The British Sundial Society

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NOTE: The Contents Listing is repeated in each Bulletin.

The British Sundial Society

INTRODUCTION

The first three issues of the British Sundial Society Bulletin, 89.1 July 1989, 89.2 November 1989, and 90.1 February 1991 were produced on an Amstrad PCW 8512 word processor and a matrix dot printer, followed by photocopying in bulk. Reproduction by this system was unsatisfactory in spite of using printer ribbons for one impression only. However the Bulletin and its despatch to individual British members cost less than a pound per copy.

These early issues do not fit in well with the present format and most are showing signs of wear and tear. Additionally many of the present members joined when the first three issues were already out of print. In 1993 the BSS Council made the decision to have the three early Bulletins reprinted in the present format.

Since the original pages were typescript, it has not been possible to produce exact replicas of these, for the printed version takes up much less space. A small amount of the material has had to be relocated in the new version, so when quoting references from the early issues, the source must be made clear.

May 1989 was the date of the founding of the British Sundial Society, this reprint marks the quinquennial anniversary.

Charles K. Aked

Editor BSS Bulletin

BULLETIN

No. 89.1 **JULY 1989**

ISSN 0958-4315

HONORARY OFFICIALS OF THE BRITISH SUNDIAL SOCIETY

PATRON: THE RT. HON. THE EARL OF PERTH P.C.
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VICE-PRESIDENT: M. RENÉ R.-J. ROHR (France)

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ADVISERS: MR. PETER I. DRINKWATER, MR. E. J. TYLER

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BULLETIN 89/1 - JULY 1989

THE BRITISH SUNDIAL SOCIETY

BULLETIN NUMBER 89.1

JULY 1989

The British Sundial Society was founded on 5 May 1989 at Chingford, Essex; the founding members being Dr A. R. Somerville, Mssrs. Charles K. Aked, David A. Young and Christopher St. J.-H. Daniel. Until a full members' meeting takes place, Andrew Somerville will act as Chairman, David Young as Treasurer, with Charles Aked as Bulletin Editor. Nearly 100 persons have written to express interest in the new Society, and this first Bulletin is going to almost 80 who are paid-up members. An application form is included to pass on to friends who may wish to join. The Society is intended for those interested in sundials, fixed or portable, the various facets of dialling and gnomonics, including the history and literature, and the many subsidiary subjects connected with dialling. The aims and objects of the new Society were given in the preliminary letter as follows:

a) To promote the Science of Gnomonics and the knowledge of all types of sundials.
b) To catalogue the dials which still exist in the British Isles, and research their history.
c) To advise on the preservation and restoration of sundials and the construction of new examples.
d) Periodically to publish and circulate a Bulletin or Journal to members, containing original articles, reports from other Sundial Societies, news and other items of interest.

These items are open for discussion and your views will be welcome either for the *Bulletin* or through the questionnaires already sent out. These, with any changes, will be ratified at the First Meeting of the Society.

Primarily the contents of the *Bulletin* will depend upon the contributions of our members, however material which is normally inaccessible to enthusiasts, by scarcity or language barrier, will also be published from time to time. Much of the information on dialling is in the form of articles in relatively obscure magazines.

Should interest in the subject increase, as it is confidently expected, the growing number of members may eventually permit a journal on sundials to be printed, at present a photocopied version is as much as the new Society can manage. If each member can persuade other enthusiasts to join, the production of a journal of a standard commensurate with the importance of the subject cannot be long delayed.

The Editor welcomes suggestions and short articles from members. Programmes involving large amounts of endeavour and time, will have to be allotted to groups of individuals. For example it is hoped to compile a complete listing of all the sundials in the British Isles, an impossible task for any one individual on his (or her) own. By division into suitable areas allocated to one or two workers, this immense task may be tackled and completed in a reasonable period of time. Similarly the extraction of articles from publications of the past will require a number of workers, the field is too wide for any one researcher to accomplish single-handed.

In respect of the latter, the editor has compiled two lists of dialling references, each of approximately one thousand entries, which he hopes to publish in the near future. A third listing is being undertaken, for which further references would be welcomed.

CHARLES K. AKED.

HONORARY OFFICIALS OF THE BRITISH SUNDIAL SOCIETY

OUR PATRON: THE RT. HON. THE EARL OF PERTH P.C.

I am pleased to announce that Lord Perth has accepted our invitation to become Patron of the British Sundial Society. He has long been interested in sundials and has some very fine examples in his gardens at Stobhall, near Perth. The tradition of sundials has been in his family for a long time: his ancestor, Earl John, commissioned an obelisk dial, the first of its type, for Drummond Castle near Crieff; this was made in 1630 by John Mylne, master mason to King Charles I. Mylne also made for Earl John, in about 1643, the fine multi-faceted dial which is the centre piece of the formal garden at Stobhall to this day. The superbly carved prism dial at Holyrood Palace, commissioned for the Scottish coronation of Charles I at Holyrood in 1633, is also by Mylne and his sons. These three dials are amongst the earliest of the Scottish monumental dials, and it is very probable that Mylne, under the patronage of the Earl of Perth, set the fashion for these which swept through Scotland in the 17th century. It is, therefore, particularly appropriate that the present Earl should be the Patron of our new society. He has recently commissioned and installed two fine glass window dials by the Kirkcudbright glass engraver, David Gulland, and his neighbour George Higgs, both of whom are members of the Society.

HONORARY PRESIDENT: DR. F.A.B. WARD

Dr. Frank Ward is probably the most widely experienced diallist in Britain. Following his training in physics at Cambridge, and later an assistant to Sir Ernest Rutherford, he became an Assistant Keeper at the Science Museum, London, in 1931. Following his wartime service in the Air Ministry, he returned to the Science Museum in 1945 as the Keeper of the Department of Physics in charge of the Atomic Physics and Time Measurement sections, a post he held until his retirement in 1970. He prepared the many editions of the Science Museum Handbooks on Time Measurement, and since his retirement has catalogued the Scientific Instruments of the British Museum and the clock collection at Waddeson Manor. He is a founder-member and a Vice-President of the Antiquarian Horological Society, and has published many papers and given many lectures on sundials. We are very pleased to have him as our President.

HONORARY VICE-PRESIDENT: M. RENE R.-J. ROHR

M. Rohr is surely the doyen of diallists throughout the world. He was born in Strasbourg in 1905, studying there before joining the navy. He rose rapidly from Lieutenant to Captain au Long Cours and has written three books on his travels around the world. His experience in navigation brought him to an interest in gnomonics, on which he has written numerous articles, some of them quite profound, plus several books published in a dozen countries; whilst his main work on sundials, *Les Cadrans Solaires*, has been translated into German, English and Italian. One of his recent papers, translated by Charles Aked, in included in this *Bulletin*. We are honoured that he has joined us as our Vice-President.

ANDREW R. SOMERVILLE
CHAIRMAN

NEWS ITEMS

MEMBERSHIP LISTS

Membership of the Society is growing rapidly at present, when things have settled down a membership list will be printed. A list of special interests will be produced when most of the questionnaires have been returned and analysed. To facilitate the preparation of these lists, the information is being stored in a computer; under the Data Protection Act it is necessary to advise you of this procedure and request your agreement. The Society is not required to register under the Act, (Cost - £56), providing (a) all the membership is informed and subsequently agrees and (b) the information is not supplied to non-members. The information to be stored is member's name, address, telephone number and special interests as given in the questionnaire. Anyone wishing to be excluded from this register must inform the Chairman, otherwise agreement will be assumed. The Data Protection Office also advises me that if any member supplies a copy of the list supplied to him to any outside organisation, such as a commercial mailing firm, this may constitute theft of data!

