Biggar Archaeology group

Bringing the past to the present

The Wildshaw Burn Stone Circle

by Tam Ward, 2012

www.biggararchaeology.org.uk

Introduction

The Wildshaw Burn Stone Circle was discovered by the Biggar Archaeology Group (BAG) on the last day of 1989 during their voluntary survey (Ward 1992) of the corridor of land which was to become the new M74 motorway between Happendon Lodge (J12) in the north to Beattock Summit in the south. The northern part of the new road was built over an alignment which traversed upland moorland and upon which no previous archaeological surveys had been done and no archaeological sites were known.

The circle, or more accurately an ellipse (Fig 1) was immediately surveyed and brought to the attention of the world through various media initiatives, the publicity led to more formal archaeological work to be done on the motorway route funded by Historic Scotland. Further voluntary survey work was done under the supervision of the writer and a series of excavations (but not on this site) were conducted by Glasgow University.

At the time of discovery the monument was suspected (by BAG) of having possible solar alignments connected with midsummer and midwinter solstices, however none were witnessed until five years later when the first of several was recorded, that was midwinter sunrise. Continuous monitoring of the site by BAG has now produced the data given in this report with a re-survey, but which still draws on the original report on the site (Ward 1992 ibid) while adding much new information.

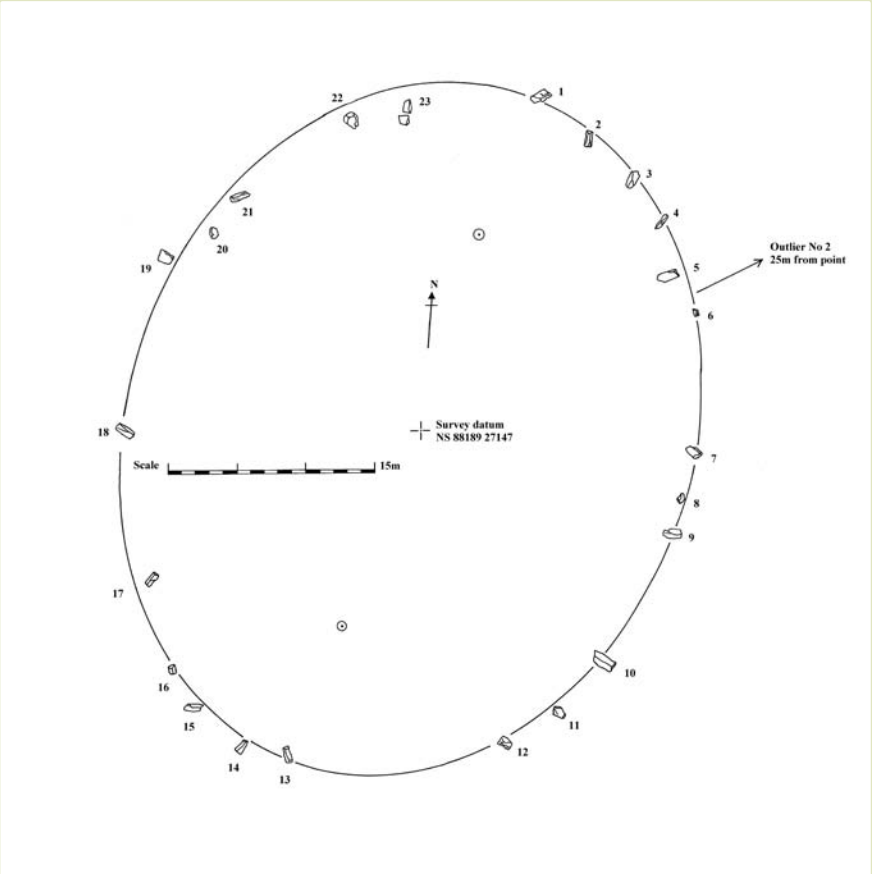


Fig.1

The monument

The circle was originally given as Site No 20 and is found on OS 1:10,000 map sheet NS 82 NE and on OS 1:50,000 Landranger; Upper Clyde Valley. Approximately in the centre of the circle a survey datum was established (Fig 1) and this point was fixed by GPS at NS 88189 27147. The site is located on fairly level ground on the east side of the Wildshaw Burn and lies between the 285m and 290m OD contours. The monument is located 700m west of the Red Moss Hotel and 500m north of the point where the burn flows under the former A74 (now the B7078) road at a layby. It now lies between the M74 motorway and the B7078 road (Pl 1).

The monument is almost a perfect ellipse (Fig 1) with its 52m long axis is aligned NNE/SSW; the short axis measures 42m across, these sizes are taken from the 'best fit' diagram. The internal area is approximately 1715 square metres. The total circumference of the superimposed ellipse is 145m and this gives an even spacing of 3.6m apart for forty two hypothetical positions Fig 2.

Thirteen stones were visible on the day of discovery and a further ten were located by probing the peat which covers the site to a depth of 0.3m to 0.5m. A maximum of 150mm of peat/turf was removed from the buried stones to reveal their full size only and now the entire twenty three are visible.

