Bulletin 99.4 English summary

R. Hooijenga, T. Brandsmastraat 42, 1964 BV Heemskerk, The Netherlands
Email: r.hooijenga@rhayward.demon.nl (home) or r.hooijenga@lvnl.nl (office)

Contents of the September 1999 Bulletin, nr. 71

19 June (the Saturday closest to the summer solstice) the Society went to the province of Groningen to visit some of the fine sundials there. Our host was Eugene Roebroeck, well known for his knowledge on the subject.
We started on the Fracylema estate (Slochteren). Here is a dial consisting of two cubes, one diagonally on top of the other so forming eight vertical dials. On top of that is an equatorial dial in the form of a star, on which time is read not only on the upper and lower faces, but also by using the edges and sides of the star points as so many polar dials. While checking the EOT, some members realised that even in our small country their watches, cleverly set before the trip to show LAT or "dial time", was 8 minutes slow here.
In Appingedam, we saw a polar dial with straight date lines. The date is read not by the shadow of an index, but by the shadow of the intersection of the style and a curve in the equator plane. The dial could thus be called a bifilar dial (when the author wrote his account, he had not caught on to this yet).
The Menkema estate (Uithuizen) of 1722 is now a dependency of the Groningen Museum. The dial looks a little like the Fracylema dial, but the twelve-pointed star is on a cherub's head. – In the back of the garden is a large pole style dial with boxwood hour markers.
Over lunch, member Holman showed a small, latitude adjustable, dial. For 60 degrees latitude it is a horizontal dial with pole style. For lower latitudes, the whole dial is reclined accordingly. Markings say "Troughton & Simms". Who knows more about this?
The Prinsenhof (Groningen city) dial is perhaps the most beautiful of the province, or indeed of the country say some. Its design is from 1730, when it replaced an older dial. The gate that it ornamented was pulled down in 1907; the dial was displayed since 1921 in the garden of the Mineralogical and Geological Institute. Since the fifties, everything is back to original. The dial furniture is extensive. Italian, Babylonian and date lines are described. The Latin superscript means: the past is nothing, the future uncertain, the present variable; be sure you do not lose it, for it is yours only.

Gnomonische woordenlijst
Gnomonic word list

Mention of the Valhonrat work. Entries in all of the eight constituent languages. Translations to 17 languages in an appendix. Tsjechisch= Czech, Duits= German, Nederlands= Dutch, Deens= Danish, Zweeds= Swedish. Today (early December) one Euro approximates one US dollar.

Grote zonnewijzer op Place de la Concorde, Parijs
Large sundial on Place de la Concorde, Paris, France

On this Place, there is a 32 meters tall obelisk (about 100 ft). In 1913, astronomer Flammarion wanted to make a sundial around it, but this did not happen because of WW 1. In 1939, there was another try, but then WW 2 thwarted the attempt. Paris' Mayor Jean Tibiri has now, in 1999, succeeded and a pattern of lines is actually drawn. The heavy Paris traffic makes it not without danger to read this dial. The dial will exist until 2001.

The Hague Municipal Museum underwent extensive restoration, on the occasion of which a book on its history was published. The book mentions Mrs. Dr. Truus van Cittert, who was one of the three founders of the Dutch Sundial Society. She wrote a treatise on the illumination of the Museum.

[In 99.1, René Vinck wrote a Re: Is the Sun in the wrong place? In 99.2, both Hans de Rijk and Jan Kragten disagree strongly with Mr. Vinck's article. Hans thinks the figures are misleading: one is a top view, the other a side view. Jan's reaction is more detailed. And both point out that the effect (the terminator seems not to be at right angles to the moon-sun line) is *not* negligible at first and last quarters but almost maximum, *and* is in the opposite direction.]

In this article, the author explains that he was wrong and Mr. Vinck was right, and shows how the optical illusion that fooled him comes about. Martin Hugenholtz put him on the right track. When he looks down upon the ecliptic plane (assuming the moon to be in that plane), it all falls into place. The terminator axis is always at right angles to the ecliptic and points toward the ecliptic pole in Draco (between π and ζ). When the moon is crescent or gibbous, it is on a "tilted" part of the ecliptic. The author concludes that he and Hans de Rijk were wrong, and René Vinck is right. But there is more.
The Moondance (B 90.3 p28) describes how the ecliptic tilt depends on season and on time of day. This explains why the crescent moon in the middle of June looked "down" a lot less than in the Vinck drawing. On 21 June the ecliptic top is 30° over the horizon, but on 1 May, this was 50°.
Prof. Minnaert once wrote "fix the sun-moon direction with the help of a string. Incredible as it may seem, you will find the terminator is perpendicular to this". Jean Meeus suggests the use of a broomstick. The author has not had much luck with either of these methods; his eyes fix on a small part of the celestial globe.
C. de Jager suggests a **beautiful experiment**: when you can see sun and moon at once, take a ball in your left hand and extend your left arm towards the moon. When the sun shines on the ball, you will find the terminator on the ball is parallel to that on the moon!

