

NASS Conference 2019 – Denver, Colorado

Recorded by Steve Lelievre

The 25th annual North American Sundial Society conference was held at the Hilton Garden Inn Denver Downtown, in Denver, CO, from Thursday, June 20, to Sunday, June 23, 2019.

There were 20 full registrations, and 9 part-time registrations. Attendees came from Canada, the UK, and the USA.

Registration and Reception (Thursday)

As in previous years, the conference opened with a combined registration and reception event with door prizes and story-telling (this year: David Ross, Sasch Stephens, and Geoff Parsons). Door prize winners: Ken Dagle (“Sundials: Cutting Time”, King & Kindersley); Art Kaufman (“Sundials: History, Art, People”, Lennox-Boyd); Bill Gottesman (reproduction Philippi dial); Bob Kellogg (“Greek & Roman Sundials”, Gibbs); Kathy Dagle (“Sundials: Design, Construction and Use”, Savoie), David Ross (universal nomographic dial, Karney after Sawyer); Shelby Grant (cardboard cutout dials); Jack Aubert (Nocturnal geocaching coin); John Schilke (CD sundial by Dave Scott); Susan Schilke (reproduction Glynne sundial); Ruth Kaufman (“Illustrating Shadows”, Wheaton-Smith); Dominic Kretsch (Analemmatic Diptych dial); Not recorded (“A dozen dials”, Ransom); Marvin Taylor (model of the Bellingham Sundial Mural); Tish Grant (Skander Equatorial / Shaw’s Universal Dialists Companion).

Sundial Tour (Friday)

Our tour took in some magnificent dials. At Denver City Park we saw the Sophis Memorial, a bronze statue of a boy with a horizontal sundial at his feet, and a Union Civil War Memorial, another horizontal dial. Also found at this location, an empty pedestal for a third dial, now missing.

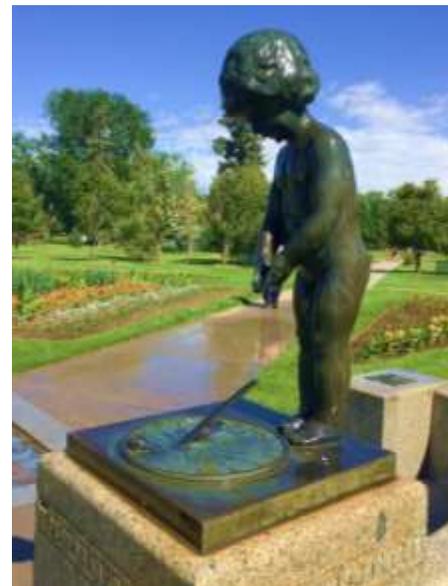
The tour continued to University of Denver’s Newman Center, the university theater, where we were hosted by Nathan Willers, from the university’s external relations department. The Bowlen Family Sundial a stunning vertical south dial, about 25m wide, is constructed of limestone, sandstone, copper and steel. It was completed in 2002.

Next, we visited Kent Denver School in the Englewood neighborhood for lunch and viewing of their fascinating astrometric tower, laid out by Kent Denver teacher David Potter with students. The tour was timed so that we would be at the tower for solar noon on the summer solstice; unfortunately, thunderclouds deprived us of the chance to see the sun light up the meridian line. The tower uses a tiny circular window in the roof as an oculus. This casts a spot of light to illuminate the dial diagram drawn on the inside of the tower.

The next stop on the tour was Cranmer Park. After campaigning and extensive fund raising by local resident Denise Sanderson, the city recently carried out an extensive renovation of the huge sandstone plaza and sundial. Sanderson was present during our visit and explained that the original stone equatorial dial was dynamited by vandals in the 1960s. The replacement is sandstone and steel.



Catalog cover from Sasch Stephens' 1985 exhibition.



Sophis Memorial Dial



Conference delegate Cory Bloomfield admires the Bowlen Family Sundial, University of Denver.



Inside of the domed roof of the Kent Denver astrometric tower. The oculus is the white dot forming the eye of the black face. The small circular element is the school's emblem.



Sundial with roses. Kent Denver School.