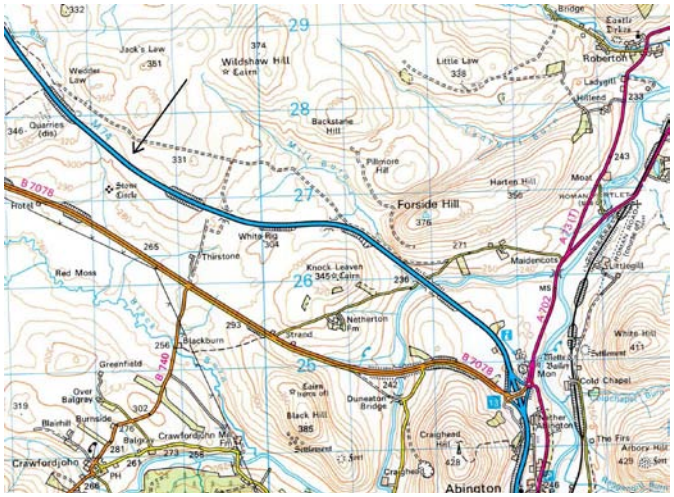


Plate 1:

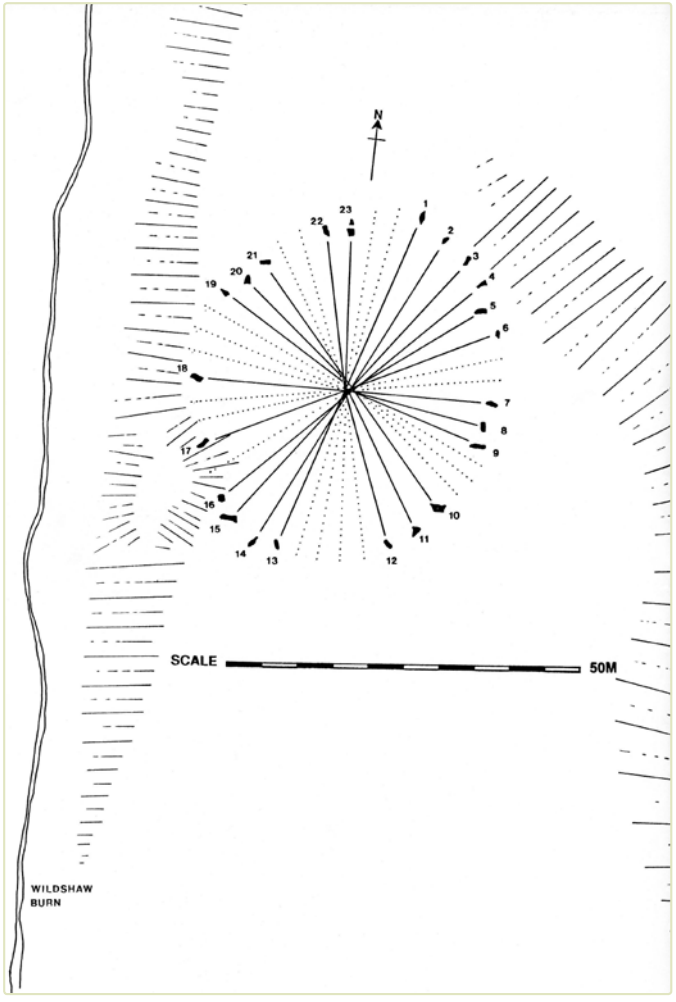


Fig 2:

Plate 2:

Plate 3:

Nearly all of the stones are prostrate, the largest is 1.75m long (see appendix I for full descriptions of stones). The existing groupings of stones are located with approximately 3.6m gaps between them. The areas between the stones may be subdivided into similar distances and if imaginary stones were allocated to these spaces, then a total of forty two stones would occupy the perimeter of the site.

The stones are all tertiary andesitic tholeiite and must have been gathered from an outcrop of an exposed igneous dyke some 200m to the NW (Pl's 2 & 3). This is one of a series of dykes emanating from the Island of Mull and is known as the 'Mull Swarm' Fig 3.