INAUGURAL MEETING: 24 MARCH 1990

The Society's membership is scattered widely throughout the country, from the North of Scotland to Cornwall, and west to Ireland. There are also two members in the United States! It is obvious that many members will have difficulty in attending meetings wherever they may be held, and the best solution will be to move round the country year by year. The 'centre of gravity' of membership however, appears to be near Oxford, and this seems a most appropriate venue for our first conference as the city has so many sundials, including those in the Museum of the History of Science, which additionally has the Lewis Evans Collection of early sundial books. Excellent and reasonably priced accommodation and conference facilities are available in the colleges during vacations, since weekends are booked up many months in advance, a provisional booking has already been made at Exeter College (next door to the Museum) for Saturday 24th March 1990. The meeting will commence on Saturday morning and finish on Sunday afternoon, but those who wish to do so may stay in the College on Friday night and/or Sunday night as well to avoid travel difficulties. Details of the cost, the programme subjects and timetable remain to be settled, nevertheless put the date in your diary - now!

CONTINENTAL SUNDIAL STUDY GROUPS

FRANCE:
M. Robert Sagot
Société Astronomique de France, 3 Rue Beethoven, F 75106 PARIS.

EAST GERMANY:
Arnold Zenkert
Arbeitskreis Geschichte der Astronomie im Kulturbund der DDR, Sekition Gnomonik, Seestr. 17, Potsaam.

WEST GERMANY:
Dr.-Ing. Hugo Philipp
Deutsche Gessellschaft für Chronometrie, Arbeitskreis Sonnenuhren, Düsseldorfer Str. 73, D-4010 Hilden.

HUNGARY:
Lajos Bartha, Budapest II, Frankel Leó Str. 36, I/5 H-1023.

ITALY
Dr. Francesco Azzarita
Unione Astrofili Italani, Sezione Quadrante Solari, via G Fanelli 206/M, 70125 Bari.

NETHERLANDS:
F. J. de Vries, F D Rooseveltaan 96, 5625 PC Eindoven.

A useful series of articles on sundials was written by the late Noel C Ta'bois and is now continued by Christopher Daniel who, incidentally, gave the new Society a good launching platform by his article in *Antique Clocks* of May 1989. These articles are listed here for the convenience of those who possess runs of this magazine, the only one in Britain to feature sundials as a regular feature. The reference numbers shown are those in the bibliographical listing mentioned previously.

CLOCKS

Issued monthly from July 1978 until June 1988 when it became *Antique Clocks*. There was a pilot issue in October 1977 bur it contains nothing on sundials. The articles are given here in brief detail, the references being in volume, issue number, pages and date order.

132	1	1	20-21	6	1978:	"Ever Made a Sundial?" Martin Burgess
133	1	5	8-9	11	1978:	"Royal Sundial". Photograph sent by D. L. Thorne.
134	1	7	40	1	1979:	Illustration of oval watch signed Estienne Papon a Gien, sundial built into the gilt copper cover. A small compass is included to align the dial, c1590.
135	1	7	5	12	1979:	"Doctor's Sundial", illustrating an armillary sphere dial made by Dr. H. Auger.
136	1	7	6	1	1979:	"Saxon Church", illustration of dial at Duntisbourne Rouse Saxon Church.
137	1	7	41	1	1979:	Illustration of Universal Equatorial Dial by Johann Martin, Augsburg c1700.
138	1	11	62	5	1979:	"Clock Doctoring", mention of George Stephenson's sundial on his cottage at West Moor, Killingworth, drawn by his son Robert, erected 11 August 1814.
139	2	3	40-41	11	1979:	"The Sundials of Ripon", four sundials illustrated and described.
140	2	3	46-47	11	1979:	"How to make the sundial You've all Admired", by Dr. H. Auger.
141	2	3	55	11	1979:	"City Sundials", sundials on Charterhouse and 107 Cheapside, London.
142	2	6	33	12	1979:	"Sundials at Oxford", illustrating dials of All Souls and St Cross, Holywell.

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143	2	7	21-22	1	1980:	"Trio of DIY Sundials", by Dr. H. Auger.
144	3	1	58	7	1980:	Advertisement for creating horizontal sundial by Barry Head, long series of small panel advertisement insertions.
145	3	8	52	2	1981:	Increased size of previous advertisement.
146	3	11	19	5	1981:	"Sundials ...". Illustrates sundials by Peter Clare of Manchester dated 1809, another by Caygill of Askrigg, circa 1770.
147	4	9	16-19	3	1982:	"Tower of the Winds", by Charles K. Aked, Shows sundials on tower.
148	4	9	33	3	1982:	"Saxon Sundial". Illustrates the sundial at St Gregory's Minster, Yorkshire.
149	4	10	38-41	4	1982:	"Sundials of the City". Shows nine sundials, mostly in the Middle Temple.
150	5	2	5	7	1982:	Illustration of sundial on Stourton Church on the Okehampton-Travistock Road.
151	5	3	32	9	1982:	"Castle Bolton's mass sundial". Scathe dial in Wensleydale, Yorkshire.
152	5	7	11	1	1983:	"Brookbrae Dials". Details of sundials on St Margaret's Church, Westminster.
153	5	7	15-19	1	1983:	"Dialling through the Ages", by Dr. Harold Auger. With full page illustration of German Chalice Sundial in Science Museum, South Kensington.
154	5	7	23-26	1	1983:	"What makes then tick?". Illustrates a variety of sundials.
155	5	7	35-37	1	1983:	"The Corpus Christi Column", by David Boullin.
156	5	12	38-40	6	1983:	"The Great Observatories of Jai Singh", by Dr. Harold Auger.
157	6	6	26	12	1983:	Advertisement for 'Meristic' makers of sundials.
158	6	6	35-38	12	1983:	"Understanding Sundials", by Noel C. Ta'Bois.
159	6	6	57	12	1983:	Advertisement by Brookbrae of their Pillar Dial, reduced price offer.
160	6	9	7-8	3	1984:	"Dial with a difference". Not actually a sundial in spite of its appearance.
161	7	3	60	9	1984:	"Sundial maker". A sundial made by Thomas Grice in 1705 and illustrated.
162	7	12	14	6	1985:	18th century universal equinoctial dial signed John Bleuler, London, shown.
163	7	12	35-37	6	1985:	"The Observatory of Ulughbek", by Dr. Harold Auger.
164	8	1	29-37	7	1985:	"The art of scientific instruments", by Dr. D. J. Boullin.
165	8	1	49-53	7	1985:	"A treatise on public clocks", by Charles K. Aked.
166	8	3	23-28	9	1985:	"From the clock of Solomon to the canonical or scratch dial", by Jean G. Laviolette, translated from the French by Charles K. Aked.
167	8	3	34-41	9	1985:	"Significant sundials", by Noel C. Ta'Bois.
168	8	3	46-47	9	1985:	"Second-hand sundial", probably by Noel C. Ta'Bois.
169	8	4	24	10	1985:	"Sun time and clock time", by Noel C. Ta'Bois. 'Interface Reply'.
170	8	4	53	10	1985:	"The Art of Sundial Construction", by P.I. Drinkwater. Book review.
171	8	5	29	11	1985:	"Latitude and the sundial", by Noel C. Ta'Bois.
172	8	6	33	12	1985:	"Les Cadrans Solaires", by Jean-Mari Homet. Book review.
173	8	6	42	12	1985:	"Minor adjustments", by Noel C. Ta'Bois.
174	8	7	29	1	1986:	"The noon mark", by Noel C. Ta'Bois.
175	8	8	7	2	1986:	"Armillary sundial". Letter from I. Thorner.
176	8	8	32	2	1986:	"Gnomon or style?", by Noel C. Ta'Bois.
177	8	9	42	3	1986:	"The cross dial", by Noel C. Ta'Bois.
178	8	10	8	4	1986:	"Unusual sundials". Letter from M.C. Foster.
179	8	10	26	4	1986:	"Calculating the hour lines", by Noel C. Ta'Bois.
180	8	10	61	4	1986:	"Clocks and sundials". Letter form WRR, USA, about computer programme.
181	8	11	5-6	5	1986:	"Happy inclusion". Letter from Dan Plummer about dial computing programme.
182	8	11	7-8	5	1986:	Noon mark at Malta. Letter from Arthur W.J.G. Ord-Hume.
183	8	11	43	5	1986:	"Drawing the hour lines", by Noel C. Ta'Bois.
184	8	12	42	6	1986:	"Adjusting for longitude", by Noel C. Ta'Bois.
185	9	1	5	7	1986:	"Smallest sundial". Letter from Lindsey McFarlane, Greenwich Museum.
186	9	1	40	7	1986:	"The 15 minute design", by Noel C. Ta'Bois.
187	9	2	21-25	8	1986:	"The sundial of Bewcastle Cross", by Charles K. Aked.
188	9	2	48	8	1986:	"The Greenwich Meridian", by Noel C. Ta'Bois.
189	9	3	44	9	1986:	"The analemma", by Noel C. Ta'Bois.
190	9	4	55	10	1986:	"Mean-time dials", by Noel C. Ta'Bois.
191	9	5	25-30	11	1986:	"An almost-forgotten fragment", by Charles K. Aked.
192	9	5	36-37	11	1986:	"The observatory of Kublai Khan", by Dr. Harold Auger.
193	9	5	46	11	1986:	"Anglo-Saxon sundials", by Noel C. Ta'Bois.
194	9	6	33	12	1986:	Mention of universal equatorial dial by J.B. Dancer.
195	9	6	42	12	1986:	"Sundial oil", by Noel C. Ta'Bois.
196	9	6	50	12	1986:	*Sundials*, by Christopher St. J. H. Daniel. Book review by Noel C. Ta'Bois.

