

- Summer excursion to Dinkelland B.P.U. Holman i
A registration form for this year's excursion in the Almelo, Ootmarsum, Dinkel region.
- Account of the January meeting Secretariat 3
Over twenty-five members attended this meeting. Discussion on the subjects of the Hagen library, the Sundials in the Netherlands section, honorary memberships, the Literature section, the Secretary vacancy. – Sasbrink guides a Lichtenvoorde sundial replacement. Maes is guiding the Bakkeveen multiple dial restoration. De Vries reports that the Column of the Gods sundial is finished. Hooijenga was juror in the Flemish sundial contest, but is kept to secrecy. – Holman reports on the Ootmarsum time museum, work on which is hoped to start in 2007. Meanwhile, the name is changed from *Chronomium* to *National Time Museum 'Christiaan Huygens'*. – Holman and Hollander explain the Time in the Garden project round Ootmarsum, preparations are on schedule. The excursion this year will be there. – This concludes the 'official' part.
Holman speaks in detail on his methods of making sundials that last many years. – Van den Beld made an equatorial sundial with a clock face and showed an elegant solution for the necessary angle-doubling transmission (photo). – Pals built some pyramids to experiment with their shadows, in a reaction to the Van Gent lecture in last meeting. Pals also converted small clocks into sidereal time clocks. – De Vries had Prof. Oki of Japan visit him. Oki gave him a sundial book featuring dials in The Netherlands, Belgium and Italy that Oki visited. The accompanying text is in Japanese. – Groeneweg asks about a piece of a slate dial (photo) found near Zwolle. Holman is taking this up. – Hollander shows some of his Perspex 4" dia 1-3/8" ht sundials (photo). – Louwman gave away some copies of a booklet of Dutch sundial mottoes, collected by A. van Haghe about 1928. The in-fill shows an almost-west Italian hours dial. This charming "Chicken time" dial shows hours until roost, using eggs for numerals.
- Account of the Annual and March meeting Secretariat 6
Twenty-three members attended. Chairman De Groot mentioned the death of Theo van Rhijn, the Society's first formal chairman.
The annual meeting. Maes reports the successful restoration of the polyhedral sundial of Bakkeveen. – Sasbrink reports the Lichtenvoorde replica almost finished. – A wooden sundial of 1805 was found in Ootmarsum and Holman will deal with it. – Remnants of a stone dial of the Sibculo monastery, found in 1928, are discussed to see what may be done with them. – Maes is investigating an old polyhedral sundial at the Franeker Planetarium. – Hans de Rijk is made honorary member by unanimous vote. – Verschuuren has finished the Hagen library catalogue.
Hollander shows a copy of the Perspex sundials he made for NASS. – Horikx wrote a guide to making sundials and offers it on CD. – Sasbrink went to look for a polyhedral dial by Echten House, Hoogeveen, but only found a pedestal. – Holman reports on a large sundial project in De Lutte. – vd Hoeven comments on difficult to follow articles in the Bulletin. – De Vries shows how a sphere may be used as a gnomon on a horizontal dial.
- In Memoriam: Theo van Rhijn Secretariat 9
Theodorus Van Rhijn died 4 March 2006 at age 90. In 1980, he became the first chairman of the Zonnewijzerkring, the society previously having done without one. Theo promoted the Zonnewijzerkring and found sponsors. We are greatly indebted to him.
- Hans de Rijk made Honorary Member Secretariat 10
De Rijk, who celebrated his 80th birthday in February, was made Honorary Member at the March 2006 meeting of the Zonnewijzerkring. One of the founders, he has been continuously active. He wrote many high-quality articles in the Bulletin, and in various renowned foreign journals. He also wrote several books. – In the same meeting, Hans was also re-elected society committee member.