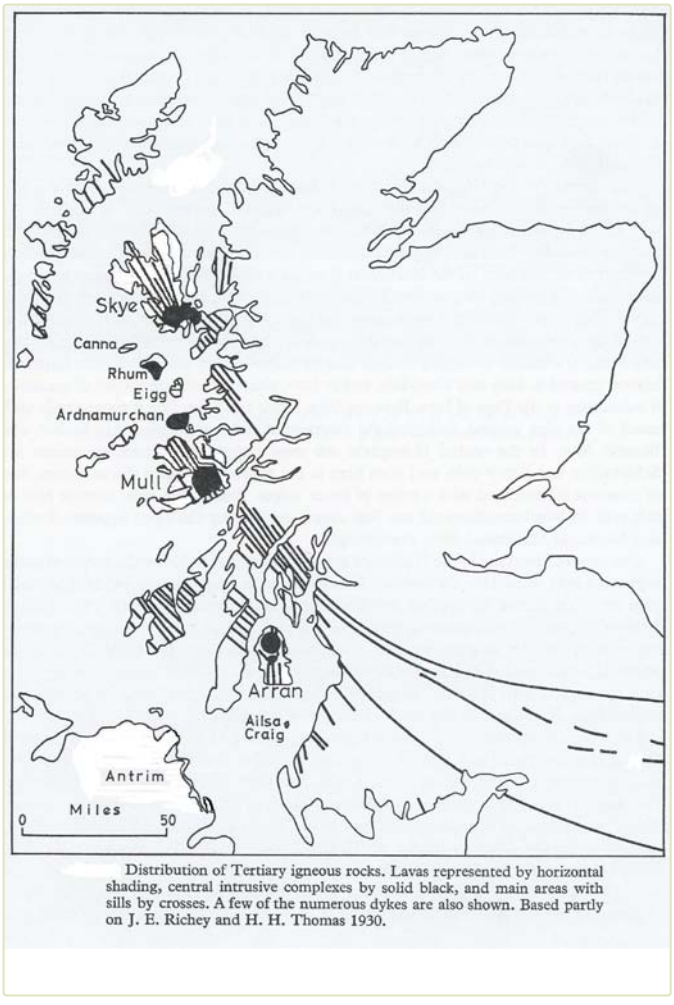
The site is on a gentle SW facing slope (Pl 1) and has good visibility in all directions to the distant horizon, except on the north east side where the ground rises away immediately from the monument. The surface of the ground within the circle slopes down to the south and west. From stone No 1 to stone No 13 there is a drop of 2.38m, and from stone No 18 to stone No 7 there is a drop of 1.41m. It is likely that this will reflect the original gradient of the ground when the monument was conceived. However, there is now a depth of up to 0.5m of peat and turf and the ground is boggy.

The ellipse

The method used to lay out the site need not have been complicated. If pegs were installed at A and B (Fig 4) and a loop of rope 82m long were placed over the pegs, the loop would reach point C. By pulling the slack of the loop tight and walking around the two pegs for one revolution, maintaining the tension of the rope loop, then a perfect ellipse would be achieved by marking the ground. The diagram shows four positions of the taught loop. No theoretical knowledge of mathematics or geometry is required. By varying the distance between the pegs and the length of the rope, different combinations of the shape and size of the ellipse can easily be achieved. Thus, given the length of rope and some temporary marking sticks, the Wildshaw Burn Stone Circle could have been laid out within an hour.

The position of the complete ellipse superimposed on the actual plan of stones is given as a 'best fit'. Only excavation could reveal if the stones were erected in socket holes and whether the gaps ever had stones or were prepared for them. The position of the pegs is of course hypothetical, but the 31m distance between them would be the correct distance if the loop method was used to lay out this monument.

While the practicality of construction of the this monument is not complicated nor exceedingly difficult given enough muscle power, and need not have been for the builders, the exact selection of the site location, the orientation of the ellipse and the placing of individual stones to achieve the symmetry and sight lines of the monument is altogether another matter, and this leads directly to the question of function.



Distribution of Tertiary igneous rocks. Lavas represented by horizontal shading, central intrusive complexes by solid black, and main areas with sills by crosses. A few of the numerous dykes are also shown. Based partly on J. E. Richey and H. H. Thomas 1930.

Fig 3

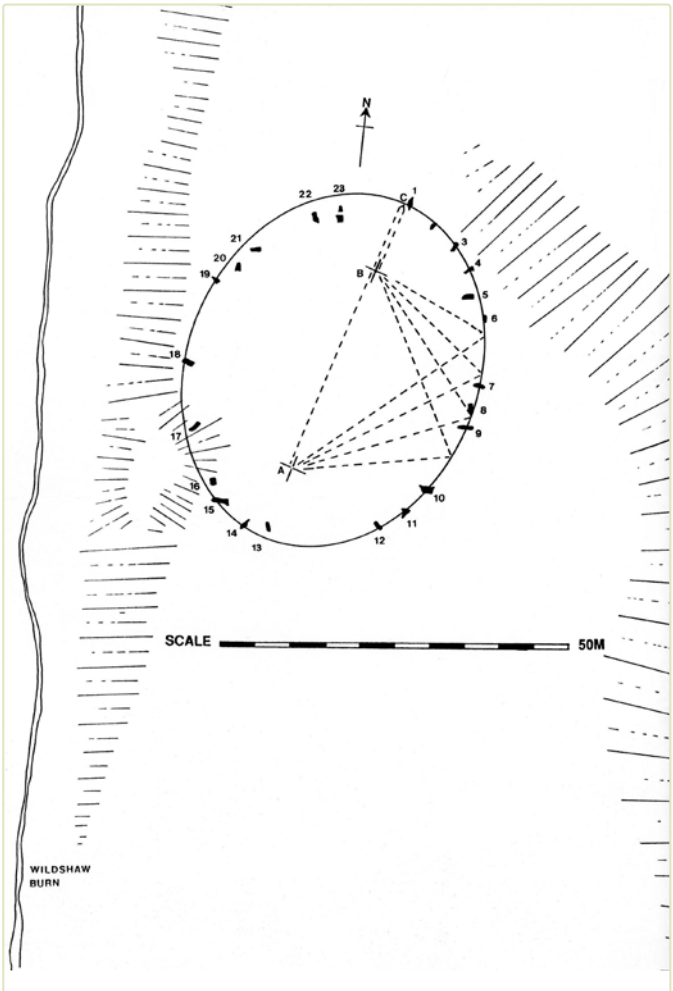


Fig 4

Geology and building the monument

(British Geological Survey, 1985)