10 Een bijzondere zonnewijzer M. Hugenholtz
A special sundial
The author describes a memorial sundial he calculated. The dial is direct South vertical, but the dial face is a hollow spherical segment. One figure and two photographs.

12 Der Terminator auf der Erde A. Zenkert
The Terminator on Earth in relation to Sunrise and Sunset (German text)
"All location on the same meridian have noon, sunrise and sunset simultaneously". The author argues that this oft-heard statement only holds true on the equinox dates, because the terminator will generally slant. This causes the times of sunset and sunrise to depend on latitude as well as longitude. The author gives some examples. Then he explains the use of a true-angle stereographic projection network, the Wulff Grid. Using more examples, the author discusses several classes of calculations that can be performed using this grid: -duration of day and night; which locations are on the terminator at a specified instant; -which locations share sunrise or sunset.

16 Het millenniumprobleem en het andere millenniumprobleem J.A.F. de Rijk
The Millennium Problem...
A short description of three well-known possible mechanisms for millennium related failures. And:
The Other Millennium Problem
A discussion of whether the new century begins with the year 2000 or with the year 2001. The author explains why a complete millennium has to include the year 2000, making 2001 the start of the next one. Still, century celebrations have always taken place at the beginning of years ending in 00; even the Catholic Church always did. The author also notes our common use of "0 hours" where we have no, say, "0 September". But in:
17 En hoe vreemd is onze urentelling dan wel? F.J. de Vries
How strange is our hour-counting really?
Fer de Vries notes that, apart from the 24-hour system, we have the two times 1 through 12 system. Here, we accept 12:00 midnight and 12:00 noon as boundaries, but the counting does not change until we go from 12:59 to 1:00. And even this system we know how to apply, faultlessly, in our daily lives.

18 Constructie zonnewijzer mbv. Romeinse Landmeter probleem F.J. de Vries
Sundial construction based on the Roman Surveyor's Problem
From B 98.2 p08 we read: "At three arbitrary times on an arbitrary day we record on the ground the shadow of one certain point. This will be all the data we start with. From this we can find the East-West line, the Equator plane and, from that, the altitude of the pole, i.e. the latitude. And because we may now construct an equatorial sundial and orient it correctly, we also know, in retrospect, the times (in local apparent time) of the three observations." This method offers even more possibilities. Author Fer de Vries describes a construction based on an article by Yvon Masse, "Comment tracer un cadran solaire incliné et déclinant à l'aide de trois observations d'ombres inégales" (How to construct an inclining and declining sundial with the help of three observations on unequal shadows).
For the experiment, the author constructed a dial on a surface of 15° inclination and 20° declination. Three calculated shadow points were used as input for the "Surveyor's" based construction: Construct a sundial on a surface of unknown inclination and declination, using only a gnomon of length g, a try-square, a plummet, a tape measure, drawing implements and a sunny day.

Fig. 1 shows three shadows PA, PB, PC. (P is the gnomon foot). M is the point vertically under the gnomon top T. (M will be a point on the XII line.) For clarity, fig. 2 shows three separate drawings. Subtract TB from TA and TC, giving G and H. Vertical projection gives us I and K on PA and PC. In fig. 3, points I and K are added to fig. 1 and line IK is drawn. Draw lines IJ of length GI, and KL of length KH at right angles to IK and to the same side. The intersection of the extensions of IK and line JL is point N.
The line through N and shadow point B is now parallel to the equinox line of our sundial. A perpendicular on this line through gnomon foot P is the substyle of the dial.
In fig. 4 some data from fig. 3 are copied, and a perpendicular on the substyle is drawn PT (the gnomon length). The author now chooses point K to continue the construction because KH is longer than GI. From K, drop a perpendicular on the substyle, giving point Q. Mark of QS of length KH (=KL). Point R is the intersection of line NB and the substyle. Extend line RS as necessary and drop a perpendicular on it from T. This will intersect the substyle in point U. *Point U will be the centre of the sundial, where all hour lines cross.*
Draw a perpendicular on TU, through T, intersecting the substyle in point V. The line through V and parallel to NB is our definitive equinox line. *Triangle UTP is the style triangle*, which will be turned upright around the substyle, so that UT will be the pole style of our sundial.
In fig. 5, the construction of the sundial is finished using conventional techniques. The author found that the result was equal to the test sundial from which he took his three test points.