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197	9	7	14	1	1987:	Illustration of pillar dial.
198	9	7	42	1	1987:	"Searching for scratch dials", by Noel C. Ta'Bois.
199	9	8	6	2	1987:	"Interchanging latitudes". Letter from Brian M. Oliver, Australia.
200	9	8	25-29	2	1987:	"The clock of wisdom and the history of horology", by Charles K. Aked.
201	9	8	42	2	1987:	"Canonical and transitional scratch dials", by Noel C. Ta'Bois.
202	9	8	49-50	2	1987:	*Astrolabes, Astrolabe related devices,* by Anthony Turner. Book review.
203	9	8	50	2	1987:	*Midi Au Soleil,* by P. Bourge and Jean Fulcrand. Book review.
204	9	9	42	3	1987:	"Scientific scratch dials", by Noel C. Ta'Bois.
205	9	10	49	4	1987:	"A topiary sundial", by Noel C. Ta'Bois. (With photograph of Ta'Bois.)
206	9	11	44	5	1987:	"Equinoctial dials", by Noel C. Ta'Bois.
207	9	11	62	5	1987:	"Heliochronometer". Letter from GHP of Sheffield.
208	9	12	42	6	1987:	"Ring dials", by Noel C. Ta'Bois.
209	10	1	42	7	1987:	"Finger ring dials", by Noel C. Ta'Bois.
210	10	2	5	8	1987:	"Oliver dial". Letter from H. Williams, Nuneaton.
211	10	2	40	8	1987:	"Pillar dials", by Noel C. Ta'Bois.
212	10	3	44	9	1987:	"Disc dials", by Noel C. Ta'Bois.
213	10	4	46	10	1987:	"The Entrada Court sundial", by Noel C. Ta'Bois.
214	10	5	28-9	11	1987:	"Striking the canonical hours", by Ramond Lamont-Brown.
215	10	5	41	11	1987:	"An executive toy", by Noel C. Ta'Bois.
216	10	5	50	11	1987:	Illustration of St. Gregory's Minister, Yorkshire.
217	10	6	14-8	12	1987:	"A straightforward task?", by D. A. Bateman.
218	10	6	22	12	1987:	Illustrations of Henry Hindley brass sundial.
219	10	6	37-41	12	1987:	"Whilst time stood still ... centuries passed", by Charles K. Aked.
220	10	6	42	12	1987:	"Hours and hours", by Noel C. Ta'Bois.
221	10	6	59	12	1987:	"Sundial History". Letter from B. L. Worcestshire.
222	10	7	5	1	1988:	"A 'down-under' sundial". Letter from S. Allison, Victoria, Australia.
223	10	7	41	1	1988:	"Sundials for sale", by Noel C. Ta'Bois.
224	10	8	10-11	2	1988:	"The instruments of science". Two book reviews.
225	10	8	26-27	2	1988:	"Scientific instruments". Sale including dials, one illustrated in colour.
226	10	8	36	2	1988:	"The Pilkington & Gibbs heliochronometer", by Noel C. Ta'Bois.
227	10	9	35	3	1988:	Notice of article on stained glass sundials.
228	10	9	47	3	1988:	"A puzzling dial", by Noel C. Ta'Bois.
229	10	10	30-7	4	1988:	"Sundials in stained-glass", by Christopher St J.-H. Daniel.
230	10	10	42	4	1988:	"Keeping records", by Noel C. Ta'Bois.
231	10	11	46	5	1988:	"A quality biscuit tin", by Noel C. Ta'Bois.

ANTIQUE CLOCKS

Published from June 1988, previously under the title of *Clocks*. The entries listed below are in Volume, Issue Number, Page Number and Date order. See the entries under CLOCKS for previous references from July 1978, ten volumes less one issue completing the run.

25	11	1	38	7	1988:	Obituary of Noel C. Ta'Bois who died 7th March 1988.
26	11	2	13-4	8	1988:	"New author for 'The sundial page' ".
27	11	2	44-6	8	1988:	"Golden surplus at The Time Museum". Several instruments shown in colour.
28	11	3	52	9	1988:	"Quaint old-fashioned ornaments", by Christopher Daniel. Shows three dials.
29	11	5	39	11	1988:	"Of sundials and status", by Christopher Daniel.
30	11	6	38	11	1988:	"The good, the bad and the ugly", by Christopher Daniel.
31	11	7	7	12	1988:	"Swaledale dials", photographs from N. Andrews, London.
32	11	7	7	12	1988:	"Reconstructing pillar dial", letter from David Bierda, London.
33	11	7	25-6	12	1988:	"Arsenious discovery breaks the record", astrolabe sold for £385.000.
34	11	7	33	12	1988:	"The good, the bad and the ugly: the bad", by Christopher Daniel.
35	11	7	40	12	1988:	"Attractive artefacts", Review of *The Ivory Sundials of Nuremberg 1500-1700.*
36	11	8	11	1	1988:	Sundial on church at East Bergholt.
37	11	8	46	1	1989:	"The ring of truth", by Christopher Daniel.
38	11	9	5	2	1989:	"Complex dial". Letter from L.P. Thomas, Hants.
39	11	9	44	2	1989:	"Anchors aweigh!", by Christopher Daniel.
40	11	10	12	3	1989:	"Dramatic fall in ME clocks". Illustrates example of phoeboscope.
41	11	10	32-7	3	1989:	"An unusual collection", by William Drinkwater. Will's cigarette cards showing examples of sundials.

ANTIQUE CLOCKS

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42	11	10	6	3	1989:	"The giant of Milton Keynes", by Christopher Daniel.
43	11	11	37	4	1989:	"A celestial dial", by Christopher Daniel.
44	11	12	42	5	1989:	"Starting a Society", by Christopher Daniel.

* * * * * * * * * * * *

The study of this long series of articles will give an excellent grounding in the subject of dialling without the difficulties encountered by a reader with the usual dialling works. The older works require a great deal of study to arrive at a complete understanding because of the archaic mode of presentation of the information, in this it is no different to reading older works on other subjects such as mathematics.

There are, of course, some excellent articles on sundials in the journals of the French equivalents of the Antiquarian Horological Society, namely the Association Nationale des Collectionneurs et Amateurs d'Horlogerie Ancienne [National Association of Collectors and Amateurs of Antiquarian Horology], and the Association Française des Amateurs d'Horlogerie Ancienne [French Association of Antiquarian Horology].

LAMBERT'S CIRCLES

RENÉ R.-J. ROHR, STRASBOURG

In 1701 the mathematician Antoine Parent, in a note sent to the Academy of Sciences in Paris, demonstrated the possibility of constructing a universal instrument for the indication of time on the basis of an analemmatic sundial. In actual fact, the latter did not merit this epithet, partly because its use in the northern zones was rendered impossible by the dimensions taken by its parts. In spite of an unsophisticated conception, it is very probable that the instrument was never constructed, neither did it interest many people until recently when in unexpected and very unusual circumstances, it at last had its hour of glory after not having found it in two and a half centuries, except for a single author, who cited in under the name of Universal Analemmatic Sundial of Antoine Parent[1].

