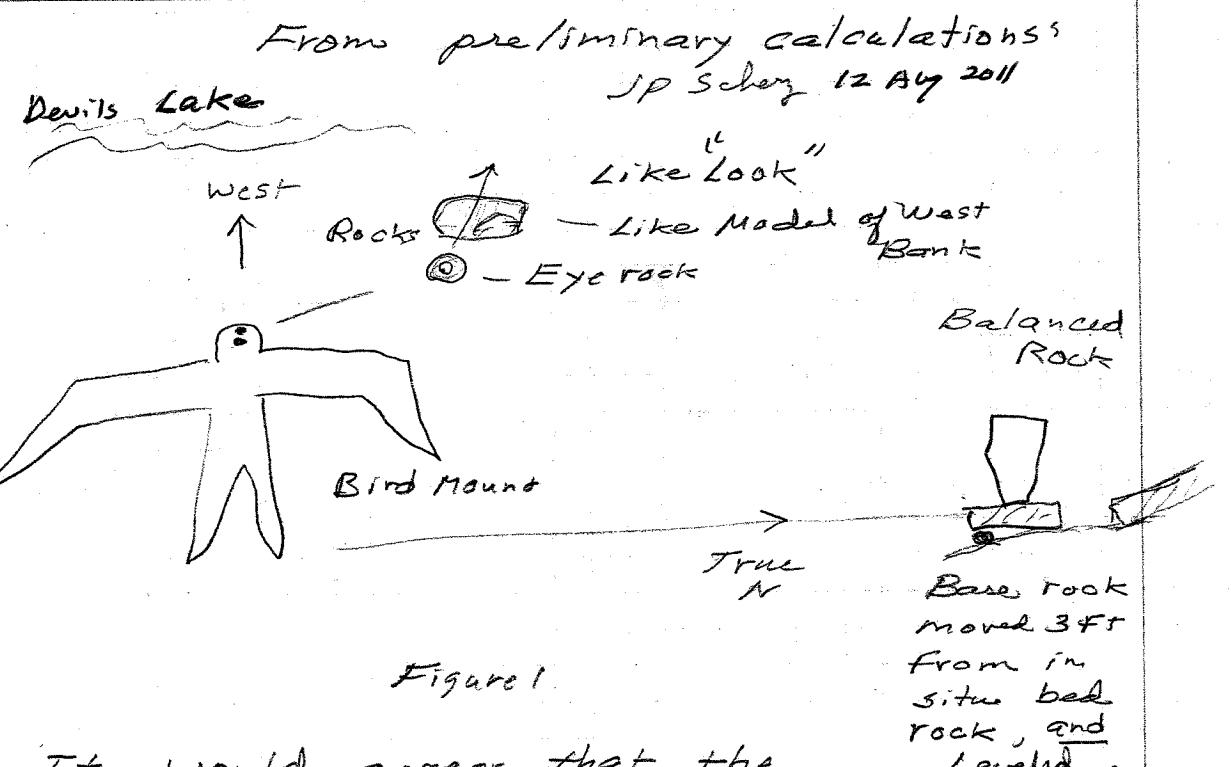


Working Paper 12 Aug 2011  
Bird Mound at Devil's Lake and Calendars ①



It would appear that the bird mound was meant to be connected to the balanced rock directly north of it, which is clearly visible when the area is free of vegetation. Marker trees (deformed trees) north and east of the Bird Mound leads one to Devil's Doorway, where we can find calendar function to the summer solstice and spring and fall cross quarter days (Ground Hog's Day and Halloween). Other deformed trees on the East Bluff draw attention to the area of the Bird Mound and to something on the West Bluff.

As Balanced Rock and Devil's Doorway are two prominent features on the East Bluff, so also Cleopatra's Needle and Turk's Head are two prominent features on the West Bank. They would have also been considered important in ancient times. They both can be seen from the bird mound, even after vegetation has come in the summer.

Two rocks placed on the Bird's Head also draw one's attention to the west Bluff to the Northwest. Along the trail on the west side of the lake, one sees rather recent marker trees. One points west to where you see Turk's Head perched atop the cliff over head. The other points southeastward to the area of the Bird Mound.

