

## NASS in Vancouver

John Schilke & Roger Bailey

August 17th was a clear, warm, pleasant day in Vancouver, BC, the Canadian site of the Twelfth NASS Conference. Our hotel, the Ramada Downtown, was a short walk from the meetings at the Simon Fraser University Harbour Centre, in a comfortable room with a fine view of the port water activity. Forty-one members and spouses registered for the events, which were ably arranged by Len and Tasoula Berggren and Fred Sawyer.



*John Carmichael explains his nodi shadow experiment to Don Petrie*

The affairs began with John Carmichael's workshop on DeltaCAD, an inexpensive program which is surprisingly adaptable to our needs in laying out and drafting dials. He showed a few tricks to make the techniques even easier.

After a brief welcome, with light refreshments, Fred Sawyer began the drawings for prizes. Len Berggren claimed a universal ring dial, and Tony Moss now has a set of dialing scales. Betsy Wilson won an acrylic dial and a copy of *The Analemmatic Sundial Sourcebook*. Thad Weakley won the "gallimaufry" of NASS items and Jeff Kretsch went away with the first edition of Mayall's *Sundials*. A copy of Frank Cousin's book, *Sundials*, is now in the library of Charles Olin. Mike Shaw took home a lovely analemmatic dial. Finally, Larry McDavid won a replica of a Beringer universal cube dial.

Friday morning Larry McDavid presented a charming discussion of his adventures with his local community of devotees of the wood scroll saw and how he designed a natural wood horizontal dial. Then Fred Sawyer told the story of one Captain Sturmy, 17th century mariner and author on "gnomonical scales". The dialing portions of the corrected second edition of his *Mariner's Magazine*, (1669) was included as part of the Conference CD.

Len Berggren discussed the sundials in the *Introduction to the Phenomena* of Geminus of Rhodes, about the 1st century BCE. The work includes description of "horologic skiatherics" - dials that demonstrate the motion of the sun.



*Chuck Nafziger's light concentration sundial, complete with Braille markings.*



*Woody Sullivan displays the MarsDial prototype*

Roger Bailey's "Timelines" was a historical review of the concept of time and of its measurement, including the day and the year, and hours (at first, prayer hours) regulated in rather arbitrary fashion by dials and clocks. He pointed out the use of the gnomon to show the hour and its tip to show the season. His review of equal, Babylonian, Italian, and even Bohemian and Jewish, hours, made that confusing area quite lucid.

Woody Sullivan showed a number of public sundial projects on the Pacific Northwest, and the dials designed to service the needs of those on Mars (and their students).

During lunch we had a chance to revisit (by DVD) the scenes from an episode of the TV program "Numb3rs," in which the sleuths find a particular city location from two photos at different times of the shadow of a basketball hoop. (NASS, and particularly Fred Sawyer, played a significant supportive role in the story.)

The annual general meeting took place. The minutes are provided elsewhere.

Fred Sawyer related his unhappy correspondence with notably vexatious Margarida Archinard about some of the 17th century work of Vauzelard and Foster. He finally abandoned any attempt to correct her misunderstandings.

In "Some New Sundials I" John Carmichael showed many of his projects, some with stained glass along with stone. Then Tony Moss described his laborious construction of a memorial dial to commemorate the 400th anniversary of the (1607) first English settlement in North America. This impressive piece of work will be dedicated and installed at our next conference in McLean, VA.



Brian Albinson describing the split analemma analemmatic dial.

Closing the presentation of papers for the day, Mike Shaw provided us with "A Sundial Buyer's Guide," consisting of five major criteria for a satisfactory dial: 1) Is the gnomon in the meridian plane and pointing in the right direction? 2) Are the edges of the gnomon straight? 3) Is the gnomon angle correct, at least to visual inspection? 4) Is there an appropriate noon gap? and 5) Is the root of the gnomon on the 6/6-hour line? These are necessary if the dial is to be at all useful and are often unmet even in products by otherwise reputable makers and dealers.

Fred Sawyer then announced and presented the Sawyer Dialing Prize to Hendrik Hollander (*in absentia*). Hollander produced a fascinating dial using an oblique cone as gnomon, thus allowing for the usual shadow as well as one showing clock time. (Cf. the enclosed material with the September *Compendium* as well as the article in volume 12, p. 1, 2005.) His letter of thanks to NASS was also read.

