Re: Shadow of sundial a straight line on equinox day?

Source: http://sci.tech−archive.net/Archive/sci.astro.amateur/2009−03/msg01183.html

- *From*: brian@xxxxxxxxxxxx (Brian Tung)

- *Date*: Sat, 28 Mar 2009 18:19:04 −0700 (PDT)

Kurt <canopus56@xxxxxxxxx> wrote:

> This is because of the extreme distance of the Sun, all rays from the
> Sun appear to fall in parallel lines at all points in on the Earth's
> globe. At the equinoxes, the rays of the Sun aer parallel to the
> lines of latitude and the equator. Hence, the Sun's shadow traces a
> straight line. At other times of the year, the Sun's rays are at an
> angle to the lines of latitude, hence, the Sun's shadow from a gnomon
> does not trace a straight line − it traces a parabola.

It's only a parabola if the surface of the sundial is coplanar with the
north celestial pole, since this is the axis of the cone generated by
the gnomon's tip and the path of the Sun (to first order, ignoring the
variation in declination of the Sun over the course of a day). Some
sundials are in fact mounted this way. In all other cases, the path is
a hyperbola. The asymptotes of the hyperbola are the lines drawn from
the gnomon to the rising and setting Sun. At the equinoxes, these
asymptotes are both identical to the east−west line, and the hyperbola
degenerates into a straight line.

−−
Brian Tung <brian@xxxxxxxxxxxx>
The Astronomy Corner moved to http://www.astronomycorner.net/
Unofficial C5+ Home Page at http://www.astronomycorner.net/c5plus/
The PleiadAtlas Home Page at http://www.astronomycorner.net/pleiadatlas/
My Own Personal FAQ (SAA) at http://www.astronomycorner.net/reference/faq.html
.