Detail of the astrometric dial face. Kent Denver School.



Cranmer Park dial

The Sun Shell sculpture at Aurora dates from 2004. It combines a sundial with a bandstand. The tallest of the stainless-steel arches supports a pierced disk that acts as a nodus illuminating a series of hour lines laid in the stonework dial face. The other raised elements are not relevant to the function of the dial but are components of the bandstand sculpture.

At Great Lawn Park in Lowry, we saw a 27m (90 ft.) tall horizontal dial (pictured on the next page). It is set in a park built on rehabilitated land crossed by a small river. The gnomon is a steel and aluminum needle. The hours are indicated by color changes in the surrounding concrete walkway and watercourse. Unfortunately, the gnomon is set in raised ground about 4m higher than the dial face, and is positioned incorrectly for the dial to function. Nonetheless, it is to be appreciated as a stunning and inspirational piece of public art.



Sun Shell, Aurora



Emerson School, Denver

Our final stop was the Emerson School building, where we saw a simple but nicely made vertical dial.



Great Lawn Park, Lowry

Presentations I (Saturday)

The Life & Times of William Maclean Homan

Geoff Parsons spoke about Norwegian-Scottish engineer, William Maclean Homan. In the early 20th C., Homan had a business making precision dials, including a heliochronometer with similarities to the Pilkington-Gibbs designs. Geoff reviewed the similarities and differences of the Pilkington-Gibbs and Homan designs, and discussed how competition drove the designs.

The Fresco Dials of Rémy Potey

This presentation by Fred Sawyer, with Jack Aubert, profiled Rémy Potey, a self-taught artist who is one of the few remaining fresco makers working with traditional materials and techniques. Potey has created a number of fine dials, as well as undertaking careful restorations of some of the 19th C. dials by Giovanni Francesco Zarbula, in Savoy and Piedmont.



Potey working on a fresco dial.

NASS Sundial Registry: Map & Project

Steve Lelievre spoke about his work with Bob Kellogg to develop the map of sundials in the NASS registry, recently added to the NASS website. An upcoming issue of *The Compendium* will include a call for volunteers to assist with improving the quality of information in the registry, and obtaining photos for dials that do not have them.



Fortnite Sundial. Note the unusual hour spacing.

Is there room for Sundials in Modern Pop Culture?

Shelby Grant and Will Grant discussed sundials in popular culture, including a giant Lego dial, dials as backdrops in movies, clues in TV shows, an appearance in the video game *Fortnite*, and numerous other examples, even including the sundial tattoo adorning a certain NASS member. The speakers suggested that frequent appearances of dials in popular culture encourage a positive reception for NASS' outreach efforts.

“Shadowstice” Sculpture Concept

Bill Gottesman reviewed a number of large solar sculptures from around the world – designs that produce alignments or other effects at specific times of year. Bill then introduced a season-tracking solar sculpture that he developed, and which he hopes will encourage time for reflection and appreciation of the gradual passage of the seasons as indicated by the dial.

NASS and STEM

Education and public outreach is one of NASS’ goals. Bob Kellogg reviewed our participation in Science, Technology, Engineering & Math (STEM) events in recent years, offering examples and ideas that members can use when running sessions of their own. As well as regularly participating in the American Association for the Advancement of Science’s huge annual event in Washington DC, members have organized or assisted with STEM activities at universities, schools, and even at the US National Archives.



“Shadowstice”, by Bill Gottesman. The edges of the conical upper elements are arranged so that their shadows track across solstice and equinox indicators on the dial face.

Grokking Pingré’s Dial

Alexandre Pingré was responsible for the design of an unusual multi-styled dial built in the 1760s, and set onto a monumental column outside the Bourse de Commerce in Paris. The principles behind the dial were reviewed in this presentation by Fred Sawyer. It is a type of shadow dial laid out on a cylinder with equally-spaced horizontal styles. Fred showed how changing the parameters of the dial would affect the layout and viability of a dial of this type. He then discussed some ways to generalize the design, including adding the capacity to show half-hours. Pingré’s dial was removed in the 1880s but a reconstruction is planned, and is due to be installed in the Fall of 2019.