As we have demonstrated and photographed the solar calendar function at Devil's Poorway, we might <sup>suspect</sup> similar calendar function between the Bird Mound, Cleopatra's Needle and Turk's Head. But there are two possible long range forward points which we could use; this suggests calendar function for both the sun and a planet. The most likely planet is Venus. The northernmost set of Venus shows up at several sites along with the northernmost set of the sun. Figure 2 shows some examples. The northern-most set of Venus occurs once each 8.000 solar years when Venus is closest to the earth. It last occurred on about 4 May, 2004 and will occur again about 4 May 2012. You should not miss it.

So important was the 8 year Venus cycle in the New World, that in Mexico it was called the Venus/Solar Calendar before missionaries burned the written books (codices).

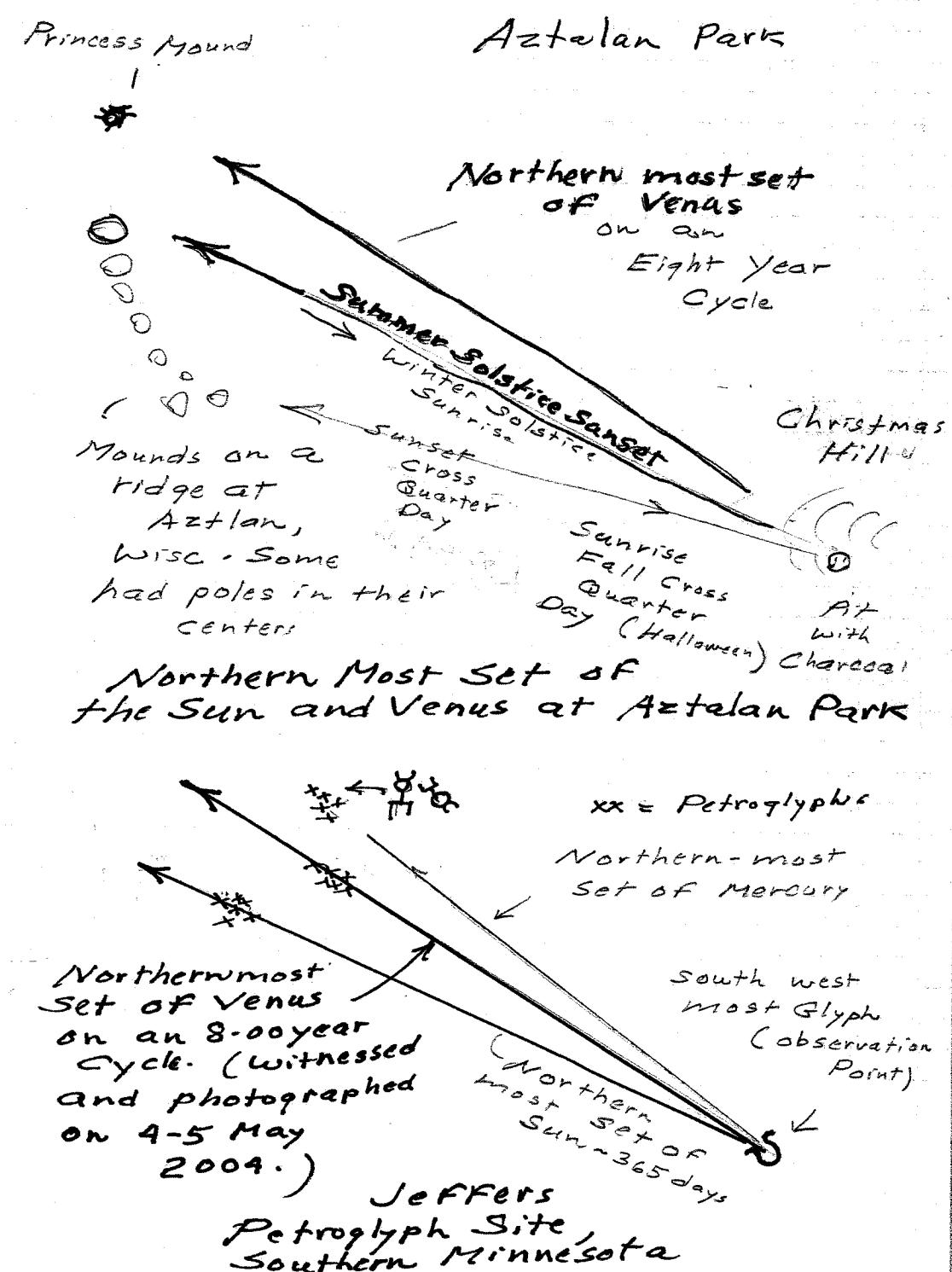


Figure 2. Northernmost Sets of the Sun and Venus at two example locations.

3

### What we have witnessed from The Bird Mound

Near the summer solstice of 2011, we witnessed and photographed the setting sun from the bird mound at Devil's Lake.

**Sunset with observer at head of Bird Md.**

**Sunset with observer at CN, crook of northern wing.**

$2.00^\circ$

$2.396^\circ$

Turks Head

Cleopetria's Needle

TMI and T7 are two identifiable tree patterns, which were later surveyed with the instrument near the head of the Bird Mound.

The horizontal angle was measured as  $2.00^\circ$ .

