

THE STONE CIRCLES OF KESWICK AND LONG MEG.¹

IT has frequently been shown that the site on which a stone circle was erected was chosen with reference to the elevation of the northern horizon. At Keswick and Long Meg it appears that a further choice was exercised, in that, when possible, natural

The rectangle or chapel involves ten additional stones, and there is a single outlying stone. These are all shown on the plan accompanying the paper, those which appear to have fallen being indicated by cross-hatching. The stones range from 2 to 7 feet in height.

As the result of a preliminary survey, the following alignments were carefully measured:—

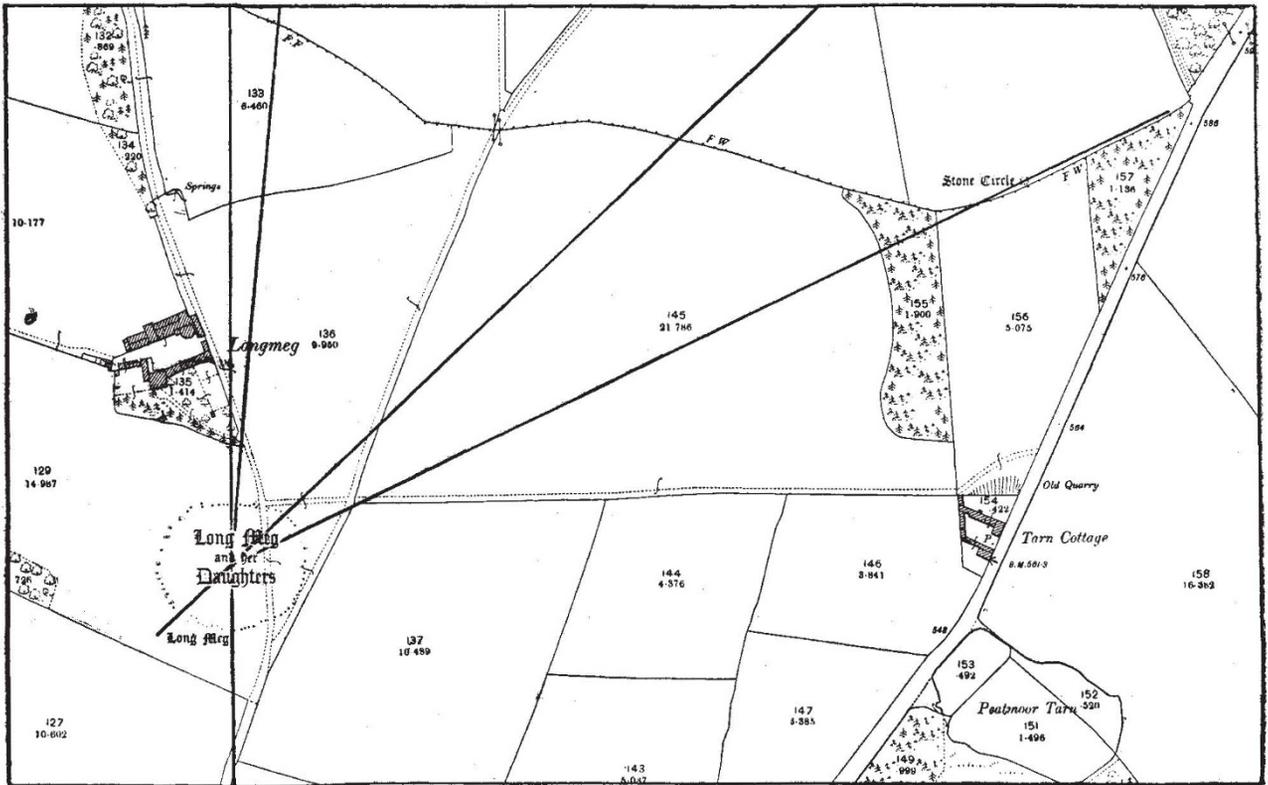


FIG. 1.—Portion of Ordnance Map—Long Meg. From the Proceedings of the University of Durham Philosophical Society.

features were utilised in place of outlying stones or circles. In each case Arcturus rose in a well defined gap between two hills, whilst at Keswick, where the Pleiades were used for the May warning, the alignment passes over the crest of Great Mell Fell.