Generalized Delineation – Multi-Centre Marking Out

Frank King discussed a range of consequences from using gnomons of various cross-sections for vertical and horizontal dials. A gnomon with a symmetrical cross-section centered on the gnomonic center can be read using the center of the shadow. More generally though, gnomons with multiple edges (multiple styles) must be dealt with by considering the time period when each style is acting as the shadow-casting edge, and using the foot of that style as the dial center for the corresponding part of the day. Frank showed how to proceed in various cases. He finished by discussing the possibility of using leading- or trailing-edge shadows for gnomons with smooth (rounded) profiles.

A wide-gnomon Foster Lambert Dial

Steve Lelievre presented his latest version of a Foster Lambert dial with built-in Equation of Time compensation. 3D printing makes it easy to produce a self-supporting gnomon with an elliptical cross-section (and hence, specifically, a circular horizontal section). This gnomon profile offers advantages in terms of minimizing a small intrinsic error introduced by the wide gnomon. After reviewing an error analysis developed by Fred Sawyer, Steve outlined an additional adaption which brings this intrinsic error below about ± 30 seconds for latitudes higher than 30° , and about ± 15 seconds at his latitude (49°).

Cylinder & Polar Envelope Gnomons

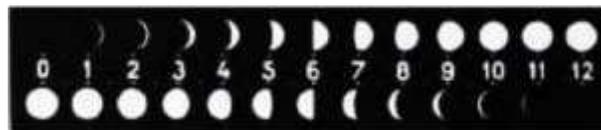
Fred Sawyer described a new form of polar dial with a movable chapter ring. The shadow cast from the edge of the unusually-shaped gnomon shows Civil Time directly. The design relies on a circular arrangement of equally-spaced hour points, similar to those of a Foster-Lambert dial. Critically, the noon mark is offset from the North-South line through the center of the hour circle. In the manifestation illustrated here, Pilkington-type calendar scales are arranged on the outer vertical walls of the chapter ring and a lower ring that also surrounds the base of the dial. By matching up the marks for the required date on the upper and lower calendar scales, the chapter ring is turned to the position needed to compensate for Equation of Time and Time Zone Offset.



Polar Envelope Dial

Lunacy for Beginners – Yet another approach to Moon Dials

In this session, Frank King discussed Moon Dials and a way to get around one of their shortcomings – the need to know the Age of the Moon, which is the number of days since the last new moon. Many moon dials rely on a lookup table to provide a correction for the time indicated by the dial. Frank discussed how the shape of the illuminated portion of the moon is related to Age, making it possible to use the shape as a proxy for Age in determining the correction - a trick first described by Hermann Egger in 1957. Frank explained how to calculate the shape for corrections ranging from 0 to 12 hours. The rather large error margins that arise for both approaches, mean that Moon Dials are inevitably rather unreliable for telling time.



*Egger's adjustment table.
Sky & Telescope, August 1957.*

Ubi Sunt

This quiz, composed by Fred Sawyer, asked delegates to identify the location of selected dials using photos in the NASS registry. Prizes were 3D-printed dials. Winners Art Kaufman and Jeff Kretsch had the choice of a Polar Envelope dial or a wide-gnomon Foster Lambert dial.

A celebration of Commemorative Sundials

We heard from Geoff Parsons about a selection of British dials related by their commemorative purpose. Geoff provided historical and biographical background to explain their significance. The dials honored: No. 1 Royal Marine Commando (equatorial); Admiral of the Fleet Lord Chatfield (equatorial with adjacent noon cannon); Battle of the Glorious First of June (vertical); Rear Admiral Nicholas Goodhart (armillary).



Ubi Sunt quiz. Q: Location? A: Washington DC.

Sawyer Dial Prize: Denis Savoie

Fred Sawyer announced that the 2019 Sawyer Dial Prize is awarded to Denis Savoie for his long career of education, research, and publication relating to gnomonics, and his outstanding portfolio of public sundial designs and restorations. In his acceptance speech (read by Bob Kellogg), Denis acknowledged his mentors Robert Sagot, Bruno Morando, and Alain Segonds, and friend and collaborator Marc Goutaudier. The presentation continued with a review of some of Denis' favorite examples of his own works – a fine selection of the impressive and noteworthy public dials that he has created.



