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SOME MEGALITHIC SITES IN SHETLAND

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In 1976 we made a short visit to Shetland and surveyed a number of the Megalithic sites there. The islands are about 70 miles long and stretch from latitude 59°51′ to latitude 60°51′.

Assisted by the one-inch O.S. maps we found a number of standing stones, but in many cases we experienced a sense of frustration because we felt that we were looking at only the remains of what had been there. This feeling was engendered in places by seeing fallen stones and heaps of stones lying nearby. We crossed from the Mainland first to Yell and then to Unst where, at Lund, we found probably the tallest stone in the islands.

Lund on Unst (578 034)

The menhir here is about 13ft high with at least one other stone beside it. Unfortunately, the Sun did not appear during our brief visit and so we had to depend on our prismatic compass for azimuths. We applied the magnetic variation taken as 9°·5W and the approximately known compass error and then from three measurements in various directions found the azimuth of the plate zero of the theodolite. While these measurements were consistent to $\pm 0°{\cdot}1$, this method is not reliable and the site ought to be surveyed properly. It is to be noted, however, that a 1° error in azimuth produces in this latitude a declination error of only about 0°·3. We give the results as we found them.

To the northwest there is a prominent lump on the horizon. The azimuth of the deep dip to the right of the lump is 324°·0 and the altitude 47′. These observations yield a declination of 24°·1 and so this showed the upper limb of the midsummer setting Sun. There is a menhir to the southwest on a hilltop, about $\frac{1}{4}$ mile distant, azimuth 218°·6 and altitude 3°43′. These angles yield a declination (with lunar parallax) of $-18°17'$ which is near $-(\epsilon - i - s + \Delta)$, and so this menhir is perhaps a foresight for the Moon setting at the minor standstill. There is a fallen stone at a lower level than the main stone at an azimuth of about 44°, and so the three stones are nearly in line.

The flat face of the main menhir is orientated on a low lump on the horizon to the southeast. Unfortunately we did not have time to visit this, but the particulars are: azimuth 154°·2, altitude 2°18′, declination $-24°{\cdot}2$, and this is so close to the lower limb of the solstitial Sun that we may assume it to be intentional. We see that the Lund site gives two solar lines and one lunar, and it is important in that it lies at latitude 60°42′ in the most northerly of the Shetland islands and so it is on the farthest north island in the British archipelago. Near it there is a very large ring of scattered stones which may be a field boundary but, in view of what we found at the other end of Shetland on East Burra, it ought to be surveyed to determine whether it is Megalithic.

The Giants' Stones (*Mainland*) (243 805)