50 paces  $\rightarrow$  30 paces

Head of Bird Mnd.

CN

$\sim 80\text{ft}$  to  $90\text{ft}$

(Need to get precise distance)

N

By the observer moving about 80 ft from Head of Bird mound to CN, the setting sun on the western horizon shifts  $2^\circ$ . The shift rate is about  $2^\circ$  in 80 ft or  $1^\circ$  in 40.

\* The best photographs, by far, were taken by Linda Meadowcroft.

4

### What we Expect at this time:

We witnessed and photographed that if an observer today watched the summer Solstice Sun set on line to Cleopatra's Needle, then he or she would have to stand near CN, the northern crook of the north wing. Even when the mounds were built when the maximum declination of the Sun was near  $23.75^\circ$  (and not  $23.4^\circ$  as it is today) the observer would still have to be on the north wing, albeit about 24 ft south of the crook.

The prominent Turks Head is about  $2.4^\circ$  north of Cleopatra's Needle, so it can not work into any alignment to the setting sun from an observer on the Bird Mound. The next best alternative is the planet Venus, which we will next examine.

Whereas the northern most declination of the sun today is  $+23.4^\circ$ , that of Venus is about  $27.8^\circ$ . If we solve for what I call the  $\beta$  angle (from true west) for these two heavenly bodies (For flat terrain) we have

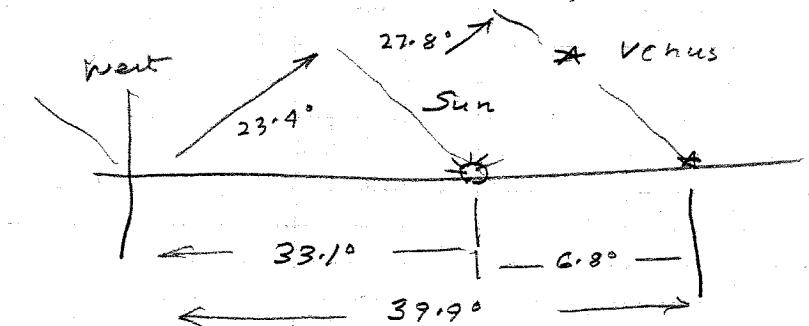
$$\sin \beta_{\text{Sun}} = \frac{\sin d}{\cos \text{Lat}} = \frac{\sin 23.4^\circ}{\cos 43.42^\circ}$$