The underlying solid geology of the landscape within which the monument sits is the southern boundary of the Midland Valley, and consists of both volcanic and sedimentary rocks. However, running through the SW of Scotland are a series of Tertiary igneous intrusions, known as dykes. The dykes emanate from the island of Mull and traverse the whole of SW Scotland Fig 3. One such dyke (Pl's 2 & 3) can be traced on the surface of the ground 200m uphill and to the NW of the monument, and it is evident that all the stones used for the circle have been derived from that source. The stone is an andesitic tholeiite and forms as columnar jointing and is hard and fresh.

The stones would simply have been gathered from the nearby source and, assuming they are all the original size, that is to say of modest size apart from the largest example; stone No 10, then no great difficulty would have been encountered in transporting them the short distance down hill to the site, perhaps requiring less than ten men pulling on sledges.

From what may be seen, none of the stones have been shaped or worked and there is no rock art visible on any of the exposed surfaces (see appendix I for stone details). Two stones however have subsequently been fractured by weathering (No's 22 & 23).

It is abundantly clear that at least nineteen of the twenty three stones are lying prostrate on the ground, including the large No 10. Four other stones (No's 6, 8, 16 & 20)) appear to be set into the ground and as such their full size cannot be determined, however it is clear that they range in size considerably and their shapes and sizes do not seem to form a pattern of use, apart from marking out the ellipse, and apart from No10 which does form alignments (below).

It is perhaps the symmetry of the site which is so striking despite the fact that many stones appear to be lying on the ground. It is nevertheless abundantly clear that even if the recumbent stones were never set up, they were certainly laid down in accurate positions which can still be seen. The fact that some stones are lying on the ground means that their exact intended positions cannot be ascertained, leaving a degree of uncertainty and lack of confidence in analyses. We may assume the broad ends were going to be or were imbedded. None of the stones show any indication that they have been altered or broken in recent times and because of the symmetry they make on the monument, it seems unlikely they have moved by natural or human agency since the formation of the peat which now surrounds them.

Stones No's 13 – 21 on the west side are lying slightly off the terrace and on the slope down to the burn; again, because of the symmetry they make at present, it seems that they must always have been there. The fact that these stones are almost lying in the gully suggests that the position of the site, and these stones, had been determined even though they were going to be on the gully slope. Erosion of the slope is considered not to have taken place.

Outlying stones Fig 5 Plates 4 & 5

Two outlying stones have also been found;

A large stone (Outlier No 1) of similar dimension to No 10 in the circle and similar in appearance, being pointed at one end and broad at the other and being recumbent, is located 260m to the WNW (NS 87947 27238) (Pl 4) and aligns with Stones No's 7 and 19 in the circle. Like the stones in the monument this one has been transported from the igneous dyke to the north and which traverses the land in a W/E line. The stone is seen in total isolation in an otherwise stone free landscape and it seems unlikely that it has been transported geological from the dyke to its present position. It is therefore considered to have been dragged to the spot and probably erected as a standing stone to mark some as yet indeterminate purpose. The horizon on the alignment from the circle is currently obscured by a plantation, but the crossover between Mid Rig and Wildshaw hill must lie within a degree or two of the alignment. For location purposes this stone lies to the south of a ruinous drystane sheep stell.

Plate 4

Plate 5

The second outlier (No 2) (Pl 5) is only 30m from the circle, to the EEN and is more difficult to interpret because of its size and position, being small and close to the site. It may have no relevance; however, it does align with stones No's 20 and 3.

Purpose of the monument

The great debate regarding possible astronomical alignments for such sites is often difficult to resolve. However, at Wildshaw there is obvious evidence that a symmetrical feature was conceived, if not actually built, and the regularity of the overall shape and the spacing between stones and further sub division of spaces between them is quite striking.

The observation of the rising and setting sun from the site over the past twenty two years has now shown that at least one function of the site was for witnessing such events (Fig 5). Out of the four solstice alignments, only mid summer sunrise does not align with a pair/s of stones over the monument. Since this observation evidence is repeatable, given the right weather conditions, and is therefore demonstrable, it must be convincing that a major reason for the circle was calendrical prediction. The longest and shortest days of the year are therefore predictable from this site given favourable weather conditions.

Furthermore, equinox sunrise and sunset have now also been observed and these alignments are seen over pairs of stones. Therefore the year can be subdivided by quarters at Wildshaw.