When we plotted our survey of these stones and the smaller stones nearby,

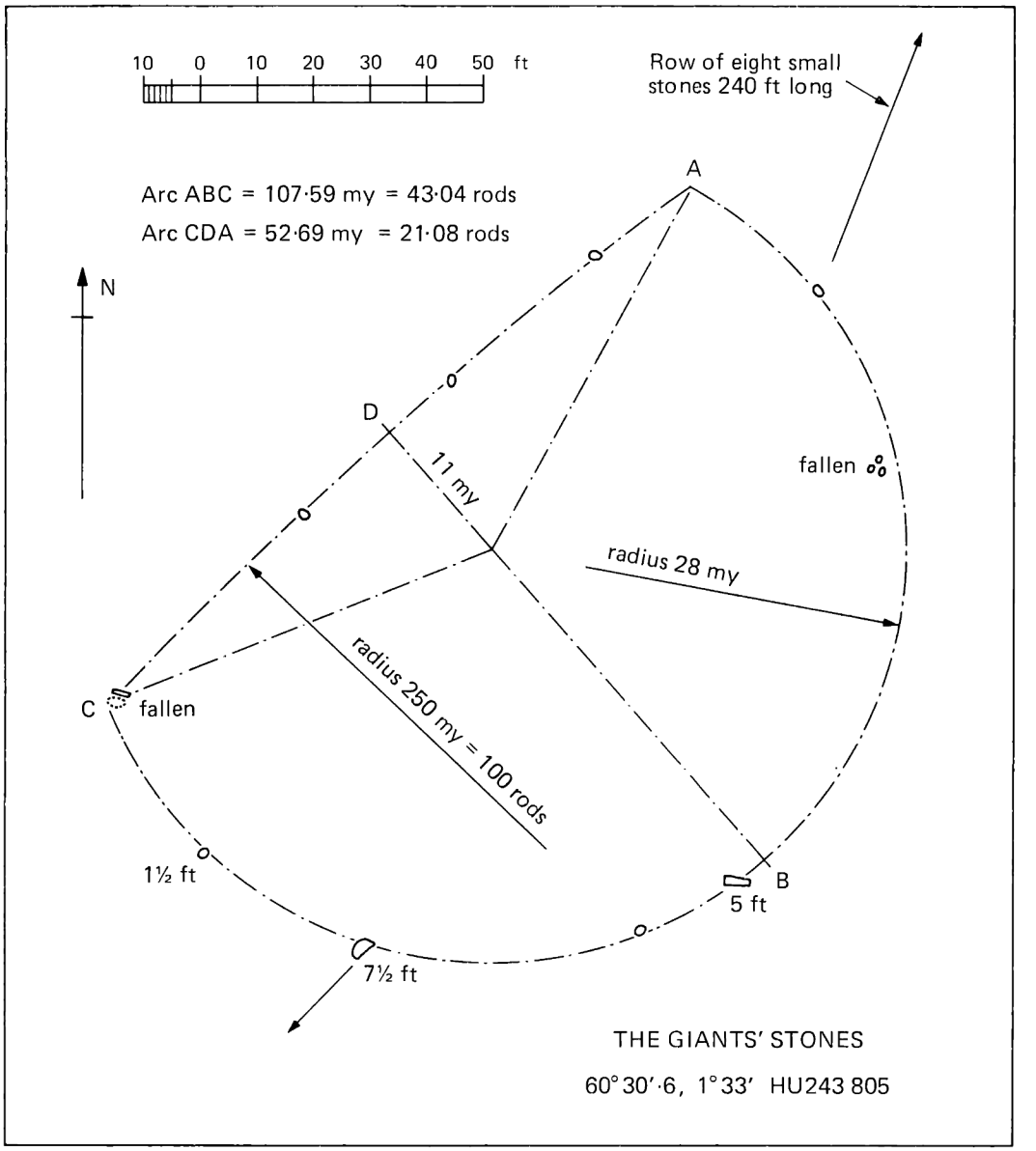

FIG. 1. The Giants' Stones.

this proved to be a most interesting site and we were sorry that we had not measured all the surrounding hill altitudes.

The two main stones which give the site its name are 7½ft and 5ft high, but of the other stones the highest is 1½ft and we had doubts about the desirability of surveying them. However, it proved well worth the hour spent. We have superimposed on the survey (Figure 1) two circular arcs, one with a radius of 28 Megalithic yards (my) and one with a radius of 250 my, *i.e.* 100 Megalithic rods. It will be seen that these pick up every stone which is still in place. Using the fact that the flat arc passes exactly 11my from the centre of the long arc, we calculated carefully the lengths of the two arcs. These were 107·59my and