Before adjourning to the Water Street Cafe, Fred announced that the thirteenth (2007) conference will be September 13-16, in McLean, Virginia.

August 19th, Saturday, was another fine day in southern British Columbia, and we got the sundial tour started without much difficulty. We all enjoyed the visit to much of Vancouver, stopping first on Burnaby Mountain to see the split analemmatic dial that Len Berggren and Brian Albinson had constructed. The sun was very cooperative.



A gathering at Cornwall and Chestnut

Down again from the mountain, with its splendid panoramas, we stopped at a small Danish Lutheran church with a well constructed equatorial dial on its well-tended grounds. (Unfortunately, the church itself was closed, depriving us of seeing its interior.) At the corner of Cornwall and Chestnut we viewed and examined carefully a large, quite sophisticated horizontal dial of monumental proportions. It used the best of the available sun space afforded by the buildings surrounding it.



*Woody Sullivan and Tony Moss examine the dial at Sunset Beach*

At Sunset Beach on English Bay we visited another sophisticated dial, this one an equatorial quite near the water's edge. Kites, sun-bathers, and children were in abundance, some quizzical about our enthusiasm about a sundial. A horizontal dial in Stanley Park was a feature of a splendid Greek luncheon for all of us, provided by Tasoula Berggren and her friends.



*Brian demonstrating his layout technique*

Without question, the highlight of the tour was the visit to Brian Albinson's home, which included a tour of his dial-making equipment and of the exhibits he mounted on his front lawn. We learned much about his telescope, his dials, and, especially, his method of making analemmatic dials for schools using a

Remington powder gun. The latter technique had to be seen done in order to appreciate its speed and simplicity. He also provided each member with a souvenir of his own making, either a shepherd's dial or a Hidokei-type dial made for his guest's exact location.



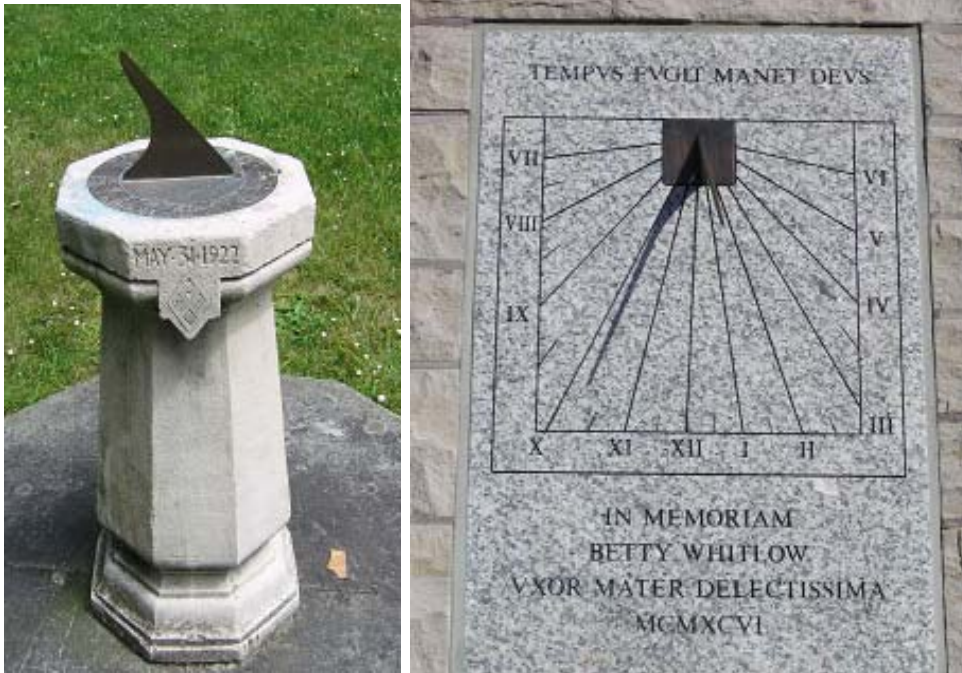
*Examining some of Brian's work*



*The Stained Glass dial in Brian Albinson's kitchen window*

Following the Saturday Sundial Tour, participants and their spouses were invited to two talks of general interest. First Roger Bailey took us on a virtual Sundial Tour of Victoria. Victoria, the capital of British Columbia is on Vancouver Island, a ninety-minute scenic ferry trip through the Gulf Islands. Two tours were presented, a downtown walking tour and a Victoria area driving tour. Two sundials are of significant interest. The vertical declining dial on Christ Church Anglican Cathedral and the historic memorial dial at St Anne Academy pictured below.