In the following text, Cartesian coordinates are used to refer to the axes of the ellipses.

It will be recalled that in such a horizontal dial the gnomon is vertical and must be moved on a scale with dates placed on one side or the other of the centre 0 on the minor axis of the ellipse by an amount equal to R tan D cos φ towards the north or south; R being the length of the semi-major axis, φ the latitude of the place, and D the declination of the Sun, which has the maximum value of ± 23.5°.

Parent's problem was how to combine an assembly of ellipses in a unique ensemble to serve for the different latitudes. In order to achieve this, he first simplified the scale, by replacing the partial product R cos φ in the preceding formula by the constant C, which is equal to the distance of each of the foci F and F' from the centre O (Figs. 1 & 3). Thus the two foci and the dates scale remain the same for all the ellipses, the scale, now being independent of φ, having the value of C tan D, and the only remaining variables are respectively C / cos φ for the major axis and C tan φ for the minor axis.

In these conditions the two axes diminish in length as the latitudes decrease and terminate at the equator by becoming respectively equal to 2C and zero (since φ then = 0°); the whole ellipse reducing ultimately to the straight line FF' on the major axis. Inversely, at increasing latitudes, the ellipses become greater and greater, finally to extend to infinity at $\varphi = 90°$ at the two poles. For practical reasons, therefore it is necessary to limit the zones employed to judiciously calculated latitudes. In any case it is not advisable to trace the ellipses for each degree, but only each second or third, as may be seen in Fig. 1; too many lines would obscure the observations and it is easy to interpolate between the ellipses as shown.

The equation of these ellipses is:

$$x^2 + y^2 / \sin^2 \varphi = C^2 / \cos^2 \varphi = R^2 \qquad (I)$$

The construction of the horary points of the ellipses can, as usual be made on the basis of the division into 24 hours of the auxiliary circles with centre O and of radii R given by the term C / cos φ. The equation of the intersecting points of the ellipses with the hour shadow lines on the day of the equinox can also be derived by rearrangement of the equation:

$$x \sin \varphi / y = \tan t$$

where t in degrees = 15T and T denotes the time in hours. The elimination of φ in these two equations leads to:

$$x^2 / \sin^2 t - y^2 / \cos^2 t = C^2 \qquad (II)$$

which is the equation for a group of hyperbolas with foci at F and F' as is clearly shown in Fig. 1.

It has already been stated that this dial met with little interest and was not appreciated. The orientation could be achieved in conjunction with an ordinary horizontal sundial, which would only have been functional for one latitude. Setting by the magnetic compass was not suitable because of variations in the direction of the earth's magnetic field.

Finally, because the Capucin of Regiomantus was infinitely less cumbrous and more universally utilisable for those who travelled over long distances, the dial proposed by Parent was condemned to oblivion.

There it remained up to the year 1942 . . . .

In this year, the American army disembarked in North Africa, and its General Staff had foreseen the need to furnish the armoured tanks and trucks destined for service

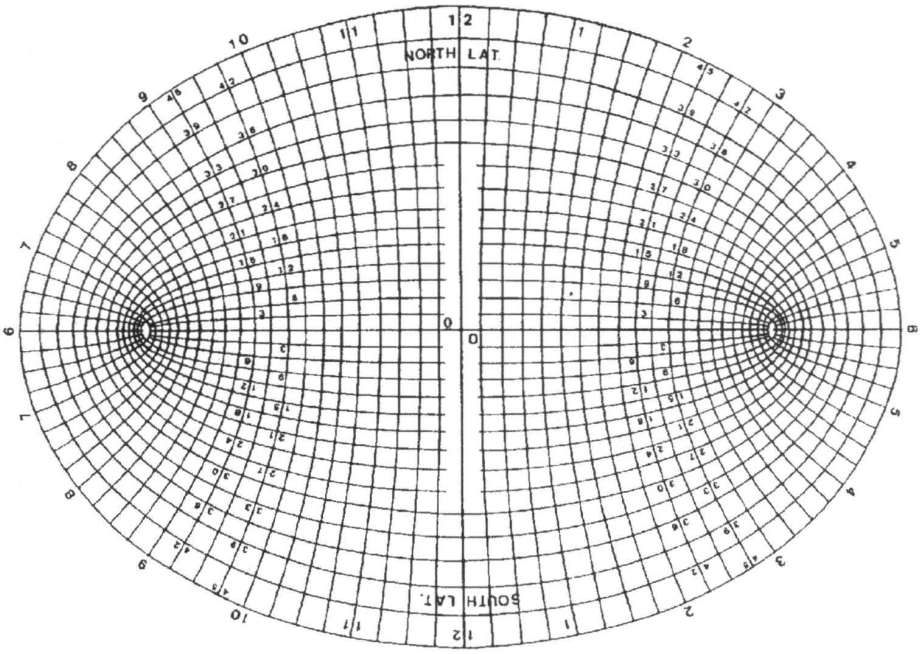

FIGURE 1

in the desert regions with a means of orientation to allow them to travel without directional references such as that obtained by ships at sea with the help of their compasses. Tentative attempts to use magnetic compasses had been made which proved abortive, leaving the choice to solar observations, and at this point someone thought of Parent's universal dial.

In effect, once orientated, this dial provides the true local time. Inversely, if a watch is set to this local time and the dial is turned, whilst held horizontally, until the shadow of the gnomon shows this time on the ellipse corresponding to the latitude of the place, the minor axis of the ellipses indicates the direction of the meridian and the sundial thus becomes a sun compass and navigational instrument, which, it is true to say, no one had ever thought of as such previously[2]. The idea being adopted, the dial (Fig. 1) was produced with the ellipses for each three degrees of latitude from 0° to 45°. A movable index allowed the driver to maintain the shadow on the present hour, another marked the direction to follow. In the figure one can see the slot provided for adjustment of the gnomon, the two foci which are common to all the ellipses, and the hyperbolic hour curves with the orthogonal intersections of the two families of curves.[3] The dimensions of the exterior ellipses are 127 x 180mm.

But there exists in this ensemble of analemmatic dials a peculiarity apparently completely lost to view by authors on gnomonics which merits being recalled, indeed signalled as to its application to Parent's dial . . .

Few travellers when contemplating the old stones disposed in an ellipse in the square in front of the celebrated church of Brou in the Ain, imagine the number and nature of the geometric surprises which they conceal[4]. And even to the learned, who believed they had exhausted those hidden secrets, it possibly occurred fortuitously when reading the yellowed pages of some old book, to come across an unusual and unexpected property of this memorable type of dial.

A few years ago, in an Alpine village of the Isère where he had retired, there died an old engineer friend of mine, whose letters have been of such an encyclopaedic interest, that their whole collection, now bound, constitutes one of the treasures of my library. He was in the habit of reading Latin authors and exploring all kinds of books of past centuries not now easily accessible. One day, one such letter contained the sketch of a geometric design entitled "Universal Analemmatic sundial of Antoine Parent"; [reproduced here from calculated measurements provided by a computer (Fig 2)]. It represents a device of Parent's conception, but more importantly contains parts of two circles symmetrically placed about the major axis of the ellipses which pass through the two foci and the position of the foot of the gnomon at the two solstices.

The south part of the circle carries an inscription "Lambert's Circle for D = 23.5°N, Parent himself must have had no knowledge of these circles, of which he made no mention. My friend never indicated any other source of information. In his letter he said that for a given declination of the sun, their intersections with the ellipses of different latitudes marked the points, where the true local time of the rising and setting of the sun would be indicated by the shadow of the gnomon. Without giving me the proof, which he had not pursued, he added that it could probably be found by analytical means[5].

