THE JOURNAL OF THE
ROYAL ASTRONOMICAL SOCIETY
OF CANADA

Vol. 74, No. 1 FEBRUARY 1980 Whole No. 562

COMMENTS ON THE ASTRONOMICAL ALIGNMENTS AT CALLANISH, LEWIS

BY JEAN-RENÉ ROY
Observatoire astronomique du Mont Mégantic
and
Département de physique, Université Laval, Québec
(Received March 30, 1979; revised September 17, 1979)

ABSTRACT

A brief description of the main megalithic monument at Callanish, Lewis (Scotland) is presented. Claimed alignments (Hawkins 1965) of the double row of stones of the so-called avenue with lunar positions at southern azimuths are questioned. Viewed from the monoliths proposed by Hawkins, the southern horizon is obstructed by an outcrop of rock. Moreover, the avenue stretches on a smooth slope facing north so that one sees the sky only from a few degrees above the horizon.

Introduction. One of the most enthusiastic pioneers of megalithic astronomy was Sir Norman Lockyer. Strongly believing in the existence of prehistorical observatories, Lockyer became interested in the astronomical orientations (see, for example, Lockyer 1909) of a variety of alignments of stone circles (figure 1) and of megalithic tombs in the wider context of other great ancient monuments such as those of Egypt. Nevertheless, using the pages of Nature, of which he was editor, for promoting his wild assertions on megalithic astronomy, Lockyer managed to discredit the field badly.

With the last few decades, however, megalithic astronomy appears to have come of age. This return of credibility is in large part due to the masterful work of two Englishmen, Alexander Thom and his son Archibald S. Thom, who published their studies in three monographs Megalithic Sites of Britain (1967), Megalithic Lunar Observatories (1971) and Megalithic Remains in Britain and Brittany (1978b), and in an extensive


© The Royal Astronomical Society of Canada • Provided by the NASA Astrophysics Data System

The subject of megalithic monuments and its implications have induced a profusion of new works. For general introductory reviews, I suggest the books by Hadingham (1975) and Wood (1978) describing the megalithic monuments of Great Britain and of Brittany and the collective work edited by Krupp (1977). A comprehensive description of stone circles of Great Britain is found in the excellent archaeological surveys published by Burl (1976, 1979). Many commentaries have recently been written about the reality and the nature of astronomical alignments of ancient monuments. The reader can refer to the articles by Heggie (1972, and as reported in Hoskin (1976, p. 219)), Atkinson (1975) and Ruggles (1976). Inevitably several issues remain unsolved, not the least is the significance of megalithic orientations (Freeman and Elmore 1979). The debate among astronomers, archaeologists and statisticians will not end shortly.

In this paper, I wish to elaborate on my impressions following a visit I made to Callanish on Lewis. I described briefly (Roy 1977) how an apparently elegant description of astronomical alignment can be questioned by a visit to a site. I propose to give details here.

*The Megalithic Sites of Callanish.* Northwest of the mainland of Scotland is
the Island of Lewis-and-Harris, the northernmost of the Outer Hebrides, which has been settled since neolithic times (Burl 1976). Many stone circles (see, for example, figure 6), most in view of each other (Cooke et al. 1977), are found in Lewis around a magnificent bay, Loch Roag (figure 2). The main monument of Callanish, known as Tursachan Challanish, is formed by a small ring of stones with a tomb; rows of standing stones and avenues radiate from the ring (figure 3). Although the monument of Callanish is not of the "henge" type such as Stonehenge, it is unique in its shape and complexity. When it was rediscovered in the middle of the 19th century, the monument had to be excavated because it was buried in peat; as told to the author by the local islanders, peat accumulates in that area at a present rate of about one foot per century.

"Even on a drizzling day the stones straggle proudly along their ridge, stark against the western sky, and when the sun is shining the nearby houses hardly intrude upon the imagination which perceives how the setting of loch and hillside, sky and circle blend indivisibly together. Yet archaeologists have been taciturn about Callanish, seeing in it an enigma not easily solved by traditional methods." (Burl 1976, p. 150)

However, astronomers became avid investigators of the site. The existence of many stone rows has attracted the attention of astronomers since the days of Callender (1857) who proposed celestial alignments. Following Callender, Rear Admiral Boyle T. Somerville (1913) surveyed the site at the suggestion of Lockyer. The work at Callanish was pursued further by Hawkins (1965), Thom (1967, 1971) and Cooke et al. (1977).

On the flat top of the headland, the 48 stones forming the ring, the avenue and the arms look like the petrified bones of an ancient dinosaur. Originally, there were probably 75 stones; many were carried away and others are still engulfed in the surrounding peat. The individual members vary in height from about one metre up to 4.5 metres. The avenue (figure 3) is formed by 19 menhirs standing on two parallel lines with an azimuth of roughly 10°. A short line of four stones is aligned east-west (figure 4). A longer line of five menhirs points almost precisely towards the meridian (180°1'); it also lines up with the great menhir, lying within the perimeter of the circle. Another short line of four menhirs is directed northward of east. All these lines radiate from a slightly flattened central circle, 11.3 metres in diameter, of 13 taller stones.