- Hans Noordmans is Frisian Amateur of the Century P.J.K. Louwman 11
 The Frisian section of the Royal Dutch Society for Meteorology and Astronomy proclaimed Hans Noordmans to Frisian Amateur Astronomer of the 20th Century. Hans was quite surprised (photo). The jury praised Hans not only for his personal achievements, but particularly for his contributions towards the advancement of the art.
- Royal honours for Dees Verschuuren Editors 11
 Co-founder, chairman and passionate volunteer worker of the Paagman Observatory, Dees Verschuuren was knighted a Member in the Order of Orange-Nassau (photo).
- Aimé Pauwels wins Flemish design contest E. Daled 12
 On 27 December 2005, the jury, consisting of Leenders, Lyssen, De Graeve, Daled, and Hooijenga, chose the winning design of the sundial contest. After grading all entries on several points, it turned out that Pauwels was the undisputed winner. The drawing shows what his sundial, a large north-west declining vertical, will look like on the front of the Rupelmonde society building on Mercator Square.
 The dial will probably be plasterwork. The hour lines depict a bright yellow sun, with hour numerals in metal or plastic. The pole style gnomon will be a metal tube.
- Associations F.J. de Vries 14
 In *A gearless reducing rotating transmission*, in last Bulletin, Van den Beld used two channels and sliding pins to create a gear reduction. The construction reminded De Vries of a 17th century sundial that uses this construction in an ellipsograph [see <http://www.ies.co.jp/math/java/conics/toy/toy.html> for a Java applet].
 The gnomon moves along an elliptical date scale in this manner. With the gnomon on the correct date, the sundial is turned until the shadow falls over the XII, after which the actual time is read by a magnetic compass needle balanced on the gnomon tip.
- Lectern dials old and new F.W. Maes 16
 Most Dutch lectern dials could aptly be called block dials, many having a stone sphere on top instead of the 'lectern'-like equatorial-plane sundial. The author's call for information did not go unanswered; he sums up some of the results.
Bakkeveen: restored and back in place (photos). *Wezep*: traced (photo), to be described later. New: *Dronrijp*. This block (photo) was long used as a doorpost support! Dials of this type are usually dated 17th or 18th century. *Echten*: rumours had it that there would have been a third dial by the Echten farmstead. Sasbrink did not find it yet.
Doorn/Driebergen: no new information has yet come in.
- Martini Tower dates – continued E.L.H. Roebroek 18
 Currently, the oldest found reference to sundials in Groningen is from 1571, where the bailiff of Wedde pays Mr. Arents twelve Thaler for 'the making of a chart for his solarium'. In 1579, Master Arent Maler, possibly the same as above, was paid for three sundials on Martini Tower and for work on the bell cage. And there have been found two warnings to clock setters to work precisely according to the tower gallery sundial (1694, 1702). We may yet get the big picture. When was the large vertical installed? It could lots earlier than the 1748 we assumed.
- Complementary, supplementary or opposite? J. Borsje 19
 When two vertical sundials have declinations that are 180 degrees apart, careful thought is needed to understand how their hourlines are related. They are really the same plane and nominally share a gnomon. A drawing explains. Borsje recommends dropping the use of 'complementary' or even 'supplementary', and using 'opposite' instead.

'Solar time' at Ulrum E.L.H. Roebroeck 21
 A 1939 farmstead lease announcement mentions "solar time". Why? Apparently, many farmers kept on using local apparent time in their work, civil daylight saving time making them early on the fields, when all is still dark and wet.

The Book of Time: Genk nr. 12 F.W. Maes 22
 The open book by Jean-Michel Ansel is a classic example of a polar sundial. The dial face is parallel to the pole style, and so are the hour lines. A nodus indicates the date, like on a horizontal dial. The Latin on the stand means *Time is eternal; our ways imperfect*, the last word punning on the double meaning of "not ideal" and the more literal "unfinished". Unusually, the date lines indicate not the passage of the sun into the next sign of the zodiac, but into the next actual constellation. Ophiuchus, the Serpent bearer, though not a sign of the zodiac, appears on the dial. Libra does not, even though the sun spends 23 days in that constellation. Its time was added to Scorpio, which by itself spans only 6 days on the ecliptic.

The Book of Time spans only eight hours. The range of dials like these may be increased by curving the dial face the other way (fig. 7). This brings the author to the correct definition of a polar dial. Today, the dial face is expected to contain the east-west direction, but formerly, this was specified as a polar south dial, implying that one could call vertical east and west dials, and all intermediate variants, polar, too. The book dial in fig. 8a could be called a multiple polar sundial. Also, the dial face could be curved, or Ansel's and van Grieken's books would not be polar. Then again, the author would hesitate to call a cylinder dial a polar dial, although its hour lines *are* parallel to each other and to the polar gnomon.

The gnomon is not always straight, either. In order to arrive at equally spaced hour lines and/or parallel date lines, variously curved gnomons have been developed, from De Vries' and Sanders' cycloids to Bilts three-dimensional 'S' gnomon. Oyen used a quarter-circular gnomon with parallel (but not homogenous) hour and date lines. There may be a case, however, for calling these dials monofilar rather than polar.

