

Meeting in Utrecht, 26 September 2009 Secretariat 3

About twenty persons were present. – The Appingedam show is almost over; many Zonnewijzerkring objects were on display. – The Geldermalsen Sundial Walk plans won a newspaper contest. Contact Astrid vd. Werff has enlisted the help of Fer de Vries of De Zonnewijzerkring. – Ideas for the 2010 excursion: the Genk sundial park, or perhaps the observatory with the giant equatorial coordinate ring, sundial and obelisk near Oberhausen in Germany. – Maes suggests the tables of contents of the Bulletin be made accessible on the internet; Holman shows a graphic by vd. Voorst; vd. Hoeven finds storage of the Hagen legacy expensive and Vesters may be able to help; Maes shows a copy of *Time in Antiquity* by Hannah.

Sasbrink, Vesters and Pals are building a projector to illuminate sundials for demonstration purposes. Three lamps move around a polar axis; one in the equatorial plane, one above, and one below, corresponding to equinoxes, summer solstice and winter solstice, respectively. There is a parallax error, but for the purpose of this display, it does not matter much. – Sasbrink shows photos of his work: the Loppersum armillary, and his 'clock' dial with the 360 degree 12-hours display. – Maes introduces the German sundial catalogue (13000 listed), of which a new imprint is about to appear. Buyers may already consult the databases online. – Maes attended the Appingedam Expo opening. He found the instructive value less than hoped. – He mentions several sundials, such as one in an Underground station in München. – Coenen talks on the Martini Tower dials. He also discovered a sundial on the Soestdijk former royal palace. – Hollander is building several new sundials: in Emmeloord, Hellevoetsluis, Maastricht, Almere, Spakenburg, and Voorschoten; and Witmarsum and Zaanstad. – Holman designed a public sundial featuring steps around a pole style with water running down these steps. Unfortunately the design will not now be built.

In memoriam A.G.M. (Ton) Bron D. de Groot 6

Zonnewijzerkring member Ton Bron, age 66, died on 8 October 2009. Ton hardly ever missed a meeting, or an excursion, of which he helped organize two. For years, Ton wrote "Sundials in The Netherlands", and he visited each sundial before he wrote an entry on it. Master of many crafts, Ton made several clocks and sundials. He showed this solar-powered motorized sundial on the 2000 excursion.

We offer to his wife Yvonne and the two children our sympathy.

British Sundial Society's 2010 Annual Conference Patrick Powers 6

(the article is in English)

Honours for Fer de Vries "Rond 't Hofke" 7

De Vries received a municipal decoration for his volunteer work, now 12 ½ years, with the *Mills of Eindhoven* foundation. Fer operates the Coll water mill each Saturday, organizes excursions, and is host to visitors and the media. – Other activities by Fer include giving computer instruction and delivering the community newspaper. Mostly, Fer is internationally recognized for his work in sundials and sundial calculations.

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Sundial Walk Geldermalsen

Marga Robesin

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Inspired by the Tricht sundial by Astrid van der Werff and by her sundial lecture, the purpose of the Sundial Walk Geldermalsen Foundation, of May 2009, is to build a unique sundial in each of the villages of the Geldermalsen district, and to connect them through a walk and bicycle route. There is the newspaper prize money and a promise from a local bank, and donations are welcome. Talks with contact persons in the villages have already been initiated. There was a study trip to some Utrecht sundials, and one to Rupelmonde is on the agenda. The first new sundial in the Geldermalsen district is expected as early as 2010.

Differential dialling scales

F.J. de Vries

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De Vries explains the new scales invented by Fred Sawyer. See also *Compendium* for September 2009. – Fig 1 shows a classic dialling scale. Note its symmetry about 9 and 3 o'clock, corresponding to an hour angle of 45 degrees. Fig 2 shows its use: measure off the latitude along the VI line, lean the scale against the XII line and draw the hour lines through the appropriate marks on the scale. Am hours mirror pm hours.

A generalization is possible (1997) and Fig 3 shows a scale symmetric about 2 and 10 o'clock, or $s = 30$ degrees, with the latitude scale changed accordingly. There remains the drawback of the latitude scale being packed together over 60 degrees.