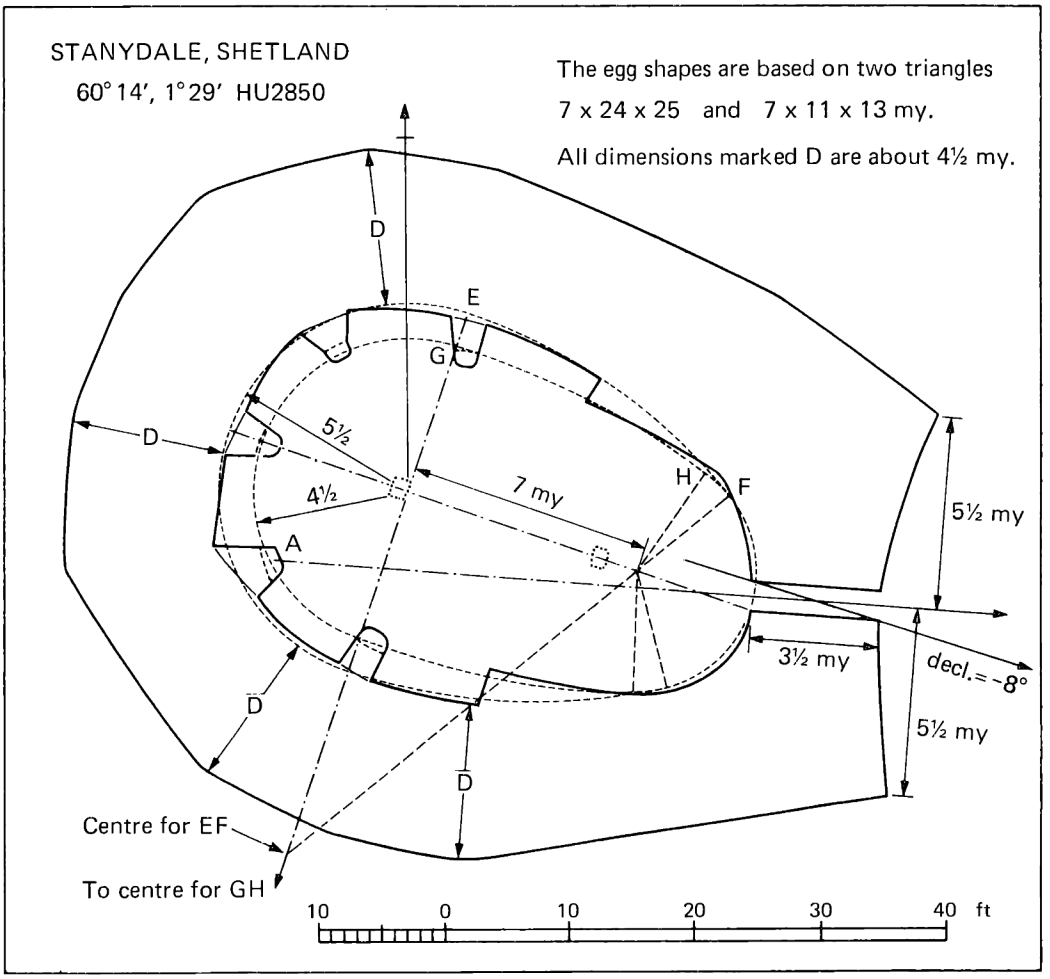

FIG. 2. Stanydale.

52·69my. Note how close these lie to 107·5my (43 rods) and 52·5my (21 rods). It is shown in *Megalithic sites in Britain*[1] that an attempt was always made to get the perimeter of a ring integral in rods and here we see that the rule was extended to the individual arcs. It is interesting to find a ring with corners. In fact, we know of only one other, namely the huge ring at Avebury, and there again all the arcs are integral in rods.

There is a row of small stones running for 240ft from the ring at an azimuth of 20°·5. We do not know the horizon altitude on this bearing but if it is about 1° then this gives a lunar line of declination $(\epsilon+i)$.

We did note the particulars of a cliff on the horizon at 217°12′, altitude −5′. These values (with refraction 35′ and latitude 60°30′) give a declination of −23°43′ or close to the upper limb of the Sun at the winter solstice. The cliff seems however to be relatively near and so erosion would have a large effect.

It is not clear why the large stones in the ring are placed at the peculiar angles shown but further work might give the reason. For example, the flat face of the 7½ft stone perhaps gives the setting Moon at the minor standstill.

Stanydale (285 504)

We were so impressed by this site that although it was late we decided to make a survey immediately. The result is shown in Figure 2 which we believe is correct to a few inches. The site is described by C. S. T. Calder.[2]

He gives a good small-scale survey with, naturally, more detail than now appears above the ground. We do not know if the fact that the outside of the wall seems to consist of a series of chords is an original feature or the result of the partial reconstruction which took place. This wall is now about 5ft high but the five upright stones which stand inside are only a few feet high.

We have superimposed carefully the two egg shapes to which the inside conforms. The small end of each of these is $3\frac{1}{2}$my radius while the radii of the large ends are $4\frac{1}{2}$ and $5\frac{1}{2}$my. The distance between the centres is 7my in both eggs.

These are the basic dimensions and if we assume Type I eggs,[3] the other radii follow from calculation and so we find the dimensions given below:

	a	b	c	$\sqrt{(b^2+c^2)}$	Perimeter
Inner egg	25	24	7	25	39·32 for 40
Outer egg	$13\frac{1}{4}$	$11\frac{1}{4}$	7	$13\frac{1}{4}$	43·02 for $42\frac{1}{2}$
or	13	11	7	13·04	43·01 for $42\frac{1}{2}$

It will be seen that the first triangle is perfect in integers and the second in quarters but we suggest that the triangle which the erectors had discovered was 7, 11, 13 and not 7, $11\frac{1}{4}$, $13\frac{1}{4}$. Note that 7^2+11^2 is 170 and 13^2 is 169. The actual error in the hypotenuse is only 0·038my or 0·10ft.