21 Zeeuwse boerenerven
Zeeland farms
Draught horses in front of Stone Farm (Geersdijk) around 1930. Note the sundial; it was restored in 1991.

22 Polyeder met 25 zonnewijzers F.J. de Vries
Polyhedron with 25 sundials
Among the dials in the Sundial Garden of the Deutsches Museum (München), one is based on a cube with sides $1+\sqrt{2}$. The edges are then bevelled off until the square faces have sides of 1. There are now 18 squares and 8 equilateral triangles. Mounting the polyhedron on the bottom face leaves with 25 to construct sundials on.
For a latitude of 45°, we find that the top north face and the bottom south face are equatorial planes; the top south face and the bottom north face are polar planes. What is more, the triangular top southeast and southwest faces, as well as the triangular bottom northeast and northwest faces, are also polar planes.
In fact, the München dial was constructed for latitude 48°08', not 45°. The author calculated the polyhedron for his own local latitude of 51.5° (Eindhoven). It becomes a lot less regular, as can be seen in the figure. The result is that all faces retain their horizontal, vertical, equatorial or polar properties. Note that this adaptation from 45° to local latitude is not always possible; near 20 or 70° no horizontal face is left over!
[Note of summariser: I have been there too, and I find the Sundial Garden a most enjoyable display. Please go and see it if you have a chance at all.]

30 Stand van de aardas niet constant J.A. Sassenburg
Earth axis attitude in space variable
A theory that at one time there may have been more than 54 degrees between the planes of the ecliptic and the equator. This would explain gletscher phenomena in tropical zones. Practically, it may mean redesigning sundials that are meant to last a while.

31 Tempus Rerum Imperator J.T.H.C. Schepman
"Time is the ruler of all things"
A description of a silver diptych of approx. 1" square. The curator of the Rotterdam Maritime Museum was quite enthusiastic and advised the owner to show it to their Amsterdam counterpart. Reception was cooler here: the item was thought to be mass-produced. A TV art program valued it more and even put a price on it. Not bad for € 0.15 at the Middelburg school rummage sale.

32 Kunst en Cultuur: Van Tijd tot Tijd TeleacNot
Culture and the Arts: "From Time to Time"
PSB Teleac-NOT will air a series of 12 15-minute parts on aspects of Time. Quite possibly, sundials will be discussed; at least the programme flyer shows the Prinsenhof dial.

32 Tagung van de Arbeitskreis Sonnenuhren W. Coenen
Arbeitskreis Sonnenuhren congress
Among 80 participants, the author was the sole representative for the Dutch Sundial Society. From the subjects:
- - Peter Rick on a student project. Students made a Roman scaphe. - Rudolf Losel on Regiomontanus'

quadrant. Losel argues that the Peuerbach formula is incorrect and puts forward a better one. – Possibility to tender towards some books from the Martin Bernhardt estate. The 2000 Tagung will be in the city of Bielefeld.

33 Zonnewijzers in Nederland W. Coenen
Sundials in The Netherlands
Eenrum – A double dial, placed there 5 June and unveiled by the Mayor of Eenrum 12 June. The South- and Westdial are dubbed Castor and Pollux. They were designed and made by our member E. Roebroeck.
Groningen 15 – A sturdy vertical east-decliner, approx. 80"×40". Roman numerals VII-III (15) in wide blue band, small hour lines. Fleur-de-lis like figures for half-hours. Bottom left "DST + 1 hour", bottom right "NZ time + 12 hours". Motto: "What time does not solve is not a problem".
Leusden – "'t Hamersveld" lawn: a new armillosphere by Mr. D. Lent, technical assistance by member G. Sasbrink. 28" rings, forged not onto, but into one another. Equator and accessory bands are painted white with Roman numerals on a narrower black band. The hour band is adjustable and at the time of writing showed DST.
The dial was unveiled on 26 May by Mrs. Zeeman, former director of the home, assisted by Mrs. Hoksbergen, former head of the medical staff. Present were Mr. and Mrs. Lems, members of the board, staff and residents.

35 Literatuur 1334 t/m 1350 D. Verschuuren
Literature
1334 A standard work on the astrolabe: "History, theory and practice of the Astrolabe" by Raymond D'Hollander; with publishers' details. **1337.1** Deux cadrans analemmatiques à heure légale par Yvon Massé: two solutions to provide an analemmic sundial with an EOT figure-of-8. **1337.4** Gnomon et précision: error discussion concerning gnomon height on horizontal dials without pole style. **1343.5** Ancora sulle ore canoniche, temporarie e planetarie da Nicola Severino: View on canonical, unequal and planetary hours and historical material for illustration.
There are many interesting titles from English-language journals- I skipped those for obvious reasons.

Ledenlijst
Members list of De Zonnewijzerkring. With telephone numbers.