(1) From the centre of the circle over the tip of the pointed stone, No. 1, to the gap on the horizon between Blencathra (Saddleback) and Skiddaw; (2) from the eccentric centre along the centre line of the chapel, over the tip of the pointed stone, No. 10, to the crest



FIG. 2.—The Chapel or Rectangle, Keswick Circle. From the Proceedings of the University of Durham Philosophical Society.

At Keswick the circle consists of thirty-eight unhewn stones with an internal diameter of about 50 feet.

¹ Abstract of a paper on "Sun and Star Observations at the Stone Circles of Keswick and Long Meg," by Dr. John Morrow (Proceedings of the University of Durham Philosophical Society, vol. iii., part iii, 1908-9).

of Great Mell Fell; (3) from the outlying stone to the centre of the circle, proceeding along the valley of the Greta.

The observed altitudes and azimuths and the calculated declinations are given in Table I.

TABLE I.—Keswick Circle (Lat. 54° 36').

Alignment	Altitude	Azimuth E. of N.	Decl. N.	Object
Circle to Gap (Saddleback-Skiddaw)	2 38	8 25½	37 19	Arcturus rising.
Centre line of chapel to Great Mell Fell	1 42	79 38½	7 6	
Outlying stone to centre of circle	-0 29	64 45½	13 25	May and August Sun.

The Pleiades and Arcturus were the warning stars for the May and August festivals respectively. Of these, the Arcturus alignment is the better preserved, and this gives the date of erection of the circle as about 1400 B.C.

The stones known as "Long Meg and her Daughters" are in the neighbourhood of Little Salkeld, a few miles from Langwalby. There are sixty-eight stones in the circle, and at least one other is buried. The 25-inch Ordnance map gives a fairly accurate plan. The diameters are about 350 feet in an east and west direction, and 305 feet north and south.

Between six and seven hundred yards to the north-east there is a small circle of some 15 feet diameter composed of eleven good-sized stones.

The only shaped stone, Long Meg, is to the south-west of the main circle. It is more than 12 feet in height, and is deeply notched at the top.

The alignments taken were:—

(1) From the centre of the large circle, over a stone which is now recumbent, to a well defined gap on Newbeggin Fell (the only well defined gap on the horizon); (2) from the centre of the large circle to that of the small outlying circle; (3) from Long Meg to the centre of the large circle.

These are dealt with in Table II., and we here also get the date from the Arcturus alignment. This date is 1130 B.C., showing that Long Meg was probably erected after the Keswick circle had fallen into disuse.

TABLE II.—Long Meg (Lat. 54° 43' 20").

Alignment	Altitude	Azimuth E. of N.	Decl. N.	Object
Circle to Gap (Newbeggin Fell)	1 11 20	4 52 20	35 36 35	Arcturus rising.
Large circle to small circle	3 12 0	64 24 40	16 44 35	
Long Meg to centre of large circle	2 40 0	49 37 20	23 53 40	Summer solstice.

Fuller descriptions of the circles, and details of the alignments and the degrees of accuracy to be expected, are given in the original paper in the Proceedings of the University of Durham Philosophical Society. An appendix contains the results of a geological examination of the stones made by Dr. Woolcott. These circles are now brought into line with, and render an additional verification (if such were needed) of, the theories first formulated by Sir Norman Lockyer.