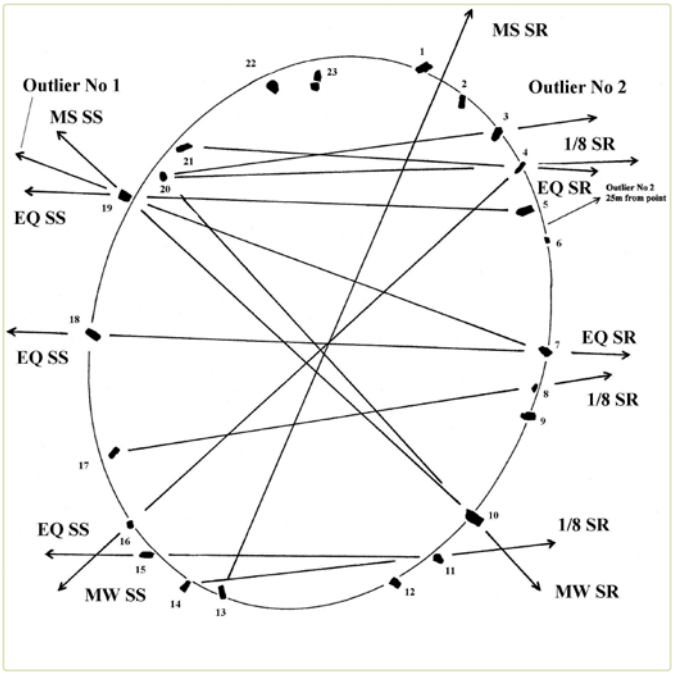


Fig 5

Incredibly, this phenomenon can be used to subdivide the year into eighth parts and this has finally been witnessed in 2012.

No doubt the place functioned for other ceremonial or ritual purposes and possibly for trading or meeting for a variety of reasons, however, none of that may be ascertained by viewing what survives on the surface of the ground.

Midwinter solstice

The first alignment event to be witnessed was mid winter sunrise over stones No's 20 to 10, this was some 5 years after the site was discovered. The alignment is to the cross over between Blackhill and Craighead Hill to the south east. The angle over the stones was 140º magnetic.

Mid winter sunset was eventually observed over stones No's 4 and 16 and to the summit of Braid Knowe in the southwest and at an angle of 232º.

Midsummer solstice

Mid summer sunrise is the only observed alignment which does not align with two stones, it is seen on the featureless horizon of the eastern flank of WedderLaw/ Jack's Law from Stone No 13 looking between stones No's 1 and 2 and at an angle of 25º.

Mid summer sunset is also on a featureless horizon on the southern flank of Wedder Law, but here it sets in alignment with stones No's 10 and 19 and at an angle of 313º.

Equinox

The vernal equinox was observed for both sunrise and sunset on the following occasions;

March 22nd 2003, sunset over stones 5 and 19 to the summit of Auchensauch Hill (Pl's 2 & 6).

March 24th 2003, sunrise over stones 21 and 4 to the featureless horizon of White Rig.

March 22nd 2012, sunrise over stones 18 to 7 to the featureless horizon of White Rig.

March 23rd 2012, both sunrise and sunset were seen;

The setting sun appeared to be aligned with stones No 7 and No 18 looking to the west and slightly to the right (or east) of the summit of Auchensauch Hill which has a prominent low point between the actual summit and a sub summit to the north. The magnetic bearing was 272º. See the sketch (Pl 6, with power cables removed from the image) of the event where the sun slid down the flank of the higher summit, dip into the low point and continued to drop until out of sight along the lower summit flank. However, perfect alignments over stones 5 and 19 and also 11 and 15 were also seen to align with the setting sun.

Plate 6

Therefore for observing sunrise there are two sets of alignments and for observing sunset there are also two excellent alignments and a possible third.

On the 5th August 2012 the sunrise was observed to take place in a perfect alignment across stones No's 17 and 8 and good alignments were also observed across pairs if stones 20 and 4 and also 14 and 11. The sunrise was seen at 6.50am and the magnetic bearing was 55º over stones 18 and 7.

Observation now shows that it would be possible from Wildshaw to divide the year by eighth parts and it may be possible to continue with this process in due course.

Although some of the dates of observation are a day or two out from the actual calendar dates it is considered here that such disparity will make little difference to the actual events. The suns disc also appears slightly off alignment compared to c4000 years ago, but this difference makes little general impression on what may be witnessed currently.

Calendar dates for main observation events

January		
February	5	sub dividing the year by eight
March	21	Equinox subdividing the year by quarter
April		
May	5	sub dividing the year by eight
June	21	Midsummer subdividing the year by half
July		
August	5	sub dividing the year by eight
September	21	Equinox subdividing the year by quarter
October		
November	5	sub dividing the year by eight
December	21	Midwinter subdividing the year by half

Other possible alignments

While solstice, equinox and eighth part events have now been witnessed, further sub divisions in calendrical time may also be marked by alignments. One possibility is by three apparent parallel alignments, at 260º and all pointing to the summit of Cairn Table (hill) (NS 725 243) and 16km towards the west (Pl 2). The sets of stones are; 3 to 19, 6 to 18 and 7 to 17, each making near perfect alignments to the hill top where two probable early Bronze Age cairns exists. However, this alignment does not appear to be the mid way point between the mid winter and equinox sunsets and is therefore unlikely to be the equal sub division one would expect between these two events.