The Victoria area is famous for its public gardens. Many of these gardens have sundials; the better ones shown on the tour were standard but gnomonically correct brass horizontal dials "Counting Only the Sunny Hours". Dials on the tour included Sidney Town Hall, St Stephen's Church graveyard, Finnerty Gardens, Royal Roads University Rose Garden, Beacon Hill Park and Government House Garden. The



*The St. Anne Academy horizontal dial and the Christ Church Anglican Church vertical decliner*

carved "Orca" plinth for the Government House dial is unique and interesting. A handout with maps was provided for any wishing to take the tour.



*The Miano-Sawyer Anniversary Sundials.*

Fred Sawyer's talk, a special to celebrate the thirty-fifth wedding anniversary of Fred and Philomena Sawyer, described "The Miano-Sawyer Anniversary Sundials". I suspect that no other bride received not just one but two unique novel anniversary sundials! The first design is based on Peaucellier's principles for the construction of a sundial with an arbitrary stile, using only straight lines or circular arcs for both hour lines and declination lines. The shape of the golden hearts joined by a gold gnomon chain is defined mathematically by the inversion of the hour lines to circles. "Two who love become one, yet remain two." The second sundial, the "Kissing Dial", is described as a "Horizontal Osculatory Dial with Straight Gnomon and Diurnal Envelopes." Fred outlined the rationale for the dials, starting with pictures from their wedding, then the design principles and practice.

Both dials were custom engraved and machined in stainless steel by Tony Moss. This process he described on Sunday morning in his presentation "More Steps Towards a Stainless Reputation". These two dials were the first that he had etched in his shop using aqua regia. Tony also described some of the machining challenges and experiments with stainless steel electro typing, an etching technique using reversed electro plating.

The Sunday morning presentations started with Tom Kreyche's talk on "Three Dimensional Machining Techniques for Sundials". This presentation reviewed the operations of cutting, engraving and finishing applicable skaphe and spherical sundials. Sintered powdered metal techniques were also discussed as methods to build up three-dimensional forms.

Next John Carmichael continued his presentation on his recent activities, describing his first Painted Wall Sundial, his Sundial Cupola, and a Porcelain and Stained Glass Sconce Sundial. As the pictures show all these dials demonstrate his accomplishments as an artist and craftsman, always eager to apply his talents to new materials and styles of sundials. John was intrigued with the concept of multiple vertical sundial faces on a clock tower and decided to build a Sundial Cupola for his home in Tucson. The presentation led us through the concept, design, construction and installation. The cupola is a wood structure with a



*John Carmichael's porcelain and stained glass dial*

a copper roof and weathervane. Each dial face declines from a cardinal direction by about 28°. The 21" diameter sundial faces on the four sides are stainless steel with baked enamel porcelain lettering and finish. See [http://www.advanceassociates.com/Sundials/Stained\\_Glass/CupolaSundial/](http://www.advanceassociates.com/Sundials/Stained_Glass/CupolaSundial/).

The next project John described was a "Porcelain and Stained Glass Sconce". This innovative design built on his previous experience with porcelain dial faces and stained glass. The back lighting through the stained glass at night is an attractive feature.

The final project John presented was his first "Painted Wall Sundial". Various design options were reviewed. The final choice of design and colours evoke the image of the state flag of Arizona. John also described his experiments with gnomon design appropriate for a vertical sundial at a southern location, Latitude 32.36°.

He finally settled for a short conical gnomon.

