funds			
General			
General Fund	17,228	58,927	76,155
Restricted funds			
Andrew Somerville Memorial Fund	-	5,998	5,998
St Katharine Cree Restoration Fund	-	1,148	1,148
	17,228	**66,073**	**83,301**

Previous year

	Tangible fixed assets	Net current assets / (liabilities)	Net Assets
	£	£	£
Unrestricted funds			
General			
General Fund	17,228	60,075	77,303
Restricted funds			
Andrew Somerville Memorial Fund	-	5,998	5,998
St Katharine Cree Restoration Fund	-	1,148	1,148
	17,228	**67,221**	**84,449**