As at many other megalithic sites, alignments along solstitial and equinoctial lines are evident at Callanish; their precision is harder to ascertain because of the rough shape of the weathered stones, displacements of the monoliths since the time of their erection and our ignorance about whether the lower or the upper limbs or the centre of the sun was
FIG. 2—Location of the megalithic monument, known as Tursachan Challanish. Reproduced from The Stone Circles of the British Isles by A. Burl, with permission. Copyright Yale University Press.
used as reference. Other alignments with stars† (Somerville 1913) and the moon (Hawkins 1965, Thom 1971) have been seriously questioned (Heggie, as reported in Hoskin (1976, p. 219); Cooke et al. 1977).

*The Astronomical Alignment of the Avenue at Callanish.* In his study of astronomical alignments of the main monument of Callanish, Hawkins (1965) attached great importance to the latitude of Callanish (latitude: 58°12’N; longitude: 6°45’W) which is just 1.3° south of the arctic circle for

†Stellar orientations are almost impossible to consider because precession can always bring some bright star to fit a given declination if the right date is chosen. We do not know the erection date of megalithic monuments precisely enough. On the other hand, the megalithic constructors may have been aware that stellar indicators could only be temporary and might not have used them.
the moon. Every 18 or 19 years, the full moon at midsummer stands merely one degree above the southern horizon.

Hawkins hence suggested that the line of five menhirs to the south of the circle "points to the rising, transit and setting of the moon along its path at these times, when it appears to come closest to the horizon". Moreover, Hawkins proposed that the fact that the stones of the eastern row of the avenue point to Mount Clisham, the highest peak on Harris, 26 kilometres to the south, reveals an alignment to the setting of the midsummer moon when it is at its southernmost declination (see Hawkins 1965, his figure 4). Although one can treat as doubtful such a limited and vague purpose for the rather precise north-south line of menhirs, these suggestions appear reasonable.

Not long after arriving at Callanish, I discovered that, seen from the stones mentioned by Hawkins for the lunar alignments, the southern horizon is completely obstructed by the intervening ground. An outcrop of natural rock obstructs the view to the south (figures 4 and 5); highly weathered, the outcrop looks like a pile of fragmented boulders. Moreover, the avenue itself stretches on a smooth slope facing north (figure 4); standing at the end of the avenue, the observer sees the sky only from a few degrees above the southern horizon. This possibly explains why Somer-
ville searched for avenue alignments with objects rising or setting in the northern half of the sky; he proposed for example, an alignment with the rising of Capella around 1790 B.C.

Hawkins worked from the one-inch Ordnance Survey map and used data from the old survey made by Somerville. Unfortunately, the 50-foot contour intervals on the one-inch map are too coarse to reveal the presence of the obstructing outcrop south of the monument, and of the small but crucial slope of the hill to the north.

The presence of the outcrop to the south was noticed by Somerville (1913):

"I should add that near the southern end of line C, there is a collection of enormous boulders, so enormous that their heaping together can scarcely be other than natural, though there is a sort of symmetry in their disposition which renders an opposite view permissible. This group of boulders lies exactly on the continuation of line C, and standing on the flat surface their top affords, one can suppose oneself to be at the observing position for an azimuth of true north along the line to the great central menhir."

Hawkins does not mention the presence of this obstruction to the south which invalidates part of his discussion; because he used the survey of Somerville and because he attributed so much importance to astronomical alignments near southern azimuths, this is surprising. To validate the
proposed alignment one would need at least to invoke a change in ground level since the erection of the stones. This is adding another contingency which does not help much to establish the reality of the alignment.

Hawkins (1965) also wrote that "perhaps this alignment of the [setting] moon with the mountain [Mount Clisham] was significant for the Callanish people". Undoubtedly, our ancestors were aware that going a few miles east or west destroyed the alignment; instead, it was the location of Callanish, and not of Mount Clisham, which was significant if at all.

Conclusion. We have shown an example of how shaky the reality of astronomical alignments of megalithic sites remains. Because of their coarse scale, maps do not generally reproduce the conditions at the site and can be of limited use in surveying distant horizons. To avoid these pitfalls, surveys of the sites including indicated horizon profiles are necessary. Such a procedure has been followed by Cooke et al. (1977) who have recently described their work on the Callanish megalithic sites.

Jean-René Roy,
Département de physique,
Université Laval,
Québec, P.Q.
G1K 7P4
References

Atkinson, R. J. C. 1975, J. Hist. Astron., 6, 42.
Freeman, P. R. and Elmore, W. 1979, Archaeoastronomy, No. 1 (suppl. to J. Hist. Astron., 10), S86.
Heggie, D. C. 1972, Antiquity, 46, 43.
Thom, A. 1969, Vistas Astron., 11, 1.