Jean Henri Lambert was born in 1728 at Mulhouse in Alsace. He was the eldest of ten children of a tailor living in conditions neighbouring on poverty. His skill in figures brought him, whilst an adolescent, a job as a book-keeper in a neighbouring forge, and it was there that quite by chance he discovered his aptitude for mathematics. He was self-taught, and working by day and by night, he succeeded first in Switzerland, then in Germany, to be employed as a private tutor and gradually developing his genius. Later in life he became noted for his publications in mathematics, physics, astronomy and philosophy. It was not long before he became to be considered one of the most remarkable analysts of his day. In 1765, Frederick II, then the Emperor of Prussia, made him come to Berlin, where he was soon one of the most active members of the new Academy of Sciences, and where he died in 1777 after having been the particular protegee of the king for many years.

"One does not easily find a science", he said in one of

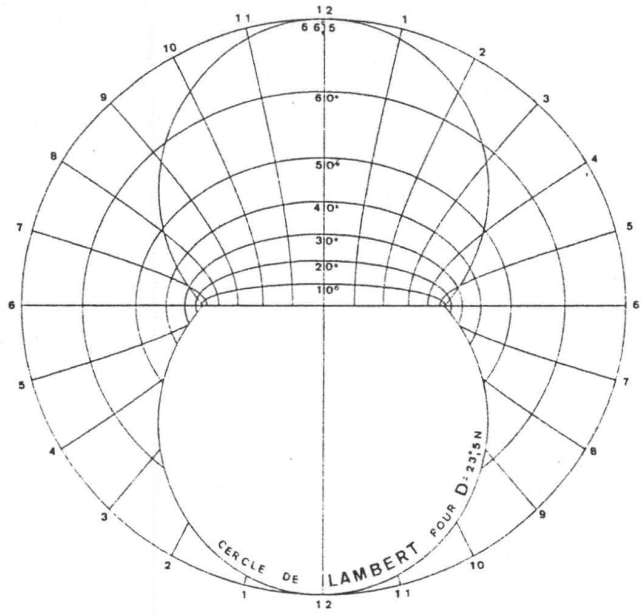

FIGURE 2

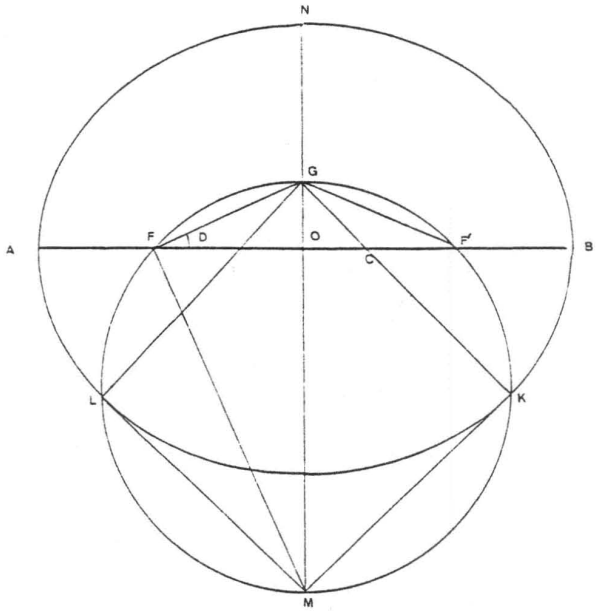

FIGURE 3

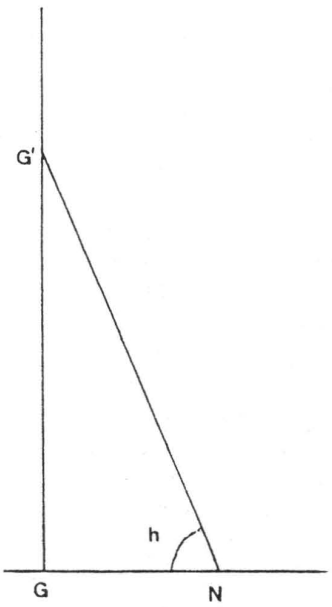

FIGURE 4

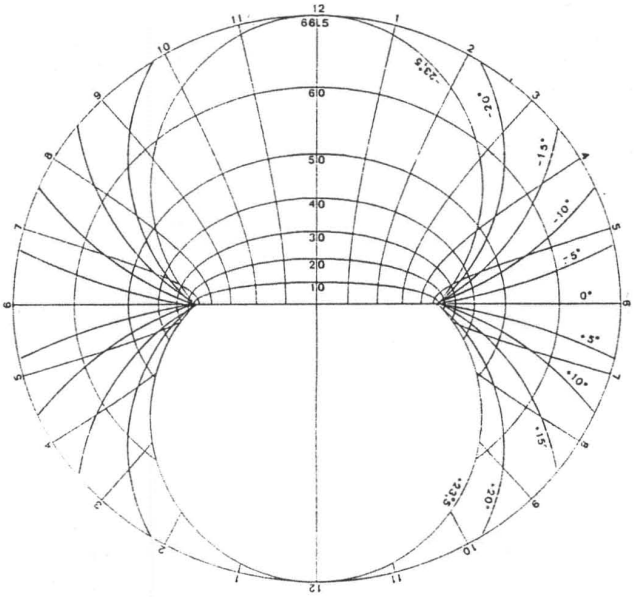

FIGURE 5

his mathematical works[6], "which presents so many forms and can be applied in so many different ways as that of gnomonics".

In this connection the reader would do well to recall the very special analemmatic dial with a circular scale in which the gnomon is inclined towards the north or towards the south of the vertical, which invention is generally attributed to Lambert, but equally to the Englishman Foster,[7] each of whom had worked out the solution in his own way. In connection with the circle bearing his name,[8] the demonstration of its properties, as presented by Lambert in the above-mentioned work, is of such conciseness that it not readily understood by the ordinary reader. The reader will therefore permit me to replace it by the simpler treatment as given below:

Suppose (Fig 3) that AB is the major axis of an analemmatic dial, O is the centre and ON is the north semi-minor axis. F and F' are the foci and G the location of the gnomon. The length C, equal to OF and to OF', has the value R cos φ. The points, F, G, F', and M are on the circle of Lambert. The coordinates of the points G, F, and F' in the system of the axes of the ellipses being known, it is easy to deduce the equation of the circle,[9] which is:

$$X^2 + Y^2 - 2CY / \tan 2D - C^2 = 0 \qquad \text{(III)}$$

Giving the value of O to x, the diameter of the circle can be found, which is 2C / sin 2D.

The lines GL and GK are the shadow lines of the gnomon at the moment of the rising and setting of the sun. It is known, as Lambert knew, that for a given declination of the sun, the small variation in this parameter in the course of a day being neglected, the length of the part of the sun's rays falling between the gnomon and the arc of the ellipse is constant.[10] Consequently if, as is the case of the case for the points L and K, the sun is at the horizon, the aforesaid segment of the solar rays will be in the plane of the dial, its projection in this plane attains its maximum length and its contact with the elliptical arc is normal, that is to say, orthogonal. Consequently the triangles GLM and GKM are right-angled at L and K respectively but the lengths of GL and GK are known: they are equal to the segment of the sun's ray lying between the gnomon and the arc of the ellipse at the moment of the culmination of the sun, where its angular altitude (height h) becomes equal to 90° - φ + D (Fig 4). If N is the northern extremity of the minor axis, then GN is equal to ON - OG, that is to say equal to: R sin φ - C tan D, or:

GM = C (tan φ - tan D) and the length of the chords GL and GK will be:

$$\frac{C (\tan \varphi - \tan D)}{\sin (\varphi - D)}$$ which simplifies to C / cos φ cos D

On the other side the sun's azimuth is given by the formula:

sin D = sin φ sin h + cos φ, cos h, cos Az

h being the height of Az the azimuth, which for the sun at the horizon (h = O) gives: cos Az = sin D / cos φ

In the triangle LGM (this is similar to the triangle KGM)

GM = GL / cos Az or

GM = C / (cos φ / cos D) x (cos φ / sin D)

GM = 2 C / sin 2 D

which is exactly the value of the diameter obtained from Lambert's circle. The summits of all the right angles whose sides pass the points G and M are therefore on this circle. And these summits mark the times of the rising and setting of the sun. In the design shown here the point M is placed on the polar circle. Only between this circle and the pole can there be days and nights of 24 hours duration according to the season.