Analemmatic sundial pitches tent in Franeker F.W. Maes 28
 Since September 2005, there is a brand new analemmatic sundial on the Breedeplaats in Franeker. Much to his surprise, the author found it in the shade of an enormous tent-cloth, there on special occasions, such as the celebration of the 225th birthday of the Planetarium on May 19 2006. – The major axis of the sundial is eight meters. All twenty-four hour points are on black granite paving stones, with Roman numerals from five to twenty hours MET*, and a glass star with flickering night lights on each of the remaining stones. – Not everyone is pleased with the tent construction. One reaction goes, "For sale: sundial; works everywhere in the world, except Franeker".

Google Earth, de ultimate travel guide F.W. Maes 30
 So far, the author has found thirty sundials on the Google Earth material. Some examples are shown in this how-to article. Patience, fast internet and knowledge of the terrain to be searched are prerequisites. The photographs (locally taken and from GE) show the Molenwerf, Leiden dial, the one at the Jardin de Reuilly, Paris, the nodus dial in the German patent office in Munich, and the analemmatic dial in front of the Deutsches Museum, also in Munich.

Bi-gnomon sundials, part two H.J. Hollander 34
 Of the sundials described in the first instalment, we can say that 1) the working range is mainly to one side of the line connecting the gnomons, and 2) therefore, some hours are not covered. Now, Hollander shows two examples of sundials with a conical gnomon, where the 'left' side is used in the one time system, and the 'right' side in the other; one with a classic cone, and one with a distorted cone.

Fig. 1 shows how an hour line is built. For lengthening and shortening days (corresponding to the sides of the cone) and for every declination, the shadow is drawn

and the intersection marked. After enough data for a certain clock-time has been collected, the hour line for that clock-time may be drawn.

Fig. 2 shows the complete hour line set for a cone sundial. The circular base of the cone is drawn in, the apex is over the cross. Fig. 3 shows how to read the time on various dates in the year. – The hour lines are visibly curved. By distorting the cone, the hour line shapes can be improved. Here, the base of the gnomon is an ellipse, and the apex is over the perimeter of its base. Hollander calls it an “ellipsoid cone”.

[The body may still be described as a ‘general’ cone, its tip being the vertex, and the ellipse base the directrix.] – Figure 4 shows an example with semi minor axis 1, semi major axis 3, and gnomon height 3.5. This changes the shape of the hour lines so that the dial is read more easily.

Earliest equation-of-time loop?

F.J. de Vries

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In his quest for the earliest integrated EOT loop (as opposed to merely a table or graph of corrections to be applied afterwards), Chr. St.J. H. Daniel, chairman of the BSS, previously identified two early examples, both also described by Marinus Hagen. Daniel dates the David Coster sundial around 1726. The other, an armillary sphere with EOT loop, appears on a 1740 painting by Nicolaas Verkolje.

His last find is a sundial of 1716. This German-made dial, made by Vogler, for Von Wurzelbau, is in the Greenwich National Maritime Museum (photo). It is a portable universal equatorial dial (although De Vries would rather refer to it as a cylinder dial). The equation-of-time loop is in the centre of the hour and date scales. A bead in the centre of the cylinder is the nodus.

The Latin inscription is left untranslated.

[I think it means “Newly invented sundial from tables {given} by John Phillip Wurzelbau, indicating the natural daily equation-of-time according to the Nuremburg meridian of 49 degrees and 26 minutes. John Michael Vogler in Ellingen made {me}”.]

Sundials in The Netherlands

A.G.M. Bron

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Gelderland: **Deventer 01**. Analematic sundial at the Environment Centre. Numerals (7 to 20 hours) on 30cm (1 ft) stone blocks. Stone date scale. Calculations by F. de Vries, construction: Environment Centre staff and volunteers. **Rheden 01**. Triple timepiece, a large horizontal sundial with an analogue clock in the polar style, and a digital one at the end of it. Eleven hour discs, 1.3 m (51 in) diameter each. Design: Jos Spanbroek.

South Holland: **Rotterdam 11**. Round horizontal sundial, 1.26 m (50 in) diameter.

Arabic numerals from 4 up to 20. Plaque: “Gift of the Rotterdam Medical School, 19 May 1970”. **Schiedam 02**. Vertical sundial of 2003, on the side of one of 241 renovated houses. Height 3,5 m, width 4,7 m (11x15 ft). Roman numerals, VI up to IV.

Oegstgeest 01. A simple brass armillary sphere, 72 cm (28 in) diameter. V to VII. On the grounds of Oud-Poelgeest manor. A beautiful old pedestal. **Wassenaar 05**. Open armillary of commercial design. 37 cm (16 ½ in); thick brass; 2005. By ‘WT design’.