Ninth Annual NASS Conference in Banff, Alberta

2003 August 21–24

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The guidebooks wax eloquent about the beauty of the Canadian Rockies and of Banff, the center for tourism in western Alberta. Although the weather was excellent, our views of the splendid mountain formations were for the most part obscured (as was the sun!) by the smoky air from the numerous serious forest fires in the area. One day we did have a hearty rain that largely cleared the air, affording us all the chance to ooh and aah at this lovely setting. We got to know the Banff Conference Centre very well, with its large dining room and even larger buffet for breakfasts.

Our pavilion at the Banff Centre

Thirty-three people attended. Two came from New England, ten from the Midwest and Middle Atlantic states, two from Florida, eight from Canada, ten from the West and West Coast, and Tony Moss came all the way from England. Things got off to a pleasant start with most folks arriving on Thursday and enjoying the conviviality and some early dial exhibits. Fred Sawyer brought a splendid collection of small but lovely door prizes, including dials and even a nocturnal. The prizes went to winners of a Sundial Bingo game.

Friday began with breakfast and then **Roger Bailey** explained his approach to "Designing a sundial from scratch" for this area, latitude 51º, using first a doughnut and stick to make an equatorial. He then went on to show how to make the gnomon base with it, using the relationship tan Hour angle = tan Time angle x sin Latitude, and its variant for the vertical dial, tan Hour angle = tan Time angle x cos Latitude. He noted that the substyle height is sin SH = cos Latitude x cos Declination. The beauty of this is that one uses only a ruler and compass.

Roger Bailey

Then **Fred Sawyer** took us on an intriguing tour of the strange but fascinating world of Charles-Nicolas Peaucellier, the 19th century French engineer, the man who taught the world how to draw a straight line – that is, without using a straightedge produced by means unknown to the user. His linkage to do this was used to convert mechanical rotary and rectilinear motion smoothly and simply. In 1856 he published a type of dial using only straight lines for the hour and declination lines and an arbitrary style. Fred also covered a variant of these dials that uses only circles for the hour and declination lines. These resulted from Peaucellier's study of inversion geometry (including "reciprocals of lines and curves"), popular at the time.


Paul Nibley with his alarm sundials

Ken Clark then presented a dial that he fashioned from a picture frame for a friend. His simple technique results in a very straightforward but accurate dial.

In "Projections of the sphere for universal astrolabes" **Tom Kreyche** gave meticulous definitions of the various terms in trigonometry and projection geometry. Having done so, he showed the virtues and drawbacks in accuracy and convenience using an equatorial, as opposed to stereographic, LaHire, and orthographic projections of points on the celestial sphere onto a plane, and how these are more easily used in constructing portable dials.

Certainly, both the conferees and other members of the public at the Centre were amazed and delighted by loud reports from the ingenious machines that **Paul Nibley** had built and put on display. These "Adjustable sundial alarms," three in number, ranged from an elegantly built noon cannon to other much more fanciful devices that announced the sun's arrival at the meridian or other appointed time with a bang! (On this day, the poor sun actually was forced to cross the meridian several times to accommodate the eagerness of many to hear them "work" with small firecrackers.) Paul expressed the hope to make several more of his "industrial model" and his "butterfly model," complete with solar cells that powered a chime when the wings of the creature opened. He was heartily encouraged by the crowd.


Paul's first alarm dial

Following the annual general meeting, **Ross McCluney** and **Fred Sawyer** explained how they and Bob Terwilliger started NASS, using e-mail contacts for quite some time before any met in person. They were stimulated to do so by Steve Weiner, who was building the Florida Disney World and an office building there. They did finally meet for the first Conference, held in Washington, DC in 1995. The second Conference, the next year, was in Toronto, there because of the large number of

Canadian members who attended the first conference.

The intrepid **Tony Moss**, one of our English members, usually creates beautiful new dials but also conventional ones in brass. In his talk, "Towards a stainless reputation," he described some problems in working with stone and lead and then went on to discuss stainless steel as a medium in several of his projects and how he overcomes technical difficulties in the workshop. Further, he talked about vandal-proofing and restoration techniques. He showed the dial he has been working on in Svalbard, probably the world's most northerly at 78º latitude, complete with pictures of the dial and of its attractive sponsor.

"Desperately seeking Vaulezard: a tale of frustration," was just that, as **Fred Sawyer** had us follow in his plodding steps, trying unsuccessfully to unravel the historical mystery of who Vaulezard really was. He could not find the man's Christian name nor anything about his lineage. In spite of the lack of success, the importance of this 19th century author was clear; he may well have been the first to describe and to name the analemmatic dial, though even that claim remained unsubstantiated fully. Mention, of course, was made of the analemmatic dial at the church of Brou, in France (which has been moved at least twice, further obscuring delineation of its history and any connection to Vaulezard).

