# CHAPTER XV

#### THE DARTMOOR AVENUES

In Chapter XI. I referred to the very numerous alignments of stones in Brittany, and I was allowed by Lieutenant Devoir, of the French Navy, to give some of his theodolite observations of the directions along which the stones had been set up.

The conclusion was that we were really dealing with monuments connected with the worship of the sun of the May year, a year which the recent evidence has shown to have been the first used after the length of the year had been determined; thus replacing the lunar unit of time which was in vogue previously, and the use of which is brought home to us by the reputed ages of Methuselah and other biblical personages, who knew no other measurer of time than the moon.

There was also evidence to the effect that in later times solstitial alignments had been added, so that the idea that we were dealing with astronomically oriented rows of stones was greatly strengthened, not to say established.

So long as the Brittany alignments were things of mystery, their origin, as well as that of the more or less similar monuments in Britain, was variously explained;

they were models in stone of armies in battle array, or they represented funeral processions, to mention only two suggestions. I should add that Mr. H. Worth, who has devoted much time to their study, considers that some sepulchral interest attaches to them, though he thinks it may be argued that that was secondary, even as are interments in cathedrals and churches. About burials associated with them, of course, there is no question, for the kistvaens and cairns are there; but my observations suggest that they were added long after the avenues were built, because some cairns *block* avenues. Perhaps a careful study of the modes of burial adopted may throw light on this point.

The equivalents of the Brittany alignments are not common in Britain; they exist in the greatest number on Dartmoor, whither I went recently to study them. The conditions on high Dartmoor are peculiar; dense blinding mists are common, and, moreover, sometimes come on almost without warning. From its conformation the land is full of streams. There are stones everywhere. What I found, therefore, as had others before me, was that as a consequence of the conditions to which I have referred, directions had been indicated by rows of stones for quite other than ceremonial purposes. Here, then, was another possible origin. It was a matter of great importance to discriminate most carefully between these alignments, and to endeavour to sort them out. My special inquiry, of course, was to see if they, like their apparent equivalents in Brittany, could have had an astronomical origin. The first thing to do, then, was to see which might have been erected for worship or which for practical purposes.

#### CHAP.

XV

In doing this there is no difficulty in dealing with extremes. Thus one notable line of large flat stones has been claimed by Messrs. R. N. Worth and R. Burnard as a portion of the Great Fosseway (Rowe's *Perambulation*, third edition, p. 63); it has been traced for eighteen miles from beyond Hameldon nearly to



FIG. 42.—The Southern Avenue at Merrivale, looking East.

Tavistock, the stones being about 2 feet thick and the road 10 feet wide.

There are two notable avenues of upright stones at Merrivale; they are in close connection with a circle, and could have had no practical use. These stones, then, we may claim as representing the opposite extreme of the Fosseway and as suggesting an astronomical, as opposed to a practical, use; the adjacent circle, of course greatly strengthens this view.

It is between these extremes that difficulties may arise, but the verdict can, in a great many cases at all events, be settled without any very great hesitation, especially where practical or astronomical uselessness can be established. But even here care is necessary, as I shall show.

The stones now in question, originally upright, are variously called avenues, rows, alignments or parallelithons. Their study dates from 1827, when Rowe and Colonel Hamilton Smith examined those at Merrivale (Rowe, op. cit., p. 31). Their number has increased with every careful study of any part of the moor, and doubtless many are still unmapped.<sup>1</sup> The late Mr. R. N. Worth, of Plymouth, and his son, Mr. H. Worth, have given great attention to these monuments, and the former communicated a paper on them to the Devonshire Association for the Advancement of Science in 1892 (*Trans.*, xxv. pp. 387–417).

A word of caution must be said before I proceed. We must not take for granted that the stone-rows are now as they left the hands of the builders. The disastrous carelessness of the Government in the matter of our national antiquities is, I am locally informed, admirably imitated by the Devonshire County and other lesser councils, and, indeed, by anybody who has a road to mend or a wall to build. On this account, any of the rows may once have been much longer and with an obvious practical use; and those which now appear

<sup>1</sup> On June 15, 1905, that excellent guide of the Chagford part of the moor, Mr. S. Perrott, showed me an avenue (Azimuth N.  $20^{\circ}$  E. true) near Hurston Ridge which is not given in the 1-inch map.

to be far removed from circles may once have been used for sacred processions at shrines which have disappeared.

Again, the rows of stones we are now considering must not be confounded with the "track lines" or "boundary banks" which are so numerous on Dartmoor, and are represented in Wiltshire according to Sir R. C. Hoare; these serve for bounds and pathways, and for connecting and enclosing fields or houses.

