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Conical sundial with Italian and Babylonian hour lines (cont.) *F.J. de Vries* *12*
The Genk Sundial Park has a realisation of Spanish Javier Moreno Bores' idea for such a sundial. Fig. 1 shows the dial in principle. One property of such a dial is that the Italian and Babylonian hours are read on a shadow line, instead of just a shadow point as in ordinary point dials. I and B lines are obtained by the rotation of the horizontal plane about the polar axis. After every 15 degrees, the intersection between the rotated plane and the dial face forms the next hour line. The rotating plane described a cone, which consists of two halves, both of which are useable as shadow casters. Fig. 2c shows the lower half used with an inclined southing face.
Riccardo Anselmi of Italy realised that the tip of the cone does not have to be in the plane of the dial face. In fig.4, it looks as if the cone is placed on top of a gnomon. This enables one to construct the hour lines on the dial face as if for an ordinary point dial. Because at the winter solstice the two shadow line of the cone will be outside the pattern, it is useful to extend the hour lines.
Trying this for cones for lower latitudes, it becomes clear that the extended hour lines are all tangent to an ellipse, shown in fig. 6, or to a parabola or hyperbole, depending on latitude and dial face orientation. – The conical gnomon can also be used for sidereal time. Hour lines are obtained by rotating the plane of the ecliptic around the polar axis. The apex will always be 133 degrees, independent on latitude (fig.7 was missing). This should make it simple to make a universal sidereal time dial.

A sundial in a cigar box *J.A.F. de Rijk* *16*
A box and two pieces of sewing thread make a point dial. Because the box projects the sky upside-down on its inside, the dial face (with furniture calculated by Fer de Vries) shows an upside-down version of the typical Dutch landscape.

Erratum: Elliptical arcs *A. van den Beld* *17*
This is a correction to a twenty-year old paper on the length of an elliptical arc. The top formula is wrong, the bottom one, starting *boog CP =*, is correct. Note that the integral cannot be solved analytically, only approximated numerically. The author suggests the trapezoid rule.

An inverted sundial *W. Geerts* *18*
Wim Geerts built a bird feeder with three date lines and hourly analemmas etched on the inside of the glass roof, and a readout dot on the floor. He calculated the patterns with a homebrew Pascal program.

R.L. Adzema receives second Sawyer Prize *D. Verschuuren* *20*

A good overview of his sundials. A description of the Sawyer Prize ceremony is on sundials.org/conference/2001/2001conf.htm

Postcard dial by Sundialfactory *H. Hollander* *22*
This elaborate sundial, once finished, shows local time, date lines, and longitude+EOT corrections.

A new Sundial on Utrecht Dom Tower *J.A.F. de Rijk* *23*
Why do neither the Dom Tower nor the Cathedral have a sundial? The dark red dial with golden hour lines of St.Nicholas catches the eye immediately, and the Jacobi church even has two.
Dom Tower did have sundials. A drawing shows the 1525 situation, with a large style triangle near the Egmond chapel. A century later, in 1626, it must have been missing, for the town council ordered sundials to be placed on several buildings, among them the Dom Tower.
This dial did not survive either, and the 1838 model of the tower (now in Central Museum) by L. Koentz shows a small horizontal dial near the Egmond chapel. It was invisible from below. Probably this dial was last seen in 1966, but it vanished without trace.
A widespread misconception is that citizens read time on the sundial. They did not; they had the tower clock – which the tower keeper set to the sundial. A small dial was all that was necessary; but in many cases, if you were going to add a sundial to your church, it might as well be a nice one. They were difficult to maintain, however, and the Dom Tower reverted to just a small dial for the keeper.
Whether a large vertical, or a smaller horizontal dial is not yet decided, but this much is certain: In 2003, the Dom Tower will have a sundial once more.

Conical sundial or elliptical cylinder sundial? *F. J. de Vries* *24*

Manuel Lombardero and Manuel Valdés of Spain, and Manfred Hüttig of Germany, think that some antique so-called conical sundials may not be conical in shape, but that the stone is cut along a cylinder with elliptical cross section. They tend to add a new class: that of the elliptical-cylinder dials.
Properties of the "usual" conical dials are:
The axis of the cone is parallel to the earth's axis (φ); the apex is free (2ε); the intersection of the cut-out with the equatorial plane is a circle; the intersection of the cut-out with the horizontal plane is an ellipse (ε<φ), a parabola (ε=φ), or a hyperbole (ε>φ), but never a circle; and the surface of the cut-out is straight like the mantle of a cone is straight: you could glue saté sticks to the surface, and they would all point towards the top of the cone. Especially the last three properties are easily checked, but this is hardly done. Gibbs mentions it only once, for the Leiden dial.
The three researchers measured two "conical" dials and found that not only the rim in the equator plane was circular, but that in the horizontal plane as well. This does not fit the description of a cone. Further checking with a sheet of paper showed that its edges remained parallel when it was pressed into the cutout, indicating a cylinder and not a cone.
If a cylinder is to intersect two (non-parallel) planes along two circles, it must itself have an elliptical cross section and make an angle of 45º+0.5φ with the horizontal. Saté sticks glued to the surface would now all be parallel.
In practice, a stone would have an equatorial and a horizontal face. Equal semicircles would be drawn on the line where the faces meet, with each semicircle divided in equal parts. Now the mason would chisel away the stone so that straight lines would connect corresponding points on the semicircles. The resulting shape would be fitted with a gnomon, such that on the longest day, the shadow of the gnomon just reaches the lower semicircle. Dividing this arc in twelve parts gave the 11 hour points for the antique unequal hours. The same was done with the arcs for the equinoxes and the shortest day.

Time types and names *G. Strang van Hees* *28*
The author has reservations about use of the expression "true time" for apparent time. Accepting the definition for the second as unit of time, we note that apparent, or solar, time is quit irregular, and can hardly be called true. There are philosophical difficulties with this word as well; is there a non-true time? Actual time seems to the author a better way of describing the position of the sun in the sky.
Likewise, use of the expression "civil time" should be discouraged in favour of, for instance, MET.

Spar dial *F.J. de Vries* *30*
The spar dial is an idea of W.S. Maddux, published in Compendium, March 2002. In short, three guy wires hold up a spar. One of the guys is also pole style. A second spar, tied perpendicular to the pole guy and beneath it, carries the hour marks. Because of this particular construction, corrections for longitude, EOT and DST are easy. If one horizontal spar is not enough, we can tie in another one, so approximating a circular hour band more completely.

Literature *D. Verschuuren* *34*
My time precluded perusal of all the entries here. I will have to postpone this to the next Bulletin.

Equatorial dial with conical gnomon *Fabio Savian* *42*
The width of the shadow indicates by how many hours the day arc is longer than 12 hours. In the example, the day arc would be about 12+2=14 hours.