Bearing-dials and mapping Vinland.

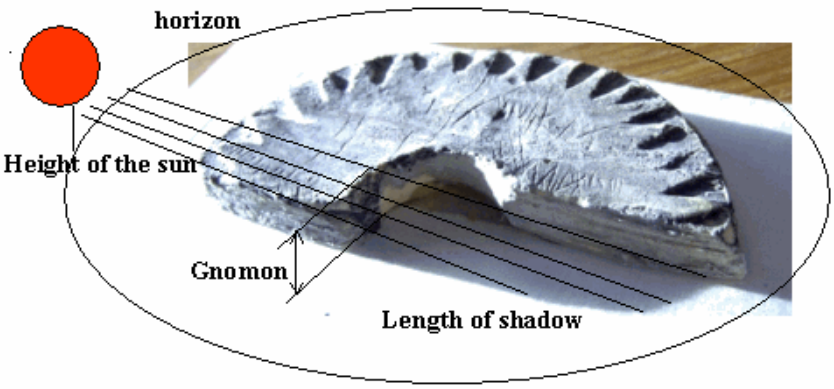
© Erik Torpegaard, 28/7/2006,3.udg.

Abstract: C.L.Vebaeks find of a bearing-dial from the Eastern Settlement in Greenland and how the Norse used it for mapping Vinland around 1000AD:

My hypothesis is stated on my website: www.etimage.com and will be as follows:

The bearing-dial (fig.1) is complete as it is found, not broken, and the shadow thrown from the inner edge (gnomon) at noon during the seasons is used for measuring the height of the sun observed from a given latitude and meridian. The height of the sun is followed from the meridian connecting the homeport and the destination and from parallels to this meridian finding some sort of "longitude", based on "eykt-measurement (45 degrees from south or 3 hours from noon). A meridian connecting the homeport and the destination port will be drawn on the point of amplitude for sunrise or sunset calibrated at winter-solstice or summer-solstice on the same latitude.

Fig.1 Bearing the sun – height and amplitude



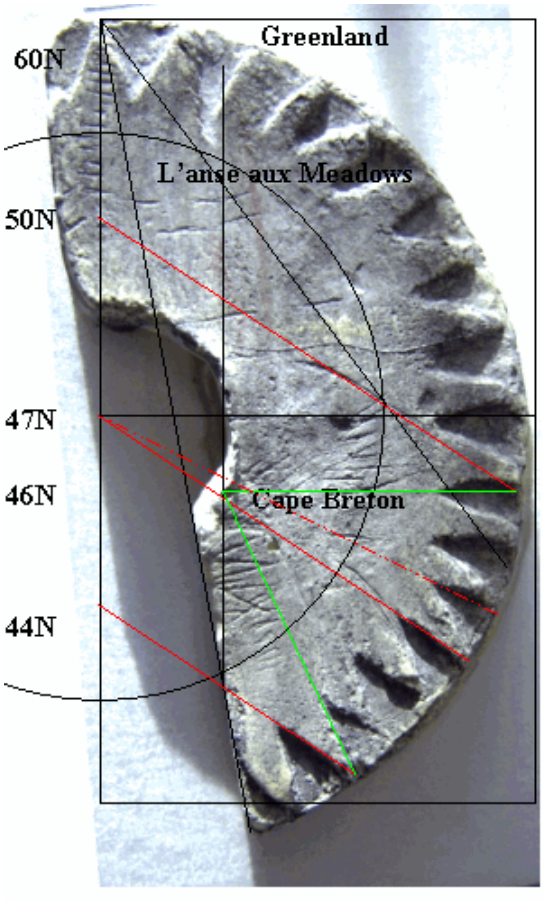


Fig.2 Mapping Vinland

When measuring the height of the sun ("altitude") on known meridians (and amplitudes) during the journey, the Vikings had a pretty good knowledge about there position (latitude and meridian (longitude)). The Vikings constructed a special curve on the bearing-dial which Thirslund and Roslund called a gnomon-curve for summer-solstice. But this special curve isn't an ordinary gnomon-curve with centre as suggested by them, and it can never be. As mentioned the Vikings were drawing parallel lines to the meridian over the amplitude for given latitude and the special curve for summer-solstice on the bearing-dial fig.2 could then look like a parallel gnomon-curve to the centre, but it will never be a curve created by a gnomon in the centre. If the Vikings knew the latitude from the North Star and they knew the height of the sun on the destination port during the seasons, they could go for the meridian directly just with help from the bearing-dial measuring the height of the sun during the journey.

Constructing the bearing-dial is much more complex than suggested by Thirslund and Roslund and my simulations and the geographically information drawn

directly on the dial are showing a centreline latitude around 47N and a meridian and parallels around North Cape on Prince Edwards Island, Cape Breton and eastwards against Avalon. Fig.3 shows the meridians used over the amplitude.

A simulation on alternate finds of bearing-dials from Greenland (60N) and Denmark (55N) supports my hypothesis.

During the last two years a lot of scholars have investigated my website (esp. Inger E Johansson, Simon Pugh, Eric Stevens etc.). My comments below are especially for them.

The bearing-dial is complete as it is, but could be used on top of a wooden plate described in ref.1, fig 84. This plate showing a wheel cart is C-14 dated to around 1000AD. The plate and the dial are probably used when the Vikings got ashore, which means the bearing-dial is constructed ashore, but also used when sailing.

The Gnomon is the edge of the inner-circle representing latitude around 45N, and the shadow length (tan(v)) shown in fig.3 represents sun height at 56N, around 10 degrees at winter solstice at noon. It doesn't mean they have sailed at winter, but they have calibrated the bearing-dial with sun heights from both summer and winter solstices at latitudes from 60N to 45N (both ways). The shadow thrown at 60N winter will just touch the outer circle shown in fig.3.

Ref.1: Man & Society 14. 1991, C.L:Vebaek

Ref.2: Vikings in Sop's Arm, 2006, Kent Budden and Erik Torpegaard