The large outlying stone to the west (No 1) (Pl 4) makes an alignment with stones 7 to 19 at 290º and to a relatively featureless horizon on the south flank of Wedder Law. It seems probable that this alignment will have some significance assuming the outlier is positioned where originally intended.

The small outlier (No 2) (Pl 5) lying some 30m from stone No 6 and to the NE also makes an alignment with two stones; these being No's 20 and 3

It was thought that the two outliers may have indicated the eighth part positions but that is now shown not to be the case. Attempts to witness the rising and setting motions of the sun will continue over these and other alignments to establish if they are truly significant.

Site context

The site is located beside the small burn on its western side and from which it has been named, and this may have some significance, however the orientation of the ellipse and the fact that it is not on completely level ground seem to indicate that the location is not the result of chance, but has been deliberately selected. For example why transport the stones from the outcrop when there is similar ground in that vicinity? If only a meeting place of some sort was required.

The immediate surrounding landscape is devoid of further known archaeological sites apart from two further up hill from the monument and which were suspected as being an enclosed cremation cemetery and a possible 'hut'; however, the putative cemetery was excavated by Glasgow University with inconclusive results (Leslie 1991).

It is possible, indeed probably that other sites do exist in the locality but lie below the peat which generally covers the whole area. The Red Moss (Pl 1) which covers a large tract of ground on the west side of the B7078 and forms a broad shallow valley floor, has peat which reaches depths up to 2m.

Nevertheless, the entire upper reaches of the River Clyde valley just a short distance to the east abounds in pre historic sites, most especially for the Bronze Age but with a few locations producing Early and Late Neolithic evidence, this is also true for the Crawfordjohn area a few kilometres to the south.

The entire region has been subject to intense archaeological survey and excavation fieldwork carried out by BAG over the last twenty years or so, and the area is known intimately by them, having recorded the majority of sites there for the first time. Other archaeological excavations have been done through developer funded work and much evidence of pre history including the Late Neolithic and the Bronze Ages have been achieved, all of which have enhanced the data base of sites of possible relevance to Wildshaw.

