UNITS OF MEASUREMENT IN THE LATE NEOLITHIC

ON THE MOORS AROUND ILKLEY, WEST YORKSHIRE

This paper contains the first of three brief reports from research carried out by Peter Harris and the late Norman Stockdale, in the 1980s and 1990s, on and around the moors above Ilkley, West Yorkshire.

The three papers provide the possible interpretations of: Two Incised Stone Designs on Rombalds Moor, The Distribution of Five Carved Stones on Baildon Moor, and an Interpretation of Backstone Beck Enclosure, Green Crag Slack, Ilkley.

The authors propose that a general unit of length was used in the planning and design of these megalithic projects and in the stone engravings.

The standard unit of length believed to be used was called the Megalithic Foot (MF), it measured 14.142 inches/35.919 cms. It is also believed that the Megalithic Foot (MF) was subdivided into 56 equal parts of 0.2525 inches/0.6414 cms; this unit was called the Megalithic Inch (Mi).

Initially it was felt that an integral part of megalithic designs was to incorporate key and important units of time. With specific reference to the carved rocks on Ilkley Moor, the important astronomical time units are listed and summarized below.

The Lunar Cycle

Regular observation over some years will establish that the moon's extreme rising and setting positions move in and out either side of the sun, taking 18.61 years to complete a cycle.

The Lunar Month (Synodic)

The moon begins its monthly phases on the left-hand side of the sun, taking 13 days to become a full moon. Thirteen days later the moon may be glimpsed only as a tiny crescent on the right side of the sun. The moon then disappears for about 3 days, lost in the glare of the sun. This complete lunar cycle takes 29.53 days.

The Anomalistic Month

This 27.55 days month is defined by the moon's distance from the earth. It is the time it takes for the moon to go from one perigee to the next – the point in the moon's orbit when it is closest to the earth.

The Solar Year

The time taken for the earth to travel once around the sun in 365.25 days. Our present calendar year.

Note. Due to a possible duplication of title with other existing named megalithic measurements/values, the Megalithic Foot (MF) and the Megalithic Inch (Mi), were renamed in 2016 as: the Harris and Stockdale Megalithic Foot (HSMF) and the Harris and Stockdale Megalithic Inch (HSMi).

AN INTERPRETATION OF TWO INCISED STONE DESIGNS ON ROMBALDS MOOR, WEST YORKSHIRE.

Fig 1

Stone SM25388, known as the Swastika Stone (OS grid reference SE 0955 4695), is on a gritstone outcrop on Woodhouse Crag, Rombalds Moor, overlooking the Wharfe Valley, west of Ilkley. The main design is composed of ten incised cups and a figure known as a fylfot or swastika; other cups appear outside this main figure and are not generally considered part of the main figure. I believe, however that they do need to be considered as part of an integral conception. The linear groove makes a "swastika" that encloses five cups; an extension to an almost complete circle encloses a single cup. Four more cups are set within the angles of the fylfot's arms. (See Figs 1, 2, 3).

I have described the proposed measurements of the Megalithic Foot (35.92cms/14.142ins) and its 56 subdivisions of 0.2525ins/0.6414cms, the Megalithic Inch. (MI) Virtually all the stone incisions made in the design of the Swastika Stone use the Megalithic Inch which is dated by archaeologists as having been dated as late Neolithic or Early Bronze Age of the region 2000 years BC.