The perimeters are a little below the usual standard but it should be borne in mind that here are two eggs with common centres. We do not know why the passage is slewed away from the main axis but we draw attention to the fact that a man standing at Stone *A* would see the full orb of the Sun above the horizon on the axis of the passage two days before the true vernal equinox, that is, about three days before Megalithic Man's equinox.

When the sunrise lies to the right of the axis the Sun cannot shine into the building. The first day in spring when a ray can get through the passage is when the declination is $-8°{\cdot}3$ and this is the declination exactly one Megalithic month (23 days) before the equinox.[4] The last day in the autumn when the Sun shone into the building was one Megalithic month after the autumnal equinox (22 days).

We have often pointed out that the best time of year to fix the calendar was at or near the equinox when the Sun's daily movement along the horizon was at its greatest. To the Shetlanders the movements of the Sun have always been of the greatest importance and it is possible that Stanydale was a solar temple. There does not seem to be a radiocarbon date for this structure but it is probably Megalithic. It is consequently interesting to see that Calder states that the wooden posts that were in the two postholes were of spruce. These were presumably imported from Scandinavia because spruce was not introduced into Scotland until A.D. 1548, in which case their presence shows that there was free communication with Shetland in reasonably large boats. However, according to A. S. Henshall,[5] a more likely source of the spruce is American driftwood.