Roger Bailey then asked us to expand our multicultural interests and to consider the horizon and archaeoastronomy. He discussed the moon, the sun, stars and constellations and the concepts of the day, month, and year throughout the Stone Age, Greek and other ancient cultures, the Renaissance, then up to the present day, showing how setting of horizon markers helped track the cycles of nature. He included the Mayans and the "medicine wheels" of the Western Plains, as well. While noting the problems of over-interpretation of archaeological findings, he showed how all these concepts fit in with the gradual accumulation of knowledge and, hence, of power.


Helm Roberts (l.) receiving the Sawyer Dialing Prize from Fred

Fred Sawyer then presented **Helm Roberts** with the fourth Sawyer Dialing Prize for his design and construction of the Kentucky Vietnam Veterans' Memorial. The award dial this year was a beautiful special edition of Jim Tallman's Spectra Sundial in etched glass. The certificate read in part: "In recognition of his understanding that the spirit of a sundial can not only stir the imagination but also help to heal the heart and preserve fond memory, as evidenced in his design of the Kentucky Viet Nam Veterans' Memorial.

Helm Roberts then gave an intriguing and moving presentation, "Making the Memorial – the design, theory, and construction of the Kentucky Vietnam Veterans Memorial" at Frankfort. The gnomon is made of stainless steel, and the end point of its shadow annually touches the engraved name of each of over 1100 soldiers on the anniversary of the day he/she was killed in the war. The political and mechanical issues are fascinating, and the result truly an artistic triumph. Helm is a new and most welcome member of NASS.

Following the presentations, **Phil and Fred Sawyer and Susan and John Schilke** hosted a Champagne Reception, to celebrate their 32nd and 40th wedding anniversaries, respectively (which occurred during the Conference).

The NASS Dinner featured **Dr. Gordon Freeman**, Albertan scholar, who presented his research on the Majorville Medicine Wheel. His remarks included a plea for extreme care in finding and excavating such sites, lest they be ruined for future research and appreciation.

Several people gathered outside following the discussion to try out the nocturnal on the stars, which had obligingly appeared in spite of smoky weather earlier. In addition to the nocturnal instrument, Fred discussed two simple arithmetic techniques for reading the time from the stars.

Jackie & Don Petrie talking with Paul Nibley

Bob Kellogg with Warren and Susan Thom

SATURDAY – A Tour of Sundials in the Banff Area

ON SUNDAY MORNING the conference reconvened at the Banff Centre. **Roger Bailey** discussed some of the problems involved with "Error analysis for garden variety sundials." Most enthusiasts sooner or later are approached with the query, "Can you help me with this dial that I just bought at the garden store?" Here we got some practical advice on how to handle such difficulties, including installation and orientation, with twistings and tiltings. In many cases, however, such as that of the Garber house dial, it is best to "leave well enough alone" and accept the fact that the dial may never be truly workable but remain only a pleasant garden fixture.

We expected **Len Berggren** to talk about Geminus, but he decided instead to describe his and Brian Albinson's efforts to design and construct an analemmatic dial with dual analemmas to approximate mean time at Simon Fraser University, in Vancouver, BC. He mentioned using the 12 o'clock mark and the origin of the ellipse as two points from which to locate the time markings (in this case every half hour), which is easier and more accurate to construct on the ground. He seeks an appropriate motto in Scots Gaelic, if possible. **John Schilke** volunteered to help in that regard.

Following up on John Thew's invention 45 years ago of a simple dial that cast hour numbers onto a blank plate, several authors (such as Ian Stewart) described further elaborations of the idea. In 1997, **Bob Kellogg** and Werner Krotz-Vogel and Daniel and Hans Scharstein independently patented their own variations, the topic of Bob's well-illustrated paper, "Digital sundials." This is a world of clever design and meticulous

craftsmanship, not yet fully explored. We expect that Bob and others will bring us even more curious devices in future.

Finally, **Fred Sawyer** took some of J. H. Lambert's ideas and his own equant design and combined them with analemmatic principles to produce a dial with equally spaced hour points, thus simplifying corrections for the equation of time. Further, this "Self-orienting analemmatic equant" is latitude-independent, quite a remarkable device.

The Conference closed on time with discussions still going on in the lobby. We all offered profuse thanks to **Roger Bailey** for hosting an excellent conference.

An attentive audience in the Banff Centre's excellent lecture hall.

Larry McDavid, Derald Nye and Ken Clark

Next year's conference will be August 19-22, 2004 at the Clinton Inn in Tenafly NJ. Our local hosts will be Robert Adzema and Hal Brandmaier. The sundial tour will include a number of Robert's sundial sculptures. Plan to be there!