The new differential scale, using a 1933 patent by Boardman, solves this by measuring latitudes between 0 and 45 degrees in the usual way, but measuring latitudes between 45 and 90 degrees from $\phi - 45$ degrees. For $s = 45$, this would make the latitude scale 2.25 times as long. But for $s = 55.6..$ degrees, the latitude scale is the same length as the hours scale, as shown in Fig 4.

The space between 45 and 90 degrees is now perhaps too wide, and Fig 5 shows another example with $s = 50.7..$ degrees. Note the split latitude scale. Fig 6 shows its use for 60 degrees latitude: the 60 mark is on the XII line, and the correct point is read at the 15 mark; 15 being $60 - 45$, or latitude minus 45 as mentioned earlier.

Mirror sundials

H.J. Hollander

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Many sundials use the shadow of a specific point. This point is often called nodus if it is on a pole style. A shadow caster at right angles to a dial face is commonly known as a gnomon, and its tip is used as nodus.

A reflecting nodus, in the present paper, is a small mirror used in a sundial. Use of a reflecting nodus will also mirror the hour lines. The use of a horizontal mirror with lines on a ceiling or in a stairwell is well known. Other than the lines being mirrored, the properties of the pattern remain unchanged.

The mirror may, however, be placed in any position. One way to determine what the resulting pattern will be is by looking at the orientation of the reflected pole style.

Fig 3 shows an equatorial dial and a mirror parallel to the equatorial plane. The reflected pole style is parallel to the real one. On a new face, parallel to the original one, the hour lines will again be uniformly spaced. But we may give the reflected pole style any orientation by suitable mirror placement. In Fig 4, the reflected pole style is vertical, and the uniform hour line spacing appears on a horizontal dial face such as a ceiling [or floor, when the sun is low enough]. At 52 degrees latitude, the pole style needs to be rotated through 38 degrees to point it toward zenith; the mirror is thus rotated 19 degrees. Or it may be rotated a further 90 degrees, pointing the reflected pole style towards nadir, for a uniform pattern on a floor or ceiling.

Some general points transpire: 1. A well placed mirror will produce any sundial on any plane, such as an equatorial dial on an inclining northwest wall, or a direct west dial on a

horizontal plane. 2. The properties of the dial remain essentially the same: on the equinox, the light beam will graze the dial face of any reflected equatorial dial. 3. All dial types come in pairs, with mirrors 90 degrees apart. The pole styles of the pair are parallel, but the rotations of the light spots are opposite. 4. Generally, the mirror should reflect on both sides. To determine when a side is irradiated, the pertinent equations for a plane sundial in the same orientation could be used. 5. All the above describes just one nodus. A complete style could be built out of a number of reflecting nodi.

Practical examples. Fig 6 is a postcard with a uniform dial on a south face, showing standard time for Utrecht. The mirror is rotated 26 degrees in order to rotate the pole style from 52 degrees into the horizontal plane. In Fig 7, an armillary dial is tipped over into a vertical arc; a complete pole style needs several mirrors. Finally, Fig 8 shows a polar cone. The mirror is canted 19 degrees for a vertical reflected pole style. To the left, the light spot reads 12 hours local apparent time on 10 July; in the middle it is 13:45 LAT. The right picture shows in detail the canted reflecting nodus.

Sundial at De Valk is slow! Leidsch Dagblad 18

In an interview, our member Maes says that the difference between civil DST and the sundial reading can be explained by daylight saving time (60m), by the longitude of Leiden (42m, although the sign says 36m), and by the equation of time (4m at the time of the interview). That still leaves about a quarter of an hour. Perhaps a lorry hit the pole style, or the base has subsided bit. Of course, we should consider ourselves lucky that the dial runs *at all*, unlike all the other official city clocks.

DGC: excursion to London DGC 19

A pointer to the announcement on the DGC website.

Second edition of the DGC-catalogue F.W. Maes 20

For visitors to Germany and Switzerland, the 1994 DGC catalogue *Sonnenuhren – Deutschland und Schweiz* is an indispensable resource with 8000 entries. But new sundials are built and existing ones rediscovered, and the DGC database now contains about 14000 entries. A second imprint of the catalogue is needed, but this poses a financial risk because there is no guaranteed number of buyers.