$$\beta_{\text{Sun}} = 33.1^\circ$$

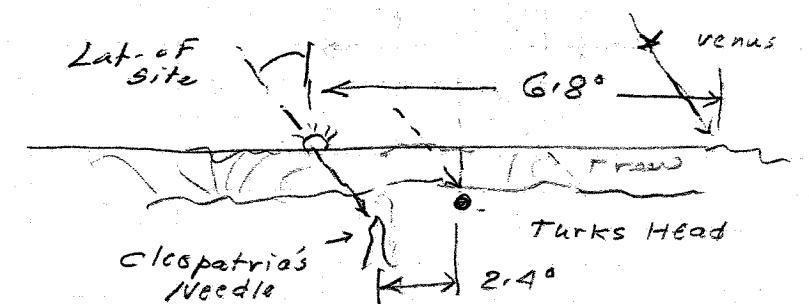
$$\sin \beta_{\text{Venus}} = \frac{\sin 27.8^\circ}{\cos 43.42^\circ}$$

$$\beta_{\text{Venus}} = 39.9^\circ$$

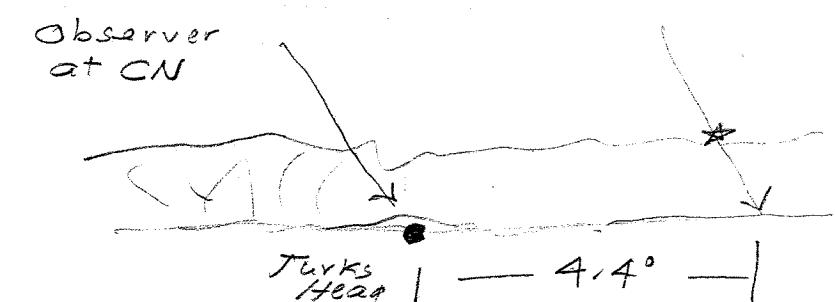
so looking west on a flat horizon to the northern most set of the sun and venus, we have



According to these calculations, Venus could be expected to set about  $6.8^\circ$  north of where the sun would set on the summer solstice.

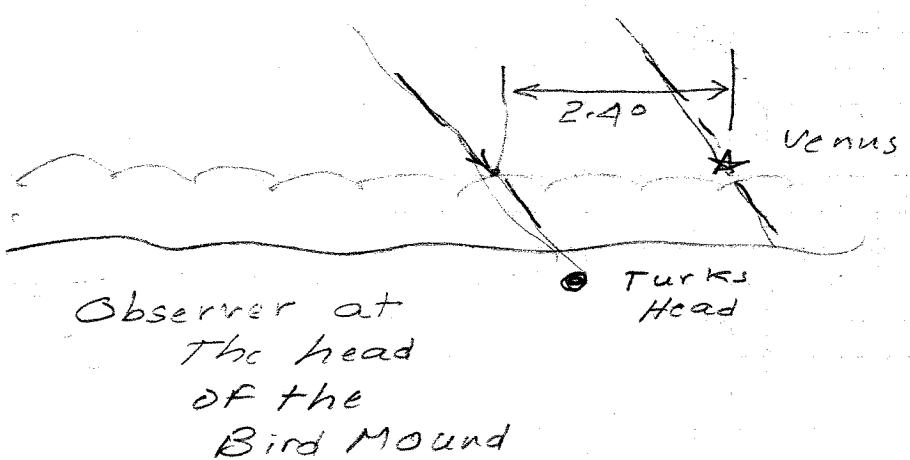


With an observer at CN or at the crook of the Northern Wing, he or she would see the above. Venus would set about  $6.8^\circ$  north of a line descending to Cleopatra's Needle. But Turks Head is  $2.4^\circ$  North of Cleopatra's Needle. Consequently, we could expect Venus to set  $6.8^\circ - 2.4^\circ = 4.4^\circ$  north of a line to Turks Head.