In the designs of Figs 2 and 5, Lambert's circle appears for residents in our part of the world also in the northern part of the dial. The shadow there marks the time of the rising and setting of the sun at the time when the declination is opposite in sign to the latitude. Within the limits of the greatest ellipse, which is that of the latitude of the polar circle, the second of the designs contains the parts of Lambert's circle for declinations of 5, 10, 15 and 20 degrees. It can be seen that as these diminish, their radii increase very rapidly and for the days of the equinoxes (D = 0), become infinite, the circle being then reduced to a line which coincides with the major axis of the ellipses.[11]

This diagram represents, for the zones between the polar circles, the scheme for a nomogram allowing the times of the rising and setting of the sun on every day, and at every place, to be seen at a single glance.

There is no doubt that Lambert's circle possesses something of remarkable singularity: heavenly bodies turning their way in the endless spaces of the Universe give rise to the drawing of a sophisticated design, and these momentary events are reflected in the form of a circle . . .

But what about the use of such a design?

The question could similarly have been asked on the subject of Parent's universal dial discussed previously, which found an unexpected use centuries after the death of its deviser. Here, some world-wide planning organisation might be interested. The friends of sundials at all events might like it, but those too who research mathematical curiosities and again and above all those who wish to clarify the question of knowing whether there are other kinds of surprises the analemmatic dial may hold in store, for some future day . . .

* * * * * *

NOTE BY TRANSLATOR

The preceding text is not an exact translation of the original written by M. René R.-J. Rohr because some parts have no exact counterparts in English, and in addition the mathematical explanations have been given additional detail to make these more understandable to those who lack mathematical expertise. The extra clarification is unnecessary for the mathematician, but the concepts are not easy to grasp without careful thought.

ACKNOWLEDGEMENTS

Checking of the mathematical equations and further simplifications were carried out by Mr James R A Aked MA BA (Honours) Oxford.

The translator would like to express his admiration for the analytical powers of M Rohr in clarifying these obscure applications of dialling which were covered with centuries of dust before he began his study of them.

THE SUNDIAL AT MADELEY COURT, SHROPSHIRE

ANDREW R. SOMERVILLE

Madeley Court, near Ironbridge in Shropshire, is a 16th century house which is now being restored with help from English Heritage for use as a hotel. A field archaeology unit from Birmingham University has been working there and has charted remains of much earlier monastic buildings. In the walled garden there is a unique sundial which has been illustrated in many books, eg. Mrs Gatty's "Book of Sundials", 1900 (Fig 1), but there appears to be no published research on either its uses or history. Thanks to an invitation by the archaeologist Ms Cameron Moffett and with the help of the mason working on restoration, Mr Mark Evans (now a member of our Society!), I have been able to make a close examination of it.

This sundial is a cube of stone, of about 4ft side (1195 by 1190 by 1180mm deep) topped by a hemispherical dome 3ft in diameter by 18in high (920 by 460mm) which is cut from a separate piece of stone and cemented to the block. There is a hole on top of the dome which would have held a vertical pin gnomon. The block is oriented true north-south. The north face is blank: no trace of inscription or carving could be seen. The top face and dome are also devoid of inscription. The east, west and south faces have hemispherical central hollows 26in diameter by 12.5in deep (660 by 320mm), surrounded by other hollows: the south side has four smaller hemispheres at the corners, 13.5in (340) diameter, though some of the corners, together with parts of these hollows, have been broken off. These hemispheres, together with the centre hollow, have two fixing holes, one central and the other above it, which would have been used to mount triangular gnomons. This side also has escutcheons hollowed in the centre of each edge, two top and bottom and one on each side. These have a flat base and no fixing holes and probably carried painted coats-of-arms. The central hollows on the east and west faces have holes on their edges, diametrically opposed at an angle of 52-53°, in which bar gnomons would have been fixed at the angle of the latitude (52°40′ for Madeley Court). They also have central holes which could have been used for pin gnomons to show the altitude and azimuth of the sun. These sides have other hollows round their edges in a variety of shades: circles, triangles, squares or hemi-cylinders with triangular or semi-circular decoration on their sides. Many of these also have fixing holes for the appropriate bar gnomons. The block stands on pillars 15in (380mm) high; the drawing in Gatty (1oc.cit.) shows these resting on a raised circular base, but this is now totally overgrown. The underside of the block is badly cracked and has been clamped at some time with iron bands set in lead which have now rusted away. Rescue work is urgently needed.

There are no lines, numbers or inscriptions visible on the dial, except that the central hollow on the south side has some superficial scratches which assemble a network of declination and hour lines, but as these are on the upper part of the hemisphere where they could not have been functional, it is likely that they are recent graffiti.

This sundial appears to be the only one of its kind still existing; even in Scotland where large stone dials with numerous hollows are more common than in any other European country (Somerville, 1987) there is nothing quite like it. It is assumed to be contemporary either with the present house (built from the middle of the 16th century, although an earlier monastic house existed on the site), or with the walled garden, believed to have been enclosed about 1620-30. No documents seem to have survived from these periods and these periods and the earliest known reference to the dial is in a 19th century Archaeological Journal (Blunt, 1854), which has only a factual description. The only other English free-standing stone dials which can be dated to the 16th century with reasonable certainly are at Elmley Castle in Worcestershire, Marrington Hall in Shorpshire and Iron Acton, near Bristol, but these are all completely different in style, from each other as well as from the Madeley Court dial. The art of making such multiple sundials is usually thought to have been brought to England about 1517 by the German mathematician Nicolaus Kratzer, who became 'astronomer and deviser of the King's horologes' to Henry VIII in 1519 (North, 1978). He is known to have made a number of stone multiple dials, none of which now survives, with the possible exception of the cube dial found at Iron Acton in 1985 by Sir George White (1986, 1987), which carries the date 1520 and the initials 'NK'. The earliest printed books on sundials, such as that of Oronce Finé in 1532, have diagrams of multiple dials with domed tops like that at Madeley Court (Fig 2); the tip of vertical pin gnomon would have cast its shadow on a set of declination lines round the north side of the dome, enabling the date as well as the time to be read. Later 16th and 17th-century books give details of how to set out concave and convex dials though, as Kratzer himself incorporated hollows in some of his dials, the methods were clearly well known before they found their way into print.

In *The History of the King's Works* (HMSO, 1975, 1982), there are numerous references taken from the Royal accounts which show the existence of such large stone dials in the late 16th and early 17th centuries. Thus, at Hampton Court in 1629-30 Richard Chamberlayne, mason, erected a dial which seems to have been 3ft (900mm) high and wide with a concave on top 28in (700mm) in diameter and eight other small concaves on the sides and in 1631-2 another was built by John Marr (Mar or Mair), mathematician, which had 'nine lardge Hemispherical Dyalles and eight large plane Dyalls upon a great stone of Portland cut into viij Canttes wch demonstrates divers and sundry conclusions to bee performed theyby wth the Northern Constellations in the great dyall and twoe mapps in other twoe of them with divers Ornams . . .'. St James Palace also had a similar dial made by Marr in 1629-30. All of these were elaborately painted and gilded and protected by wooden 'houses', presumably when the Court was not in residence. Even larger dials were made for walls, one at Oatlands House, Surrey, being 24ft (7.2m) in diameter!

The most complete description which has come down to us is of the great dial in the Privy Garden at Whitehall, built in the dial he describes has a remarkable resemblance to the Madeley Court dial. It was about the same size: 'The base of it is a square of somewhat more than four foote and halfe; the height three foote and 3/4' and it had numerous concave including a large one on the top instead of a dome, though it had plane dials as well and a number of ready reckoners to give, for example, the day of the week for

festivals and the time of southing of the moon, from which could be obtained the correction for using the dial at night by moon-shadow (only possible for a few days around full moon!) and the time of high tide at any port for which the 'port establishment' was known (see Somerville, 1986). The dials themselves could give not only the hour, in any of the common systems then in use: equal hours from midday, sunrise or sunset (Babylonian or Italian hours) and the old unequal hours by which the daylight was divided into 12 'hours' which varied in length according to the season, but also the time of sunrise and sunset, the length of the day, the date or sign of the zodiac which the sun was entering, the altitude and azimuth of the sun, the local time of noon in other countries etc. There was also included a dial to show 'the proportion of shadows to their bodies' which could be used for calculating heights from the length of the shadow cast. Many of these dials could be used in the 'reverse' sense ie. the date when the sun rose at a certain time or at a certain azimuth could be found. The Madeley Court dial is not as elaborate as this but it would no doubt have shown many of the same things. Gunter also gives details of how his dial was painted: black hour lines, red declination lines, blue for Italian hours and yellow for Babylonian, green for unequal or planetary hours etc. The background between the declination lines was to be white and outside these lines, blue.