In the next presentation, Fred Sawyer summarized three "Recent Pastimes": "John Twysden", "Nicola's Find" and "Time Tower". John Twysden was a Doctor, an associate of Samuel Foster and author of a number of mathematical publications including "The Art of Reflex Dialing" published in 1669. Fred's research on Twysden's ancestry was triggered by an email from Graham Aldred requesting biographical details. In the genealogical tables, Fred recognized links and established that he was John Twysden's third cousin, ten generations removed. Not only were they related but they shared the same birthday!

Next Fred outlined "Nicola's Find". With enthusiasm and emotion, Nicola Severino announced on the sundial mailing list on 20 June that he had found a previously unknown gnomonics manuscript, Medeltidshandskrift 47 in the Laurentius digital manuscript library, in the Lund University Library of Lund, Sweden. This Latin manuscript is an anonymous collection of Astronomy Miscellanea: treatises, descriptions of instruments, illustrations, diagrams and tables, dating from the period 1477 to 1505. Fred reviewed Nicola's find showing a series of images of drawings of sundials and gnomonic methods from the manuscript. Nicola's find is significant, predating works by Dürer, Foster and Clavius, a great demonstration of the benefit of making digital scans of historical documents available on the internet. See [http://laurentius.lub.lu.se/volumes/Mh\\_47/](http://laurentius.lub.lu.se/volumes/Mh_47/)

Fred's final short presentation was on the "Time Tower" at Engleman Hall, Southern Connecticut State University, New Haven, CT. The striking new entrance has an unusual sundial laid out on the inner circumference of a 50 ft cylindrical tower. Fred Sawyer was the gnomonic consultant on this project. This presentation outlined the design and construction. The process showed the practical difficulties in building such a large scale sundial and the need for accuracy and good communications between the consultant, architect and contractor. Fred outlined some of the field adjustments required to achieve the design specifications and function as an accurate timepiece. See "Towering Timepiece" by H. Hebel in a recent Compendium (13-3) Sept 2006.

A series of short presentations followed to wrap up the program. Brian Albinson outlined the "Error of a Single "8" Analemma and Why it is not Relevant for School Sundials". The analemma shape so often used in analemmatic sundials as a correction for the equation of time. Unfortunately the standard analemma corrects only the E/W component of the time. This works at noon when the N/S component is zero but the corrections required for the N/S component go in opposite directions before and afternoon and vary with the date. As Brian showed on the sundial tour a split hour ellipse and two analemma shapes can provide a fairly good correction throughout the day and the year. Brian showed the calculated residual error for dials with two and six correction analemmas. The correction required really depends on when the dial is used. For schools this was the middle of the day during the school term. For this service, a single correction analemma was satisfactory.

Roger Bailey then added some seaside lunacy with a presentation called "Time and Tide Waits for Gnomon" This was an attempt to use sundial science to explain the time and height of tides. The phase and declination of the moon are key factors causing highest tides in the Vancouver area during the day in winter and at night in summer. If you are planning on low tides for daytime beach walking, come in the summer months.

Thad Weakly then introduced himself and Shepherd's Watch Ltd. Thad is now working with Harris Morrison to design, produce, and market portable sundials like the Shepherd's Watch and Aquitaine Ring.

Woody Sullivan provided "An Intimate Look at the MarsDial", the first extraterrestrial sundial, mounted on the 2004 Mars Rover. Woody described the project and passed around a prototype. On the Mars Rover, a Pancam calibration target was modified to act as a sundial, as sundials are one of the simplest but most elegant scientific instruments ever devised. The MarsDial used the shadow of the sun to determine the time of day on Mars. Images of the MarsDial projected to earth and displayed on the Internet allowed people around the world to read the time on Mars.

Dudley Warner finished the program with a virtual tour of "The Time House" in Burke Virginia. This house is in effect designed around a sundial. A circular skylight projects a disc of light along the walls of this house. The light paths through the year and specifically on the equinox and solstices determined the architectural design: the location and orientation of walls and stairs.

This very successful conference was then adjourned on time.

The Thirteenth Annual NASS Conference will be held September 13-16, 2007 in McLean, Virginia (just 12 miles outside of Washington DC).



*Tony Moss & Dean Connors on a break*



*Capilano Suspension Bridge – a 'must' for tourists*



*Buildings partially block the sun from this dial – only the lines for those hours and dates when the sun strikes the dial are marked on the ground.*