**Description of the Moon’s movements**

The moon’s orbit and its apparent movement as seen from earth is not simple. A detailed explanation is available elsewhere (Thom 1971: 15-27; Wood 1978: 66-70**;** Thom A.S. 1981: North 1996: 553-68).

The axis of the Earth is tilted at about 23 ½ degrees. This is termed ‘the obliquity of the ecliptic’, symbol ε. Because of the tilt the declination of the sun changes regularly on an annual basis from about +23 ½ degrees to ̵ 23 ½ degrees (the solstices). The plane of the moon’s orbit round the Earth is inclined at about 5⁰ 8ʹ.7 to the plane of the ecliptic. This plane rotates over a period of 18.6 years. This 5⁰ 8ʹ.7 (symbol ί ) effectively interacts with the Earth’s tilt, so that at the extreme positions the declination of the moon is ε + ί (29⁰ 03ʹ) and about 9 years later ε – ί (18⁰ 45ʹ.6)’

The value of ε changes slowly with time as the Earth’s axis precesses over a 26,000 year period. For the last few thousand years it has been decreasing at a rate of about 0ʹ.7 per century. Thom determined a value of 23⁰ 54ʹ.2 ± 0ʹ.7 for ε from the solstitial sites that he examined (Thom 1971: 36 – 44). By use of the de Sitter formula this yielded a date of about 1700 BC (Thom 1971: 15).

(Note: The solstitial sites used by Thom are open to some doubts but the declination values found for the moon in this study confirm the value for ε found by Thom. See paper **‘Dating of Sites’)**

There is a further important point:- During the time when these extreme declinations occur, the moon is subjected to slightly varying gravitational forces at each successive lunation which has a small effect on its declination. (This results from the inclination of the moon’s orbit, ί. ) Let us consider the extreme north declination position, + 29⁰ 03ʹ. If this varying force did not occur, then the moon’s maximum declination at each lunation would increase slowly and regularly to the maximum value and then slowly decrease again. A plot of the extreme positions would follow a sine curve. This is not what happens. Instead a plot of the moon’s extreme declination follows a small wave of amplitude ± 9ʹ of arc superimposed upon the sine curve. This is termed ‘the lunar perturbation’ or colloquially as the ‘wobble’. (There is no implied suggestion in this term that the moon wobbles.)

These maximum and minimum declinations of the moon are termed the Major and Minor Standstills respectively because the moon’s maximum and minimum declinations vary relatively little over a period of more than a year.