The fylfot motif

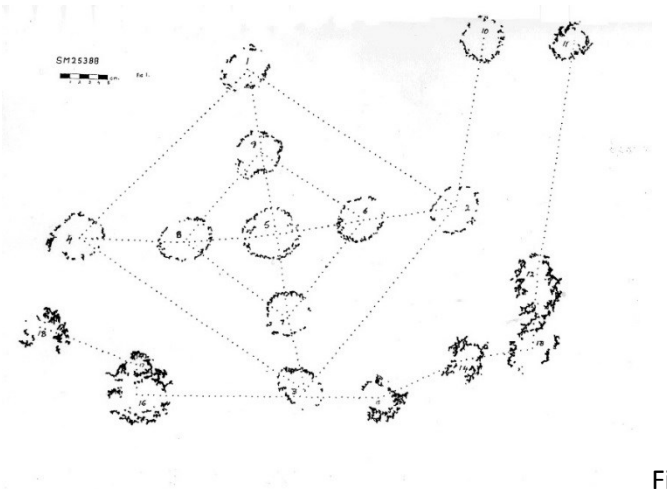


Fig 2

The fylfot design (Fig 3) is made up of two forms, the main "swastika" figure and a sickle-like "tail". The main figure's groove length is 346.62 (MI) i.e. 346.62 days in an eclipse year. The "tail" adds 66.8 (MI) to the composition as it winds around Cup 10.

346.62 (MI) + 66.8 (MI) = 413.42 (MI) 413.42 days = 29.53 (Synodic month days) x 14

413.42 days = 27.55 (Anomalistic month days) x 15

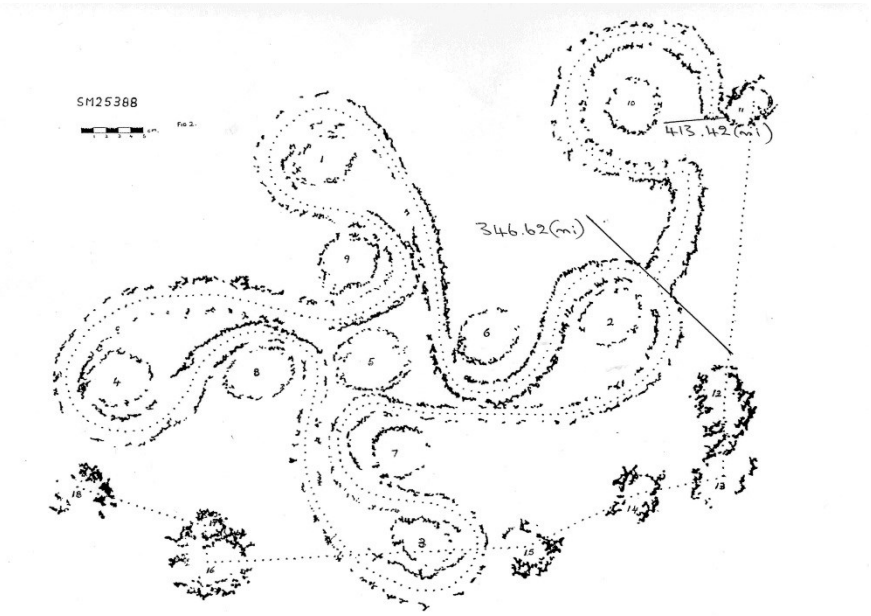


Fig 3

The design of the Swastika Stone allows the unifying of two key astronomical values of time – the eclipse year of 346.62 days with the value of 413.42 days.

Note that the perpendicular of the cup-mark cross = 63.6 (MI) x 6.5 = 413.42 days.

The central “swastika” form essentially consists of two diamond shapes, one inside the other, each with four cups. (See Figs. 3.1 and 3.2).

Feature	**(MI)**	**Explanation**		
Outer perimeter	165.3	Anomalistic month (27.55 days)	x	6
Outer perimeter + outer hollow	192.84	Anomalistic month (27.55 days)	x	7
Inner diamond at centre	82.65	Anomalistic month (27.55 days)	x	3

The figure of a cross, which takes in the central cup, was an addition to the design (See Fig. 3.3)

248 (mi)

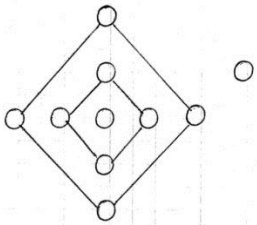
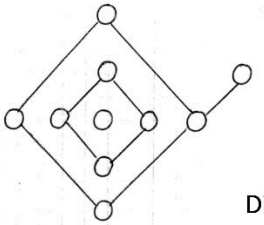