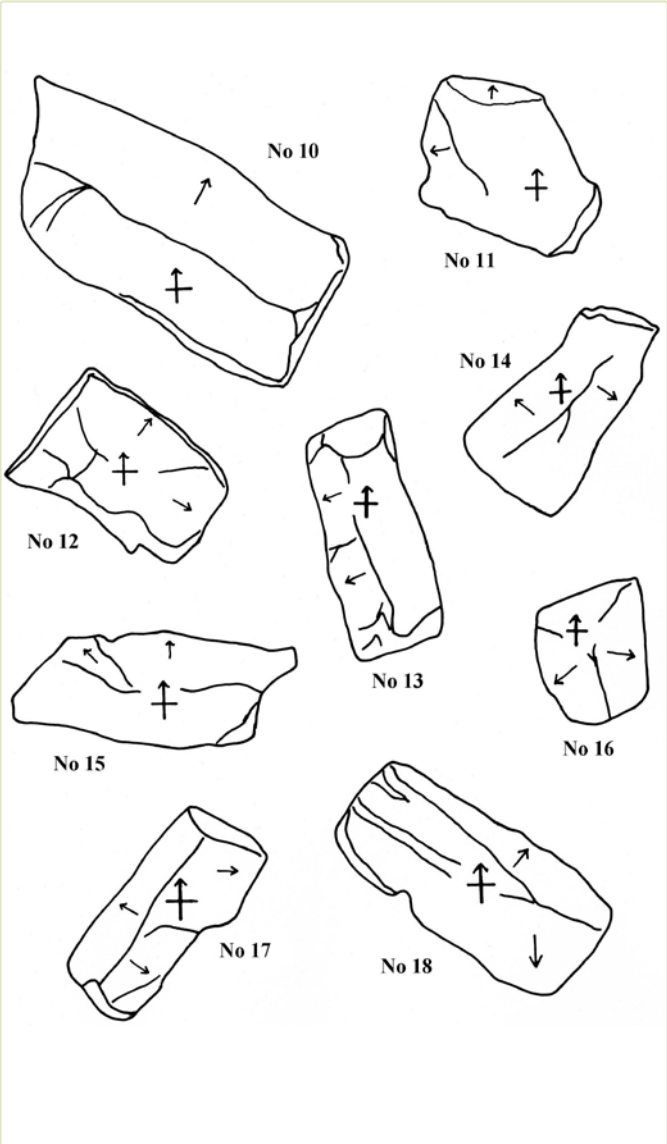


Fig 7

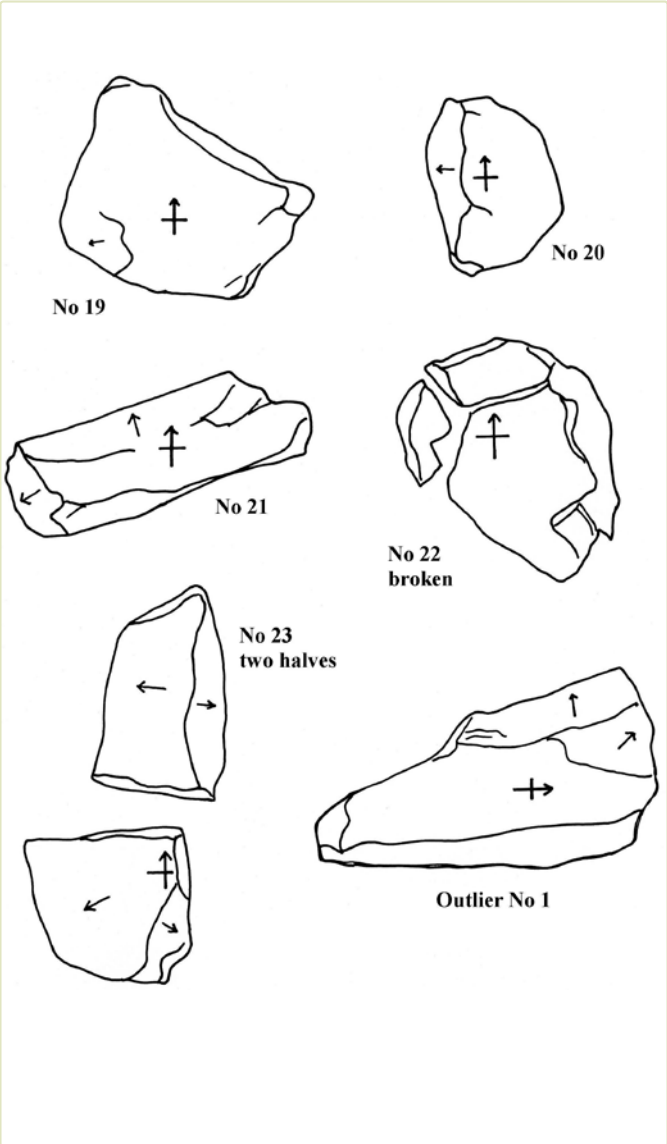


Fig 8

Plate 7

Plate 8

Plate 9

Plate 10

Plate 11

Plate 12

Plate 13

Plate 14

Plate 15

Plate 16

Plate 17

Plate 18

Plate 19

Plate 20

Plate 21

Plate 22

Plate 23

Plate 24

Plate 25

Plate 26

Plate 27

Plate 28

Plate 29

Plate 30

Discussion conclusion

Wildshaw Burn is the only known stone circle in Lanarkshire despite the plethora of pre historic remains of all periods in that area. Numerous examples of circles (Burl 1995) may be seen scattered across Dumfries and Galloway to the south and stretching from the Irish to the North Seas, but otherwise such monuments are rare in southern Scotland. Wildshaw fills a huge void in the map of such sites in south central and western Scotland.

Further east in Berwickshire a monument, also elliptical in shape may be seen near Lauder; Borrowston Rigg (RCAHMS 1915), and closer in Peeblesshire there is a small peculiar monument at Kirkurd; however Harestanes (RCAHMS 1967) as it is known, stands in a front garden and is only about 3m in diameter and as such can hardly be considered to be comparable to Wildshaw.

It has not been established whether the Wildshaw monument was completed or even if it was actually built, but the available visible evidence of the stones in their present configuration and taken with the observations which have been made since its discovery, clearly shows intent to use the place as a solar observatory.

As stated above, its layout and construction on the ground would not have presented any great difficulty, however its exact position, orientation and size of the monument on the ground must have been the result of an extended period of research by the builders, no doubt involving years of trial and error. To have succeeded in achieving the established solar alignments using pairs of stones as fore and back sites is an amazing feat, and other alignments may yet be witnessed. The midwinter sunrise and equinox sunset positions on the horizons also take place on prominent locations and it appears that this may also have been planned rather than be simply co incidental. The two outlier stones also may indicate the positions of further sub division of the year, although this has not yet been observed.

Although this has not been attempted by the writer one wonders if site lines were established for events and then these may have been gradually drawn in to a single location and shape, in this case because so many alignments have been established, an ellipse was necessary. If the theory can be done it may be that an ellipse has more possibilities than a true circle for alignments.

If the proposed solar alignments can be accepted then it follows that clear lines of sight to horizons must have been available from the monument, thus any tree cover would have to be removed to allow this. Although it may have been that deforestation of the landscape was advanced and would therefore counteract that perceived problem.

There are reckoned to be around a thousand stone circles in Britain and Ireland and in his book Aubrey Burl (Burl 1995 ibid) lists seventy eight examples which form elliptical shapes. However it appears that few, if any can match Wildshaw for such uniformity of shape, being practically a true ellipse, symmetry in location and spacing of the stones and the distances of absent stones being equally sub dividable, and most of all for the events which have now been witnessed from the site.