Dealing, then, with stone rows or avenues, which may be single, double, or multiple; any which are very long and crooked, following several directions, are certainly not astronomical; and it is easy to see in some cases that they might have been useful guides at night or in mist in difficult country with streams to cross. This possible utility must not be judged wholly by the present conformation of the ground or the present beds of streams.

For multiple avenues it is hard to find practical uses such as the above, and we know how such avenues were used in Brittany for sun worship. Mr. Baring Gould considers there were eight rows in an avenue on Challacombe Down 528 feet long; of these only three rows remain, the others being represented by single stones here and there (Rowe, p. 33). I shall have something to say about this avenue further on.

Although, as I have said, long rows bending in various directions are not likely to have had an astronomical origin, it must not be assumed that all astronomical avenues must be *exactly* straight. This, of course, would be true for level ground, but if the avenue has to pass over ridges and furrows, the varying

XV

height of the horizon must be reckoned with, and therefore the azimuth of the avenue at any point along it.

I think it possible that in the Stalldon Moor row we have the mixture of religious and practical intention at which I have before hinted. Both Mr. Lukis and Mr. Hansford Worth have studied this monument, which is two miles and a quarter long. There is a circle at the south end about 60 feet in diameter, while at its northern end there is a cairn.

Where the line starts from the circle the direction of the row is parallel to many sight-lines in Cornwall, and Arcturus would rise in the azimuth indicated. But this direction is afterwards given up for one which leads towards an important collection of hut circles, and it crosses the Erme, no doubt at the most convenient spot. More to the north it crosses another stream and the bog of Red Lake. All this is surely practical enough, although the way indicated might have been followed by the priests of the hut circles to the stone circle to prepare the morning sacrifice and go through the ritual.

But there is still another method of discrimination. If any of these avenues were used at all for purposes of worship, their azimuths should agree with those already found in connection with circles in other parts of Britain, for we need not postulate a special race with a special cult limited to Dartmoor; and in my inquiries what I have to do is to consider the general question of orientation wherever traces of it can be found. The more the evidences coincide the better it is for the argument, while variations afford valuable tests.

Now, speaking very generally (I have not yet compared all my numerous notes), in Cornwall the chief alignments from the circles there are with azimuths N.  $10^{\circ}-20^{\circ}$  E. watching the rise of the clock-star, N.  $64^{\circ}-68^{\circ}$  E. watching the rise of the May sun, N.  $75^{\circ}-82^{\circ}$  E. watching the rise of the Pleiades. The variation in the azimuths is largely due to the different heights of the horizon towards which the sight-lines are directed.

The conclusion I have come to is that these alignments, depending upon circles and menhirs in Cornwall, are all well represented on Dartmoor associated with the avenues; and further, so far as I have learned at present, in the case of the avenues connected with circles, there are not many alignments I have not met with in connection with circles in Cornwall and elsewhere.

This is not only a *prima facie* argument in favour of the astronomical use underlying the structures, but it is against the burial theory, for certainly there must have been burials in Cornwall.

In order, therefore, to proceed with the utmost caution, I limit myself in the first instance to the above azimuths, and will begin by applying a test which should be a rigid one.

If the avenues on Dartmoor had to deal with the same practices and cults as did the circles in Cornwall, they ought to prove themselves to have been in use at *about* the same time, and from this point of view the investigation of the avenues becomes of very great importance, because of the destruction of circles and menhirs which has been going on, and is still going on, on Dartmoor. We have circles without menhirs

and menhirs without circles, so that the azimuths of the avenues alone remain to give us any chance of dating the monuments if they were used in connection with star worship. The case is far different in Cornwall, where both circles and menhirs have in many cases been spared.

On Dartmoor, where in some cases the menhirs still remain, they have been annexed as crosses and perhaps as boundary stones, and squared and initialed; hence the Ordnance surveyors have been misled, and they are not shown as ancient stones on the map. In some cases the azimuth of the stones suggests that this has been the sequence of events.

It will be seen from the above that I have not tackled a question full of pitfalls without due caution, and this care was all the more necessary as the avenues have for long been the meeting ground of the friends and foes of what Rowe calls "Druidical speculations"; even yet the war rages, and my writing and Lieut. Devoir's observing touching the similar but grander avenues of Brittany have so far been all in vain; chiefly, I think, because no discrimination has been considered possible between different uses of avenues, and because the statements made by archæologists as to their direction have been quite useless to anybody in consequence of their vagueness, and last of all because the recent work on the Brittany remains is little known.

I began my acquaintance with the Dartmoor monuments by visiting Merrivale, and the result of my inquiries there left absolutely no doubt whatever on my mind. I was armed, thanks to the kindness of Colonel Johnston, the Director of the Ordnance Survey, with the 25-inch map, while Mr. Hansford Worth had been so good as to send me one showing his special survey.