Fig. 3.1

275.5(mi)



Diamonds

Fig. 3.2

144(mi)

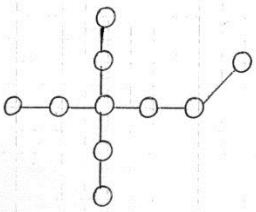


Fig. 3.3

392(mi) or 7(MF)

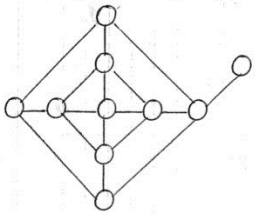


Fig. 3.4

Horizontal to the fifth cup = 27.55 (MI) Anomalistic month

While the Anomalistic month of 27.55 days has dominated the "diamond" cup measurements, we also have the Synodic month of 29.53 days – the key figure that the Swastika Stone "triangles" bring to the fore. (See Fig. 3.5).

398.65(mi)

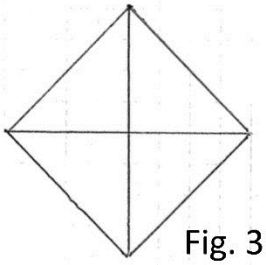


Fig. 3.5a

292.35(mi)

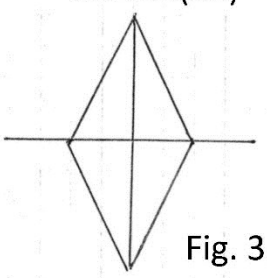


Fig. 3.5b

194.9(mi)

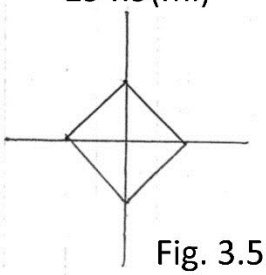


Fig. 3.5c

Triangles

Feature	**(MI)**	**Explanation**
a) Outside Triangle	398.65	Synodic month (29.53 days) x 13.5
b) Middle Triangle	292.35	
c) Small central Triangle (b + c)	487.25	Synodic month (29.53 days) x 16.5
All triangles (a + b + c)	885.9	Synodic month (29.53 days) x 30

Separate from the main design there are eight cups (see Figs 2 and 3), which are not usually considered with the central figure. I believe, however, that they are an integral part of the overall design. These cups have a total linear distance of 139.5(MI)

139.5 (MI) = 18.6 moon cycle x 7.5

Fig 3.6

The linear distance of the eight cups, total 139.5 (MI),
+ total perimeter of triangles 885.9 (MI) = 1025.4 (MI)

1025.4 (MI) = 27.55 (Anomalistic month) x 18.6 (moon cycle) x 2

This thereby unifies the Anomalistic values with the Moon cycle values.

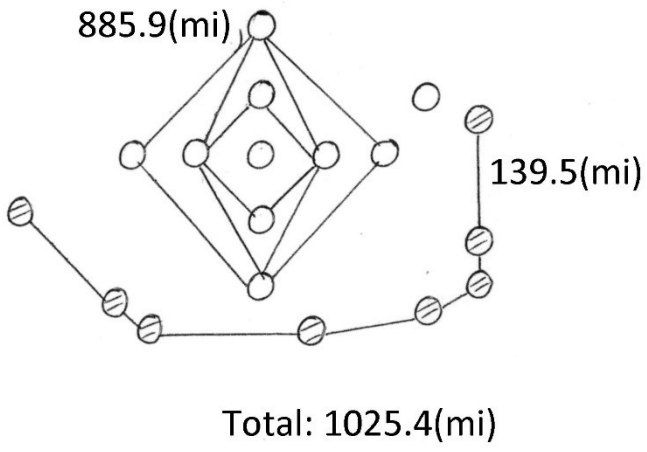
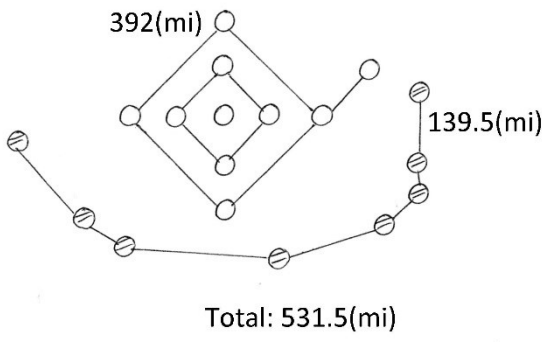