The Madeley Court dial would certainly have been painted in a similar fashion. Many dials of the 16th and 17th century show no trace of incised lines today, even though they may be made of a hard stone which has weathered well, and this is no doubt because the lines and numbers were painted; numerous contemporary descriptions exist of the methods to be used.

The dial has sometimes been referred to as a 'planetarium' and Gatty (1900) says 'the position of the moon in relation to the plantes can also be ascertained' and another account claims that it has a series of holes which pass through the block and were used to determine the positions of the planets and the moon. The origin of this story has not been traced, but it smacks of the sort of legends which grow up round these complex dials whose use is not properly understood - similar tales are told in connection with Scottish multiple dials. There are no signs of holes passing through the block at present; the only holes are those which are clearly intended for mounting gnomons. To sight the moon and the planets would require some sort of movable vane or volvelles, of which again there are no traces. A possible source is suggested by the description of the Hampton Court dial made by John Marr (1631) which seems to have been similar in function, if not in form, to the Whitehall dial: '. . . in the great concave (betweene the Tropiques of Cancer and the Artique circle are drawne and painted these constellations of the starres following vizt Orsa Major, Orsa minor, Cepheus, Cassiopeia Draco and some parte of the Perseus wch constellations are adorned with all the principall fixed starrs that doe belonge to each of them, sett accordinge to theire due declination and right ascension. Their right ascension in howers is known by the forsaid nombers next the meetinge of the principall meridians with the arctique circle and the odd minutes of time by an arithmeticall nomber annexed to each of them. Theire use is to knowe ye hower of the night by the starrs'. And an earlier dial (Burghley, 1576) was said to have been used 'to knowe what planet raigneth and ruleth according to the antique observation of the Chaldayans', presumably by the use of tables and charts. The presence of such star maps and tables could easily have given rise to the 'planetarium' stories.

Gunter says of the Whitehall dial 'The stone whereon the Dials are described, is of the same length, bredth, and depth, with that which stood in the same place before . . . it is also wrought with the like Plaines and Concaves as the former, and so necessarily, the like lines to shewe the houre of the day. But the rest of the lines are much different . . .' This earlier dial was repainted by George Gower in 1595-6 (*The History of the King's Works* vol IV p318) and it is mentioned by travellers in 1584 and 1620. It may even have been designed by Kratzer himself (see Strong, 1979, 35, 38). As it is so similar in form to the Madeley Court dial, it is evident that, as far as the scientific part is concerned, the latter could have been made at any time from 1520 onwards, but the decorative use of small dials in triangular and other geometrical forms (not mentioned in connection with the Royal dials) recalls the symbolism of early Jacobean gardens. Although the sculpture provides insufficient evidence to date the dial precisely, its four-square solidity has a 'feel' which is more Jacobean than Elizabethan and such evidence as exists from the accounts quoted in *The History of the King's Works* suggests that the fashion for such large stone dials lasted perhaps from 1570 to the Civil War: there is no mention of them either before or after that period.

These multiple dials would have been less practical as timekeepers than the large wall-mounted dials commonly used for regulating clocks at this period; no doubt they had their uses as decoration and as 'conversation', but it is likely that they also had a deeper significance, given the intellectual atmosphere of the time which made great use of symbols, often associated with magical practices. Symbolism may have been important in relation to the Scottish dials (Somerville 1987), where there could have been local factors at work; whether the same argument apply in England is less certain because there are so few dials of this sort surviving here, but Strong (loc.cit., 123) says of the Jacobean garden at Wilton made by the Earl of Pembroke between 1601 and 1620 that it was described by a contemporary as geometrical and emblematic with references to circles, triangles, quadrangles, orbs and ovals in which it was possible to read 'both divine and moral remembrances'. Circles, triangles and quadrangles are of course the shapes found on the Madeley Court dial and were also associated with the 'Art' of Raymond Lull which become a cult with philosophers in the 16th and 17th centuries (Yates, 1966). 'Between 1600 and 1620 there were evidently an immense fashion for the large scale geometric garden, often laid out with deliberate symbolic intent' (Strong, loc.cit. 124). Could the garden at Madeley Court have been one of these, with the sundial as centre-piece? This would place it as perhaps earlier than the supposed dated of the garden gateway, believed to be 1620-30, but by 1630 the fashion had changed in favour of water gardens and the garden at Wilton was re-modelled in 1632-35 by the famous hydraulic engineer Salomon de Caus, with statues by Nicholas Stone. In any case the dial is unlikely to be later than 1640, because the fortunes of the Brooke family declined during the Civil War and their building programme came to an end.

Stone (1586-1647) took down the earlier Whitehall dial in 1622 and rebuilt it to Gunter's design (though according to Stone's great nephew Charles Stoakes 'the famous Mr

Marr erected the Lines' (Walpole Soc., 1919). He also noted at the same time, about1669, that 'the fine Diall now stands Ruin'd in the Privy Garden at Whitehall'). He became master mason to Charles I in 1632 and was a sculptor noted for statues and monumental effigies, of which examples exist all over the country today (Fryer, 1912). He left a notebook and account book (Walpole Soc., 1919) in which he gives details of his work year by year, together with the amounts which he was paid. He received £46 for the Whitehall dial in 1622 and in the same year he made two others, one for 'my Lord Brook in Holborn' (probably Fulke Greville of Warwick) for which he was paid only £8 10s so it was presumably less elaborate. He does not mention having worked in Shropshire, apart from a tomb effigy at Acton Burnell, but it is tempting to think that the Madeley Court sundial may have been sculpted, if not by him, at least by one of his pupils, who copied the Whitehall dial with his own modifications.

MADELEY COURT

FIGURE 1: S & E Faces

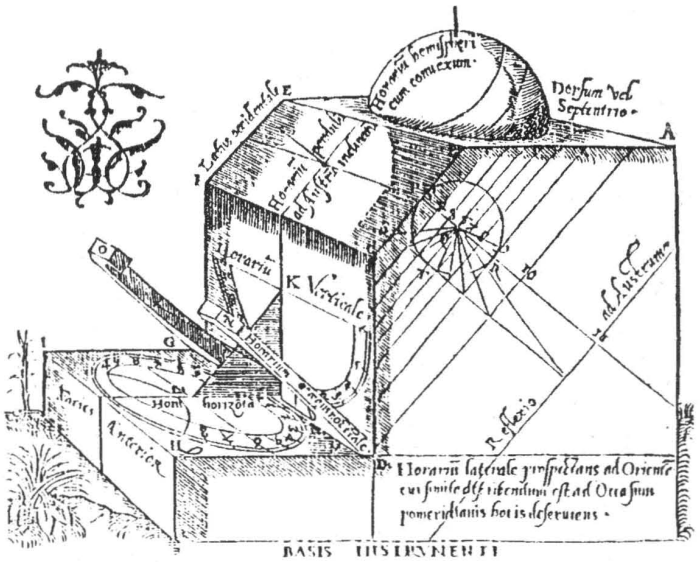

Illustration of a polyhedral dial, from *Oronce Finé*, 1560

FIGURE 2

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A version of this article forms part of a report to the Historic Buildings and Monuments Commission and I am grateful to them for permission to reprint it here.

"SUN TIME"

PETER I. DRINKWATER

EDITOR'S NOTE

Mr. Drinkwater is the author of the very successful book *The Art of Sundial Construction*. A measure of his competence is that Mr Christopher St J H Daniel wrote the foreword and calls it a "delightful book". Mr Drinkwater has some unusual views on life, and when asked to make a contribution to the *Bulletin,* expressed himself as follows:

A manufacturer of simple, commercially produced, metal sundials, ornaments many of his products with the following text:

"I TELL SUN TIME".