The Merrivale avenues (lat.  $50^{\circ} 33' 15''$ ) are composed of two double rows, roughly with the azimuth N.  $82^{\circ}$  E.; the northern row is shorter than the other. Rowe, in his original description (1830), makes the northern 1143 feet long; they are not quite parallel, and the southern row has a distinct "kink" or change of direction in it at about the centre. The stones are mostly 2 or 3 feet high, and in each row they are about 3 feet apart; the distance between the rows is about 80 feet.

I have before pointed out (p. 149) that an avenue directed to the rising place of a star, if it is erected over undulating ground, cannot be straight. I may now mention another apparent paradox. If two avenues are directed to the rising place of the same star *at different times*, they cannot be parallel. It is not a little curious that absence of parallelism has been used against avenues having had an astronomical use !

Both the Ordnance surveyors and Mr. Worth have shown the want of parallelism of the two avenues, and Mr. Worth has noted the kink in the southern one. The height of the horizon, as determined from my measures, is  $3^{\circ}$  18'. The results of these inquiries, assuming the Pleiades to have been observed warning May morning, are as follows :—

Azimuth.	Authority.	N. Declination.	Date B.C.
N. 83 <sup>°</sup> 15 E.	Worth	<b>6</b> 47 47	1710
82.30	Worth	$7 \ 16 \ 20$	1630
82.10	Ordnance	$7 \ 32 \ 0$	1580
80.40	Worth	$8\ 26\ 0$	1420
80.30	Ordnance	8 30 0	1400

XV

To simplify matters we may deal with the Ordnance values and neglect the small change of direction in the southern avenue. We have, then, the two dates 1580 B.C. and 1420 B.C. for the two avenues. The argument for the Pleiades is strengthened by the fact that at Athens the Hecatompedon was oriented to these stars in 1495 B.C. according to Mr. Penrose's determination of the azimuth.

Now this is not the first time I have referred to

IIII TATLETE N.80°30 But Circli Etirn · Menolith

FIG. 43.—Plan, from the Ordnance Map, showing the avenues, circle and stones at Merrivale, with their azimuths.

avenues in these notes. The azimuth of one at Stonehenge was used to fix the date at which sun worship went on there. That avenue, unlike the Dartmoor ones, was built of earth, and it is not alone. There is another nearly two miles long called the Cursus. So far, I have found no solstitial worship on Dartmoor, so there are no avenues parallel to the one at Stonehenge leading N.E. from the temple. But how about the other ? It is roughly parallel to the avenues at XV

Merrivale, and I think, therefore, was, like them, used as a processional road, a via sacra, to watch the rising of the Pleiades.

I said roughly parallel; its azimuth is about the same  $(N. 82^{\circ} \text{ E. roughly})$ ; but the horizon is only about 1° high; it was therefore in use before those at



FIG. 44.—Reprint of Ordnance Map showing that the Cursus at Stonehenge is nearly parallel to the Merrivale Avenue. The azimuth is 82° and not 84° as shown in the figure.

Merrivale; the exact date of use must wait for theodolite values of the height of the horizon, but in the meantime we can see from the above estimates that the declination of the Pleiades was about N. 5° 28' 30" and the date of use 1950 B.C., that is some 300 years before the solstitial restoration.

Mr. Worth's survey gives another line of stones. It is undoubtedly, I think, an ancient line, although it is not shown in the Ordnance map, a clear indication of

CHAP. XV

the difficulty of discriminating these avenues on land cumbered with stones in all directions. Its azimuth is N. 24° 25' E., and the height of the horizon 5° 10'. This gives us Arcturus at the date 1860 B.C., showing that, as at the Hurlers, Arcturus was used as a clockstar. Hence a possible *astronomical* use is evident, while this row, like the others, could have been of no *practical* use to anybody. It is interesting to note that this single row of stones is older than the double ones; this seems natural.

It is worth while to say a word as to the different treatment of the ends of the south avenue now that it seems probable that it was used to watch the rising of the Pleiades. At the east end there is what archæologists term a "blocking stone"; these observations suggest that it was really a *sighting* stone. At the west end such a stone is absent, but the final stones in the avenue are longer than the rest. This may help us in the true direction of the sight-lines in other avenues; and, indeed, I shall show in the sequel that this consideration affords a criterion which, in the cases I have come across, is entirely in harmony with others.

# CHAPTER XVI

### THE DARTMOOR AVENUES (continued)

My inquiries began at Merrivale because there is a circle associated with the avenues a little to the south of the west end of the longest; and again nearly, or quite, south of this there is a fine menhir, possibly used to give a north-south line. There is another menhir given on the Ordnance map, azimuth N. 70° 30' E., which, with hills 3° high, points out roughly the place of sunrise from the circle in May (April 29). Although this stone has been squared and initialed, I think I am justified in claiming it as an ancient monument. There is still another, azimuth N. 83° E., giving a line from the circle almost parallel to the avenue. I hope some local archæologist will examine it, for if ancient it will tell us whether the N. avenue or the circle was built first, a point of which it is difficult to overrate the importance, as it will show the strict relationship between the astronomy of the avenues and that of the circle, and we can now. I think, deal with the astronomical use of circles after the results obtained at Stonehenge, Stenness and the Hurlers as an accepted fact. With the above approximate values

the date comes out 1750 B.C., the declination of the Pleiades being N.  $6^{\circ}$  35'.