The purpose of any stone circle remains debateable, however, the inescapable fact that so many solar events may still be witnessed here at cardinal points of the year strongly suggests that observation of the sun and calculating the seasons was a primary purpose at Wildshaw, whatever other events or activities may have taken place.

Despite intensive search, the monument appears relatively isolated in its location; although this has to be qualified by the fact that peat lies all around and for distances of up to a mile away. Recent work in the Daer Valley to the south (Ward 2012) shows that only a 0.5m depth of peat can cover a myriad of sites , including monuments built with stone. It may be that a similar situation exists in the Red Moss area.

References

Even allowing for other (at present unknown) local sites, perhaps settlement areas, it seems plausible to suggest that Wildshaw may have been a regional centre which serviced a wider community, perhaps having a radius of up to 15 to 20 miles, where at least in Upper Clyde valley from Carnwath to Crawford there are arguably the largest numerical concentration of Neolithic and Bronze Age sites in Scotland. Perusal of the Sites and Monuments Records of Scotland will testify to that.

One thing is certain; if this monument were subject to more accurate and expert analyses than the BAG are able to do, a considerable more information would be forthcoming, making Wildshaw Burn Stone Circle an even more remarkable monument on the South Lanarkshire and Scottish landscape.

This monument is therefore commended to others as a research project on Astro-archaeology and one which would surely amply reward further enquiry.

The Wildshaw Burn Stone Circle was created a Scheduled Ancient Monument soon after its discovery.

Since the discovery of Wildshaw Burn Stone Circle in 1990, electric cables from pylons and local power networks have been installed and are seen on various horizons from the site, these certainly now detract from the former visual seclusion and atmosphere of the monument within its environs.

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Appendix I

The survey method was to use a dumpy level from the datum, zeroed to 0 magnetic and then used to measure the angles to each stone, which were marked with a cross (in chalk), the cross centre was approximately centrally placed on each stone and was used to draw the stone at 1:10 scale and also zeroed to 0 magnetic (Figs 5, 6 & 7). The distance and angle to the nearest degree from the datum to the centre of the chalk mark was then measured. The centre spot for each cross was recorded by GPS.

Details of stones

Figs 6 – 8 & Plates 7 - 30

Notes:

The stones are arbitrarily numbered.

Measurements are to the nearest 0.1m and depths are given on the assumption that the stones lie flat at the base of the peat, excepting for No's 6, 8 & 16 which appear to be set into the ground, their depths are therefore unknown. For irregular shaped stones the breadth given is the maximum size.

Stone No.	Length/ Breadth/ Depth (on ground)			GPS (all NS)	Distance & angle from Datum	
No 1	1.82m	1.75m	0.5m	88199 27171	25.7m	200
No 2	1.2m	0.5m	0.5m	88203 27169	24.5m	300
No 3	1.5m	0.7m	0.5m	88207 27167	24m	400
No 4	1.4m	0.5m	0.3m	88208 27163	23.5m	490
No 5	1.7m	0.65m	0.3m	88209 27159	21.5m	580
No 6	0.5m	0.3m	unknown	88211 27156	21.9m	670
No 6 appears to be set into the ground although now leaning.						
No 7	1.4m	0.65m	0.35m	88211 27146	20m	940
No 8	0.8m	0.5m	unknown	88211 27141	19.7m	1040
No 9	1.4m	0.65m	0.3m	88210 27138	20m	1120
No 10	1.7m	0.9m	0.5m	88202 27126	21.5m	1420
No 11	1.2m	0.8m	0.3m	88200 27123	23m	1530
No 12	0.95m	0.7m	0.5m	88197 27124	23.4m	1640
No 13	1.2m	0.45m	0.4m	88182 27123	25m	2020
No 14	1.1m	0.55m	0.3m	88179 27124	26m	2090
No 15	1.5m	0.7m	0.4m	88175 27124	25.7m	2190
No 16	0.85m	0.45m	0.55m	88173 27128	24.8m	2260
No 17	1.11m	0.56m	0.5m	88171 27136	24.8m	2410
No 18	1.42m	0.7m	0.5m	88170 27143	21.4m	2700
No 19	1.2m	0.94m	0.5m	88172 27157	22.3m	3040
No 20	0.87m	0.7m	0.5m	88176 27158	20.6m	3140
No 21	1.44	0.5m	0.5m	88177 27163	21.3m	3230
No 22	1.3m	0.86m	0.5m	88186 27167	23m	3480
No 22 is broken						
No 23	0.75m	0.8m	0.5m	88190 27168	22.5m	3580
No 23 is broken Broadest 'lower' half (No 23)						
	0.98m	0.65m	0.5m			
Pointed 'upper' half (No 23)						
Outlier No 1	1.5m	1.0m	0.45m			
Outlier No 2	0.3m diameter, stone appears to be set into ground therefore the depth is unknown.			88237 27172		