A truism surely? Not so; for so many Sundials produced today are deliberately contrived to do something other: to mimic the clock in proclaiming, by various ingenious devices, the Greenwich Mean Time, or B.S.T. set forth on the Radio, or the telephone 'Speaking Clock'. (I have no acquaintance with anything more sophisticated than that in this field!)

The expectation that the proper function of the Sundial is to do just that, and that if it does not then it fails, is responsible for such expressed sentiments as "I am a sundial and make a botch/ of what is done much better by a watch", which seems always "good for a laugh" whenever the subject is touched upon in polite trivial conversation. What, in this context can we make of such 'noble' sentiments as "True as the Dial is to the Sun/Although it be not shin'd upon" or the actual Mottoe - "It is impossible for me to Lie"? Do we make the rejoinder of Pilate - "What is Truth?"; or do we find ourselves actively giving serious consideration to that very question?

The writer of this article spent many years working within the illogical confines of "G.M.T." and "B.S.T.", frequently finding himself stranded by the failure of public transport in winter through the demands of a job based upon a time system which insists that it is still Afternoon long after the Sun has insisted, by its departure, that it is night, and long past the time for beginning to plod one's weary way homeward. Now self-employed, and with these miseries no more than an evil memory, he rejoices not only in the freedom to pack up and go home at sunset in winter, but also to commence working, frequently outside, at Sun rise in Summer, and to carry on at a steady unforced pace, with frequent 'pastoral' pauses, until its going down in the Evening.

To spend a day thus, as I have just done, whilst (in this instance) restoring an inscription over the Doorway of a Church, as the Shadows trace the Sun's progress, and the unconcerned Swallows feed their young in the eaves above, is to experience reality in a manner which is almost surreal. To call it Aesthetic, or Spiritual, or Mystical; Hermetic, or Pantheistic; would be what it appears to be, to be a mere search for an effective expression: it is all of these things and more. It is to be part of that Higher Reality of which the Traditional Sundial is a statement in miniature: the Map, or Emblem of the Universe. It is enough, it is Adequate, it is Utilitous. In the words of yet another poet:

' "Beauty is Truth, Truth Beauty", - that is all ye know on Earth, and all ye need to know'.

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No doubt we shall be meeting Mr Drinkwater again, he sent a colour print of himself coyly hiding behind a sundial of his own design and creation, and a hippeastrum. Alas, our limited resources do not allow its reproduction.

SUNDIAL BOOKS

Sundials, dialling, gnomonics, shadow clocks, or similar names comprise a subject which is so specialised that only the recent awakening of interest worldwide has allowed new sundial books to appear. Contrary to the view of most enthusiasts: publishers and booksellers are in business to make a living, if they can deal in some subject which interests them personally, so much the better, they cannot afford to be altruistic disseminators of true knowledge for its own sake. Small societies such as ours depend heavily upon a few dedicated enthusiasts whose reward is merely that of sharing the interest and knowledge in their chosen sphere by publishing material which is not commercially viable and would otherwise never see the light of day in the ordinary course of events. Many would-be authors do not realise that the writing of a book is only the first step along the road, the real difficulty, especially in the financial conditions of today, is that of finding a publisher. Many of the horological books of recent years have been financially underpinned by the authors with sufficient faith in their work to hope that ultimately they might recover the initial outlay, any profit made would be a bonus.

For the majority of us, the study of sundials will only be through the literature of the subject. The English reader is not as well-off as his Continental counterpart in this respect. Many sundial books have been published on the Continent in recent years where several sundial societies have been founded. Except for the colourfully illustrated works, sundial books are not commonly found in bookshops, fortunately there are specialist booksellers who do stock both modern and antiquarian dialling literature. The formation of a dialling library will be an expensive matter if the older works are collected, in fact the acquisition of these, if the pocket is big enough, is an ultra-specialised facet of dialling in its own right. For most of us the modern works are much simpler to understand, and more to the point, very much less expensive.

Although there are a few specialist horological booksellers today, most do not have the wide variety of dialling literature which is available. The main two booksellers who can supply direct from their own stock are:

Rogers Turner Books Ltd.,	Mrs R. K. Shenton,
22 Nelson Road,	148 Percy Road,
Greenwich,	Twickenham,
London, SE10.	Middlesex, TW2 6JG.
Tel: 01-853-5271	Tel: 01-894-6888

Both of these booksellers have facilities for examination

of the books on the premises, or an excellent postal service with payment after receipt of the books. The books are sent postage, packing and insurance free. Both of these booksellers issue catalogues which contain sundial literature, Mssrs. Roger Turner list this separately, which is more convenient.

In the Midlands members may find it more convenient to use the services of:

G.K. Hadfield, Blackbrook Hill House, Tickow Lane, Shepshed. Telephone: 0509 503014.

The Editor will be pleased to hear from other booksellers who can provide sundial literature to members.

CHARLES K. AKED

NATIONAL RECORDING OF SUNDIALS

The cataloguing of dials in this country is one of the objects of our society and the organisation of this has got to be worked out in some detail. There are very many different ways of accomplishing this, but however it is eventually done, any success it achieves will be due to two primary factors; the enthusiasm and accuracy of those of us in the field gathering information and the efficiency of the recording, storing and retrieval systems that are used. After talking to a number of people about this and having some correspondence with members I am proposing the following method:

Members wishing to take part will be issued with pads of recording forms after the style of the sample form below, together with guidance notes.

<table>
<tr><td colspan="5">BRITISH SUNDIAL RECORD</td></tr>
<tr><td colspan="3">TYPE Horizontal Equinoctial
Vertical Multifaced
Declining Scratch
Other:</td><td>DATE</td><td>MAKER</td></tr>
<tr><td colspan="3" rowspan="2"></td><td colspan="2">MATERIALS</td></tr>
<tr><td colspan="5">POSITION/LOCATION Inc. address of owner or O.S. ref.</td></tr>
<tr><td colspan="5">DIAL FURNITURE</td></tr>
<tr><td colspan="5">OTHER DETAILS</td></tr>
<tr><td colspan="5">CONDITION
Good Repair/conservation required
Fair
Poor</td></tr>
<tr><td>Record Date</td><td>By</td><td>Area Code</td><td>Local No.</td><td>Photo</td></tr>
<tr><td colspan="5">Entered/Nat No./Action</td></tr>
</table>

A members fill them up they would from time to time, be sent to a central point, a carbon copy of each being kept as a personal record. Centrally, the records would be given a National number and entered on a computer data base; printouts would be sent to all participating members every so often and when sufficient information had been obtained records could be published in volume form. It would of course be useful (some might say essential) that a photograph be included with each entry; if so we would have to decide on a standard format and they would have to be filed with the original paperwork and be stored in some place (a public library?) where members and others could have access.

Assuming that the basic framework is generally approved there will still be a number of points to be clarified. Firstly, which dials should we include? I should imagine that everyone would agree on all pre 1900 dials but I would like to include all modern ones that are not mass-produced - what do others think?

Should each participating member be allocated an area to themselves, a district, a county or more? This would avoid duplication of effort but could lead to other problems eg. precluding members recording dials they find when travelling around outside 'their' patch, when on holiday, say; it could also leave large areas of the country uncovered.

There is also the distinct possibility, nay, probability that many of you may have already made records of dials in your area or elsewhere (as I have) and it may be better to integrate these into the National record rather than having to make out piles of additional paperwork.

Finally you may have misgivings about the suggested record card; by all means do write and tell me if you have ideas for improvement or of your thoughts on any of the above remarks. I will try to summarise these for inclusion in the next Bulletin providing there is general agreement I think we should try a pilot scheme for say six months so that we have some experience as to how it might work out. At our meeting in Oxford where no doubt some democracy will be injected into the Society, members will probably wish to elect a small sub-committee to take over.

I will in any case be writing later to all those of you who have expressed a willingness to help when they returned their questionnaire.

DAVID YOUNG

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