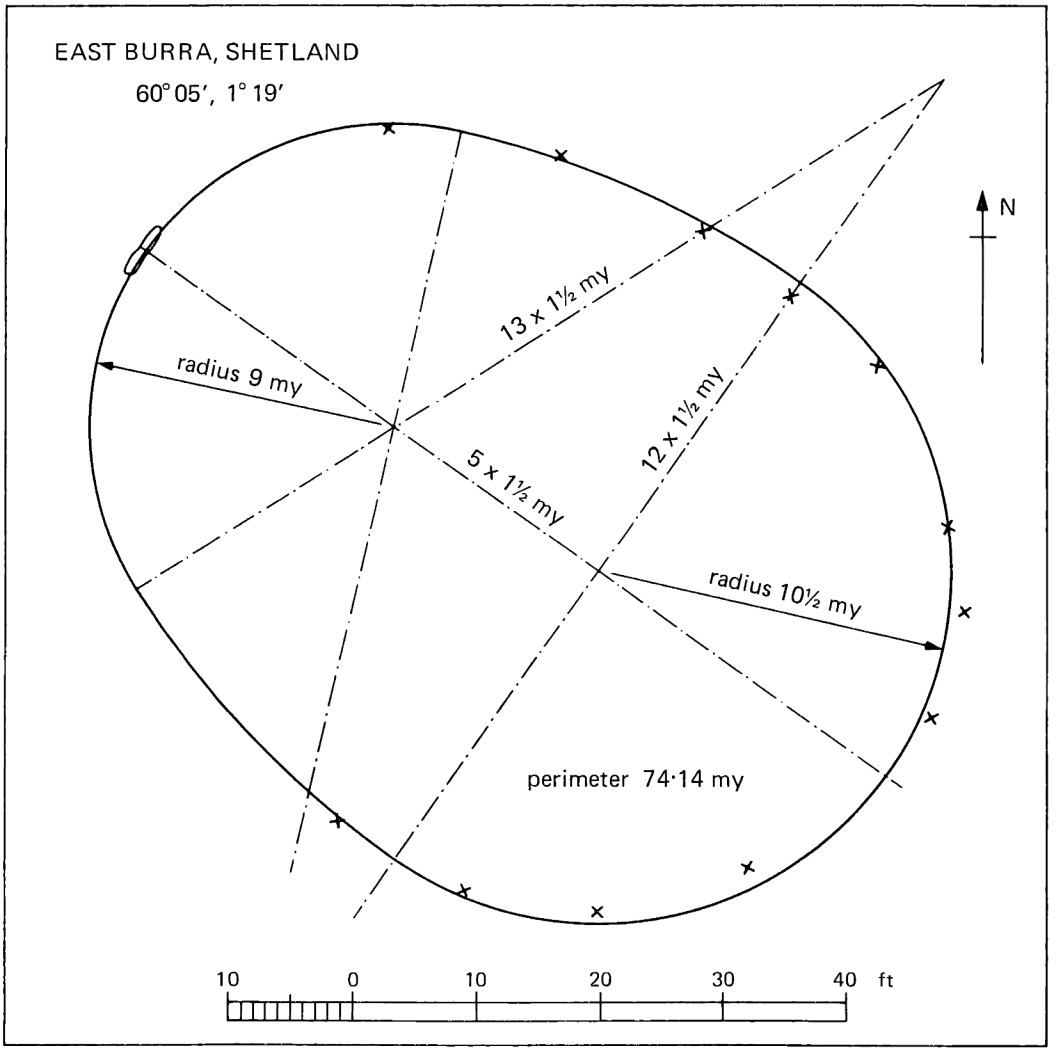

FIG. 3. East Burra.

Wormadale Hill (405 465)

We found a stone here that gives a lunar declination. The megalith was on more or less level ground on top of Wormadale Hill. From here the high cliff at Fitful Head (nearly 20 miles distant) is seen to fall steeply but the bottom is cut off by near ground. The well defined corner so produced has an azimuth of 192°01′ and an altitude of −21′·7. Applying refraction 38′ and parallax 57′ we obtain a declination of −29°07′·4. Taking this to be $-(\epsilon+i+s+\Delta)$ yields a value of ϵ within 1 arc minute of the mean value found at Brogar in Orkney. It seems unlikely that the inevitable erosion of the cliff 20 miles away can have affected the declination materially.

The Island of East Burra

On this island there is a stone (*A*) of height 6ft from which a stone (*B*) of

height 2ft is visible on the horizon about one-third of a mile distant. The azimuth is 61°·5 and the altitude is 2°·9. These give a declination of 16°·2 which is close to that of the Mayday/Lammas Sun. There are other stones near *B* but not visible from the main stone *A*.

Near *A* there is a scatter of loose stones lying in a ring. Some of these are upright and earthfast. We made a rough survey of the site putting in the earthfast stones, and in the remainder of the ring we took the mid-points of its width. When we plotted the points (Figure 3) we were rather surprised that they lay on a Megalithic egg based on a 5, 12, 13 triangle and having a perimeter of 74·14my (for 75). Obviously this site is worthy of much greater attention than we gave it.