Fig. 3.7

The linear distance of the eight cups, total 139.5 (MI) + total perimeter of diamonds 392 (MI) = 531.5 (MI)

531.5 (MI) = 29.53 (Synodic month) x 18



Thus, the line of eight cups, were used in conjunction with the main “swastika” design, brings together all the key values of the 18.6- year Moon cycle, 27.55 Anomalistic month days, and 29.53 Synodic month days.

Finally if all the key values on the Swastika Stone design are added together:

Linear Total	-	392 (MI)
Eight Cup Line	-	139.5 (MI)
Serpentine Motif	-	413.42 (MI)
Triangles Total	-	885.9 (MI)
Grand Total	**-**	**1830.8 (MI)**

1830.8 (MI)	=	29.53 (Synodic month days) x *62 (*62 x 3 = 186 moon cycle x 10)
1830.8 (MI)	=	29.53 (Synodic month days) x 27.55 (Anomalistic month days) x 2.25

It should also be noted that the width of the stone the Swastika Stone is carved on to measures 5.2 metres.
This equals 812.075 (Mi)
29.53 x 27.5 = 812.075 (Mi)

STONE 56

Stone 56, (map reference 0972 4652), numbered SM 25389, is on higher ground over-looking the Swastika Stone, and has six deep hollows on the vertical east face.

The perimeter measurement from centre to centre of the six hollows is 186.07 cms, 290.08 (mi).

A division of the synodic month by three yields a value of 9.83333 days, and if this is multiplied by 29.5, the number of days in the month, it equals the perimeter measurement.

From the three hollows two-four, three-four and three-five gives measurements of 27.755cm, 43.27(mi), 17.78cm, 27.72(mi) and 16.94cm, 26.41(mi). They give a total for the three values to be 62.48cm, 97.4(mi), which is equal to a division of the solar year by 3.75.

The design total for the perimeter and the three inner measurements is 248.54cm, 387.48(mi). A division of fifteen anomalistic months by sixty-four yields a value of 6.458 days and if multiplied by sixty equals the design measurement. In this design the two months synodical and anomalistic are represented, they are the months that influence the movement of water.

The six carved hollows on this stone are well defined and larger than the ones on the first stone, therefore their circumferences were considered to be part of the design. The following measurements were:

Ring one:	45.39cm	=	70.71(mi)
Ring two	47.88cm	=	74.64(mi)
Ring three	31.92cm	=	49.76(mi)
Ring four	31.92cm	=	49.76(mi)
Ring five	35.91cm	=	55.98(mi)
Ring six	27.04cm	=	42.16(mi)
Total	220.02cm	=	343.02(mi)

Total figure for all three quantities, 186.07cm, 62.48cm, and 220.02cm equal to 290.09(mi), 97.4(mi) and 343.02(mi) is 730.51(mi), the number of days in two solar years.

It is worth noting that the ring circumferences are very close to being multiples of the value of 7. (70, 49,49,56,42 and 74.6 (32/3 x 7).

The final grand total for all six rings totals 343mi = 7 x 7 x 7.

Both the Swastika Stone and Stone 56 use the value of 7 on many occasions alongside the astronomical values of 365.25 days (solar year), 27.55 days (Anomalistic month) and 29.53 days (Synodic month.)

The following equation may explain why this occurs to unify the lunar and solar values.

Seven years (365.25 x 7) = 2556 days

29.53 x 27.55 x pi (3.142) = 2556 days