This problem has been solved. Interested parties may sign up for this new edition with a down payment of 30 Euros (the expected price is about 50 Euros). Should the catalogue not be printed, the deposit, minus 5 Euros, will be refunded.

Meanwhile, subscribers already have full access to the on line database which is kept up to date and, in many cases, even contains photographs of the sundials. Users may add picture and comments, and add new sundials.

Sunrise and the founding of the 'Old Jan' in Velp F.W. Maes 22

Was the orientation of this old Romanesque church determined using the direction of sunrise? That direction varies over the year, over a range that depends on latitude. On the equator, sunrise is from 23.5 degrees north of east to 23.5 south from east; on 53 degrees north, the extremes are 41.5 degrees north and south from east.

The direction of Old Jan is 17 degrees north of east. Astronomical sunrise – when the centre of the sun is on the horizon, neglecting atmospheric effects – has this direction about 15 April and about 27 August. Now the elevation of the local horizon, in this specific case, happens to be zero degrees. But daily life definitions of sunrise tend to be different and perhaps variable; Fig 7 shows the effect. And there is the calendar to consider. In the year 1100, there would have been a difference of about 7 days between

the Julian and Gregorian calendar. Summing it all up, sunrise would have been 17 degrees north of east somewhere between 6 and 11 April, of between 18 and 23 August. One source states that the Abbot of Deutz was in Velp on 22..23 August, and it is quite possible that he personally supervised the measuring of the Holy Line at dawn on the twenty-third.

Research by Sanders (131 churches) and Hinton (1670 churches) enables one to discard many of the theories concerning the establishment of the Holy Line. One possible explanation is that by Sanders, who points to the late equinox caused by the slow Julian calendar. Roebroek adds that, in the low countries at least, the weather is often cloudy days on end, delaying the first possible sunrise observation.

New sundial in Emmeloord H.J. Hollander 28

'Concern for Work' helps people re-enter the labour market. They act as intermediaries, but also have their own businesses. On 15 October 2009 their new market garden was opened in the presence of HRH Princess Margriet. On that occasion, a sundial by Hendrik Hollander was placed near the entrance. – This is a horizontal sundial for legal summer (daylight saving) time, neglecting EOT; and for the start of the seasons. The style triangle depicts a person with a wheel barrow. The base is stainless steel.

New sundial on the dome church of Witmarsum F.J. de Vries 29

In the 1940s, the church clock was at the top of the cupola tower, and there was a sundial at the bottom. During restorations in the 1960s, the clock was moved to the location of the sundial. The sundial was in poor condition, and was removed.

With the restorations in 1996, the cupola tower was restored to its original style and red colour. The clock moved back to the top of the tower.

Because there was now space between the belfry windows, the then church wardens decided to reinstate even more of the former style, and to place a sundial on the lower part of the tower again. The new sundial was installed on 19 May 2009, but at the time it was partly hidden by the restoration scaffolding.

On Saturday 4 July, the sundial was officially turned over to Otte Leijendekker of the College of Church Stewards. (Bolswards Nieuwsblad, 8 July 2009)

This is a vertical direct south dial by Hendrik Hollander. 104x104cm, wood, painted, gilded brass numerals and half-hour dots, gilded pole style.

New sundial in Voorschoten H.J. Hollander 30

Earlier, member Hoogenraad won the "best idea of Voorschoten" contest. His idea – a sundial – is now realized. Mayor Staatsen and councillor Van Herk unveiled it on 19 November 2009. This sundial by Hendrik Hollander, in Adegeest Park, shows legal summer (daylight saving) time, neglecting EOT. It has six date curves, including those for the start of the seasons and one for the Voorschoten horse market. Its motto, "Sine sole sileo", means: Without the sun I am silent.

DGC-Fachkreis Sonnenuhren: 2010 conference DGC 31

Invitation to the 2010 annual conference of the Sundial Branch of the Deutsche Gesellschaft für Chronometrie, in Grünberg, Hessen, Germany.

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