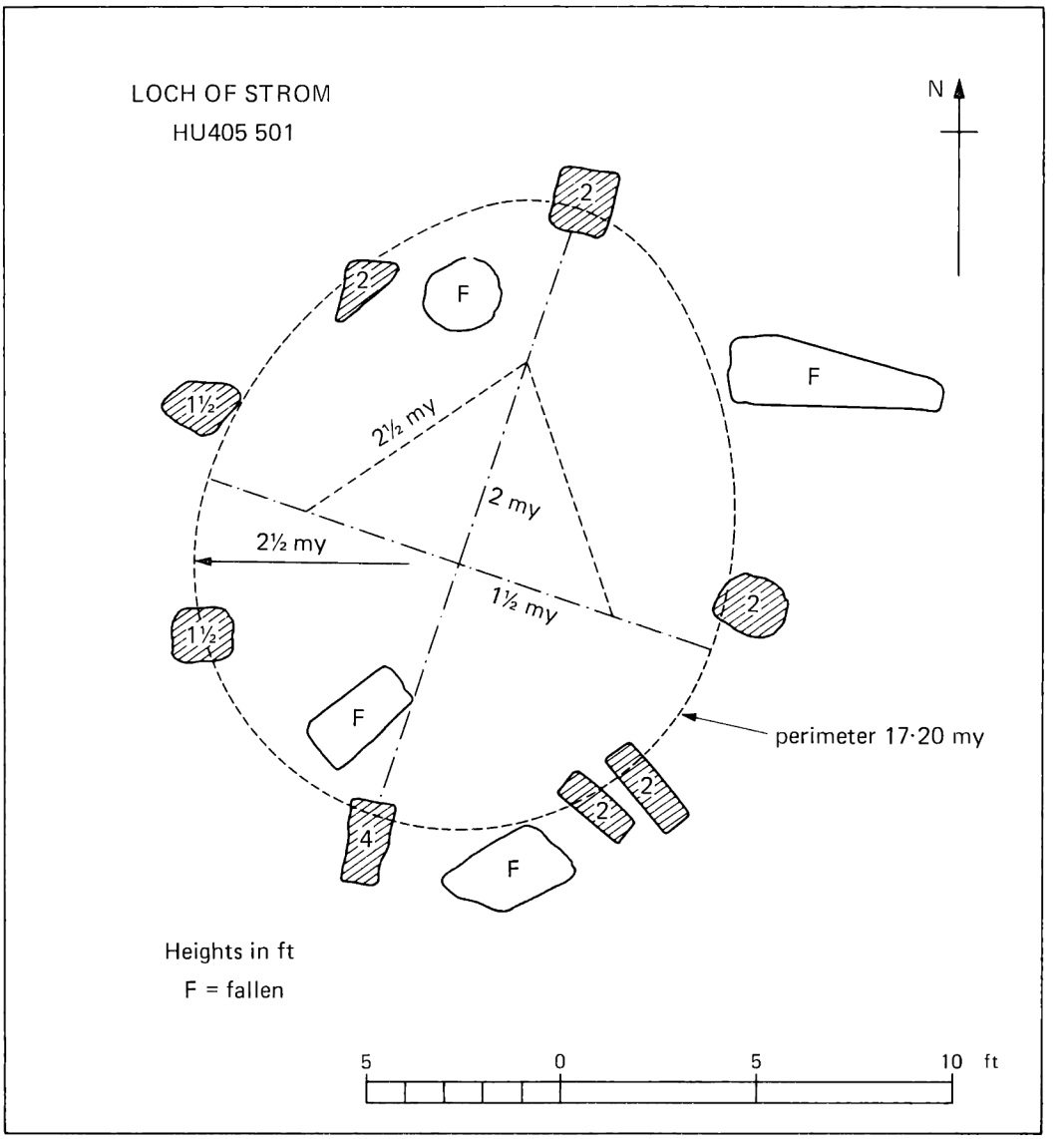

FIG. 4. The ring at Loch of Strom.

Loch of Strom Ring

In Figure 4 we show a survey of a small circle ½ mile south of the north end of Loch of Strom, on the west side of the road (near 403 501). This may be the remains of a circle 6my diameter but on the whole it seems more likely to have been a Type I egg-shaped ring based on two 3, 4, 5 triangles. It seems that the higher stones which were long-shaped in plan had their inner ends on the ring.

The Island of Fetlar

Since the car-ferry schedules did not permit us to cross from the Mainland to Yell and Fetlar and return in the time we had available, we were not able to investigate any sites on Fetlar. The literature refers to various sites, of which none except the Ripple Stone at Leagarth House at Feal seems to us to be Megalithic. They obviously should be investigated to be certain. These sites include the Haltadans circle and the Fiddler's Crus at Gravins, the circles of stones at Erne's Ward, and the Rounds of Tivla at Crussa Field near Balta Sound.[6]

Conclusion

We have shown that Megalithic metrology, geometry and astronomy extended to Shetland. This is important because it shows the extent of the culture and also because it shows the interest being taken in astronomy in the extreme north. From the north end of the island of Unst the Moon would at the time of the major lunar standstill be circumpolar for a day or two each month. This information must have been carried south and would have had an effect on these peoples' philosophical reasoning. Could they have avoided the knowledge that the Earth was a sphere?

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2. C. S. T. Calder, "Report on the Excavation of a Neolithic Temple at Stanydale in the Parish of Sandsting, Shetland", *Proceedings of the Society of Antiquaries of Scotland*, lxxxiv (1952), 185–205.
3. Thom, *Megalithic sites in Britain*, Fig. 4.3.
4. *Ibid.*, Table 9.1 or Fig. 9.2.
5. A. S. Henshall, *The chambered tombs of Scotland*, i (Edinburgh, 1963), 153.
6. The Royal Commission on the Ancient Monuments of Scotland: Twelfth Report, vol. iii: *Inventory of Shetland* (Edinburgh, 1946); J. T. Irvine, "Notes on some Prehistoric Burial-Places and Standing Stones in the Island of Yell, Shetland", *Proceedings of the Society of Antiquaries of Scotland*, xxi (1887), 215–19; C. L. Acland, "On some Stone Circles on the Side of a Hill at the East End of Quendale Bay, Shetland", *ibid.*, 282–4; Henshall, *op. cit.*, 158–519.