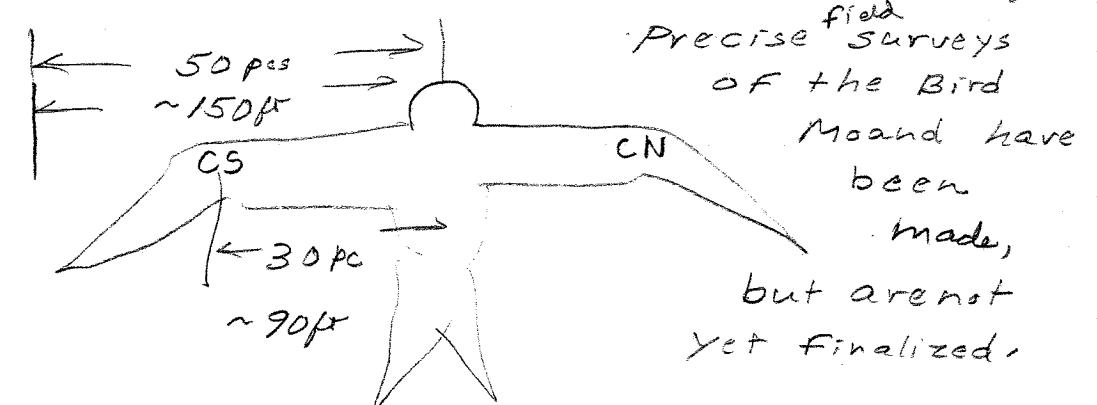
Since the place where Venus will appear to set on line to Turk's Head is too far north, it follows that the observer will have to move south along the wings of the Bird Mound to find a place where Venus would set through the trees in line with Turk's Head.

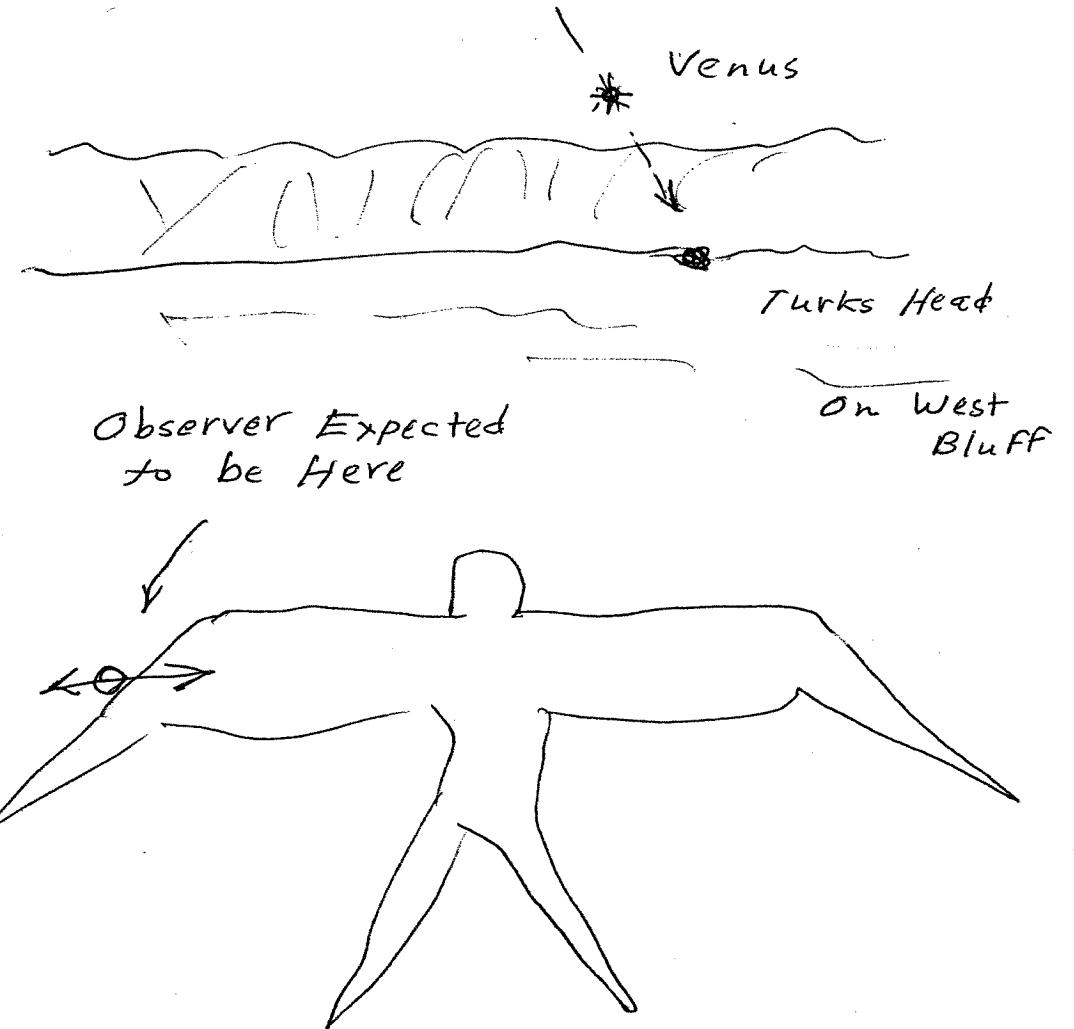
The observer near the summer solstice had to move about 80ft north from the head of the bird mound to the crook of the northern wing (Point CN) to shift where the sun hit the western horizon. This shift along the tops of the trees on the western horizon was surveyed to be  $2.00^\circ$ . Consequently, if the observer moved south back from CN to the head of the Bird Mound, we would expect Venus to now set  $4.4 - 2^\circ = 2.4^\circ$  north of a line to Turk's Head.