2019 Sawyer Dialing Prizewinner: Denis Savoie.

Annual General Meeting

Please see separately published minutes.

Presentations II (Sunday)

NASS Flash 12

As has been the practice in recent years, conference delegates received a Flash Drive containing Fred Sawyer's carefully curated selection of gnomonic goodies. Fred introduced this year's selection including useful books and reference documents, slide shows of beautiful dials, an extensive collection of dialing software and utility software, and, of course, copies of all slideshows for the conference presentations.

Bath – Holy City, Holy City

The cathedral city of Bath, UK, was chosen for the 2019 British Sundial Society conference. It has been known since Roman times for the excellent workability of the local stone, which gave rise to the fine architecture and large number of abandoned underground quarries that pervade the city. A more recent hole in the ground is the famous Box Tunnel, a perfectly straight rail tunnel constructed by I.K. Brunel. Tales tell that Brunel arranged the line of the tunnel so that the morning sun would shine the full length of the tunnel on his birthday. Frank took us through his analysis of the tunnel's path and dip, comparing them to solar azimuth and altitude, and showed that they're close but not close enough, to support the supposed birthday phenomenon.

Astrolabe Videos

In this timeslot, we viewed two informative and enjoyable videos about astrolabes, selected for us by Fred Sawyer: Tom Wujec's TED talk demonstrating the use of a 13th century astrolabe, and Eddie Goldstein discussing the layout and use of the astrolabe.

Auction

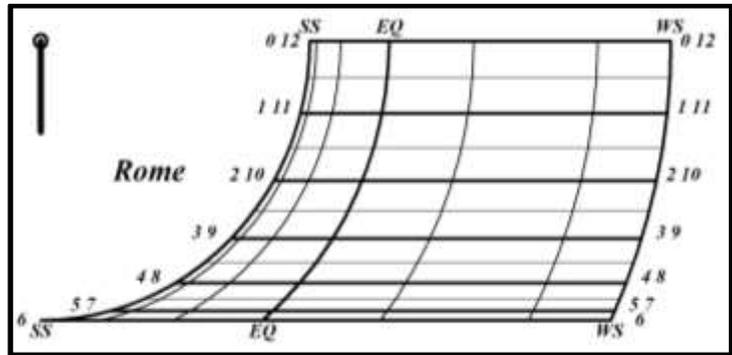
Mark Montgomery took the gavel for an auction of astrolabe-related books donated by Hal Brandmaier. The auction raised \$272 (USD) for the Society.

Ancient Portable Sundial Designs

In the final talk of the conference, Fred Sawyer reviewed the design of Greco-Roman portable dials based on the 25 surviving examples. Generally, they are treated as belonging to Types I to VI, reflecting the 6 design forms used. The same approximation, derived from the projection of the equator onto a vertical circle, applies to multiple designs.

The approximation is: $\sin t \approx (\cos t - k) / (1 - k)$, where $k = -\tan \varphi \tan \delta$. The advantage of it is that

dials can be laid out using only circular arcs and straight lines, and errors are not excessive for the latitudes of the Greco-Roman world. Fred showed the derivation of the approximation, and then introduced a hypothetical Type VII based on the same formula. It would be a card dial with perpendicular style, and thus very easy to construct.



Sawyer's prospective Type VII portable dial.

Thanks and acknowledgements

This year there was no local host for the conference. Our thanks go to Mark Montgomery, Fred Sawyer and Art Paque for the time and effort they contributed in preparing for and running the conference.

Thanks too, to Bill Gottesman, who designed and supplied the novel contemplation-themed season-tracking dial that was gifted to each delegate. The edges of conical elements are arranged so that their shadows track across solstice and equinox indicators on the dial face. See *Shadowstice* above.

And finally, an acknowledgement of Jim Tallman's fine craftsmanship as maker of the presentation sundial for the Sawyer Dialing Prize.



2019 Conference Delegates