THE FLORA OF SOUTH AFRICA.¹

WHILE ostensibly forming a part of the scientific results of the *Valdivia* expedition of 1898-9, the present volume is in reality much more than this. Indeed, it represents the results of many years of work and experience of the flora of South Africa. For an account of this flora, the editor of these memoirs has been singularly fortunate in securing the cooperation of Dr. Marloth. The author has given to botanists an excellent and comprehensive survey, which for many years must form a standard reference work on

¹ "Wissenschaftliche Ergebnisse der deutschen Tiefsee-Expedition auf dem Dampfer *Valdivia*, 1898-1899." Edited by Prof. Carl Chun. Zweiter Band, Dritter Teil. Das Kapland, insonderheit das Reich der Kapflora, das Waldgebiet und die Karroo, pflanzengeographisch dargestellt. By Rudolf Marloth. Pp. 436; with 20 plates and 8 maps. (Jena: Gustav Fischer, 1908.) Prices 100 marks and 81.50 marks.

the plant-geography of South Africa. The volume contains a full historical summary of the work of previous investigators and travellers, adds much that is new, and supplies a series of vivid descriptions of the peculiar vegetation of this quarter of the globe.

After giving an account (accompanied by a series of maps) of the various floral regions as suggested by earlier plant-geographers, the author proposes a scheme of his own. This resembles, on the whole, that proposed by Dr. Bolus in 1905, but differs in several essentials from any previous scheme. The following are the larger divisions now suggested:—

- (A) The Cape Province of the South-west.
- (B) The Southern Palæo-tropical Provinces, which include:—

- (1) The grass steppes of Rhodesia, the Northern Transvaal, part of Natal, &c.
- (2) The South-eastern Littoral.
- (3) The forests of the South Coast.
- (4) The Central Region, including the Karroo, the Karroid uplands, and Little Namaqualand.
- (5) The Western Littoral.

The essential differences between Dr. Marloth's scheme and earlier ones consist in (a) the more accurate delimitation of the Cape Province, (b) the separation of the forest region of the South Coast from the Cape Province, and (c) the smaller subdivisions which he proposes for the above provinces. Though brief descriptions are given of the others, the only regions treated in detail in this volume are the Cape Province, the South Coast forests, and the Central Region. Each of these may now be briefly noticed.

The Cape Province.—The peculiar systematic character of the Cape flora is, of course, well known. It is exceedingly rich in species, many of which have a very limited range, and includes numerous endemic forms of the orders Proteaceæ, Thymelæaceæ, Ericaceæ, Restionaceæ, &c. The dominant vegetation is a "Macchia," composed of sclerophyllous evergreen shrubs, with small, entire, xerophytic leaves. Mixed with the shrubs, but subordinate to them, are many xerophytic dicotyledonous herbs, together with bulbous and succulent monocotyledons, and many Restionaceæ. This Macchia (see Fig. 1), which somewhat resembles that of the Mediterranean region, forms the real climatic type of vegetation of the Cape region. Other ecological types, e.g. those found in marshes, or on rocky ground, sand dunes, &c., are due to local edaphic influences. The Macchia is typical only where the original vegetation has not been destroyed, and Dr. Marloth is of opinion that if the land were freed from the influence of bush fires and of grazing herds of domestic animals, in fifty years' time it would become entirely covered with a dense, impenetrable Macchia.

Dr. Marloth has explored many of the mountains outside the area of the Cape Province proper, and finds that outliers of the Cape flora occur as "islands" on the higher mountain ridges, both in the Karroo and also in Little Namaqualand. The occurrence of these Cape "islands" is, he considers, largely due to the fact that the ridges are sufficiently high to experience the effects of the rainy south-east winds. Their climate thus more nearly resembles that of the Cape than that of the dry desert plains below them. Besides this, wherever edaphic and other factors permit, there is a reciprocal invasion between Cape and Karroid forms. For instance, even those parts of the Cape region which have the greatest rainfall are not entirely devoid of succulent immigrants from the Karroo. Comparatively few succulents, however, can survive the effects of an exceptionally rainy winter.