Naturally, we could move farther south from the head of the Bird mound and find a point where Venus would appear to set on a line to Turk's Head (as we were forced to move north from the head of the Bird Mound to find a place where the setting sun would set in line to Cleopatra's Needle.)

As shown, the expected shift in angle on the horizon per distance moved is  $1^\circ$  per 40 ft. If this is all correct, we would expect to move  $2.4^\circ$  or  $2.4 \times 40 = 96$  ft. Given the crude paced distances below, we would expect this point to be some where between the crook of the Southern wing (CS) and the end of the Southern wing.





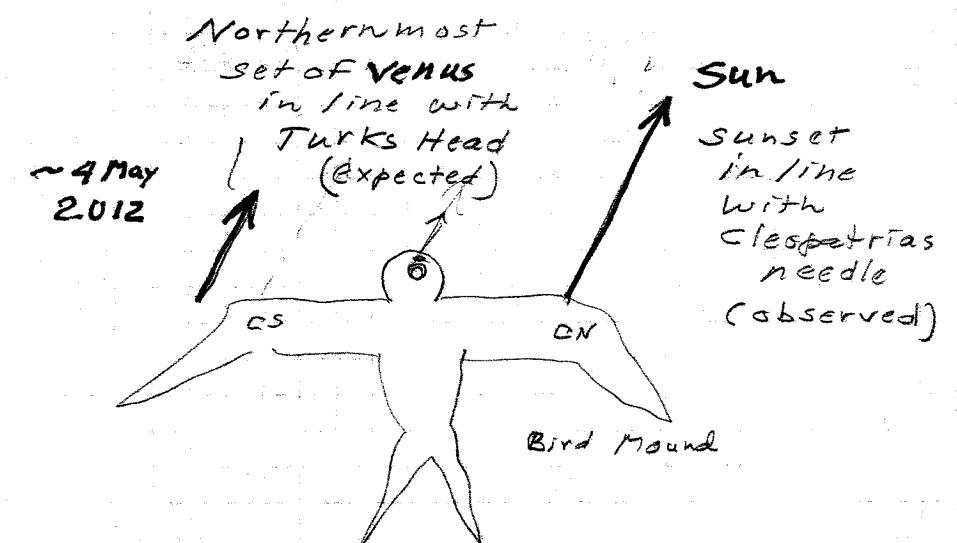
what is expected. Better survey data is yet to be analyzed. A final field check is planned for about 4-5 May, 2012, when Venus will be at its most brilliance and at northern-most set.

9

### In Summary

we have witnessed the setting sun on line through the trees to Cleopatra's Needle, when the observer is near the crook of the Northern wing-

we expect that the spectacular northern-most set of Venus will be in line with Turks Head, when the observer is located between the crook of the Southern wing and the end of this wing. This will happen about 4-5 May 2012. You will not want to miss it. \*



whether observing the setting sun against the sunlight, when Cleopatra's needle is obscured from the glare, or whether observing Turks Head after dark, these objects themselves are not visible at the moment of set. Identifiable features (tree patterns) on the horizon must be used. Perhaps a light on Turks Head can be used like a fire in ancient times.

10