I now pass on from Merrivale as an example of those avenues the direction of which lies somewhere in the E.-W. direction. Others which I have not seen, given by Rowe, are at Assacombe, Drizzlecombe and Trowlesworthy; to these Mr. Worth adds Harter or Har Tor (or Black Tor).

The avenues which lie nearly N. and S. are more numerous. Rowe gives the following:—Fernworthy, Challacombe, Trowlesworthy, Stalldon Moor, Battendon, Hook Lake, and Tristis Rock. Of these I have visited the first two, as well as one on Shovel Down not named by Rowe, and the next two I have studied on the 6-inch Ordnance map.

Fernworthy (lat.  $50^{\circ}$  38').—Here are two avenues, one with azimuth N.  $15^{\circ}$  45' E., hills  $1^{\circ}$  15'. There is a sighting stone at the N. end. We appear to be dealing with Arcturus as clock-star 1610 B.C. This is about the date of the erection of the N. avenue at Merrivale.

The second avenue has its sighting stone built into a wall at the south end. Looking south along the avenue, the conditions are azimuth S.  $8^{\circ} 42'$  W., hills  $3^{\circ} 30'$ .

Both these avenues are aligned on points within, but not at the centre of, the circle.

Challacombe (lat.  $50^{\circ}$  36').—This is a case of a triple avenue, probably the remains of eight rows, in a depression between two hills, Challacombe Down and Warrington. There is no circle. The azimuth is  $23^{\circ}$  37' N.W. or S.E., according to direction. The northern end has been destroyed by an old stream work; there is no blocking stone to the south on

CHAP.

either of the remaining avenues, but one large menhir

terminates one row of stones. The others may have been removed. So it is probable that the alignment was to the north. If so, we are dealing with the setting of Arcturus, warning the summer solstice sunrise in 1860 B.C. To the S. the hills are 4° 48', to the N. 4° 50'.

To this result some importance must be attached, first, because it brings us into presence of the cult of the solstitial year, secondly, because it shows us that the system most in vogue in Brittany was introduced in relation to that year. In Brittany, as I have before shown, the complicated alignments, there are 11 parallel rows at Le Ménac (p. 99) (there were 8 parallel rows at Challacombe), were set up to watch the May and August sunrises, and the solstitial alignments came afterwards. The Brittany May alignments, therefore, were probably used long before 1860 B.C., the date we have found for Challacombe, where not the sunrise but the setting star which gave warning of it was observed.



the extreme right

It is worth while to point out that at Challacombe, as elsewhere, the priest-astronomers so

XVI

located their monuments that the nearly circumpolar stars which were so useful to them should rise over an horizon of some angular height. In this way the directionlines would be available for a longer period of time, for near the north point the change of azimuth with change in the declination of the star observed is very rapid.

Shovel Down, near Batworthy (lat. 50° 39' 20").—A group of five rows of stones. four double, one single, with two sets of azimuths.

One set gives az. 22°, 25°, and 28°. They seem to be associated. I will call them A, B, and C. A is directed to the circle on Godleigh Common. Its ends are free. B is a single line of stones to the E. of the triple circle, about which more presently. It is not marked on the Ordnance map; its ends are also free. C has its south end blocked, I think in later times, by a kistvaen. The astronomical direction may be, therefore, either N.W. or S.E. We find a probable use in the N.W. quadrant, as at Challacombe, Arcturus setting at daybreak as a warner of the summer solstice.

The height of hills is 46'; we have then :--

Az.	N. Dec.	Star.	Date.
N. $22^{\circ}$ W.	36' 19' 40''	Arcturus	1210 в.с.
N. $25^{\circ}$ W.	$35^\circ~23'~20''$	23	1040 "
<b>N.</b> $28^{\circ}$ W.	$34^\circ~19'~30''$	2.2	850 "

Adjacent to A, B, C, is another avenue, which I will call D. Unlike the others, its northern end points  $2^{\circ}$  E. of N. Its southern end is blocked by a remarkable triple circle, the end of the avenue close to it being defined by two tall terminal stones. We are justified, then, in thinking that its orientation was towards the north; the height of the horizon I measured as 45'. It

CHAP.

may have been an attempt to mark the N. point of the horizon.

XVI

The triple circle to which I have referred is not an ordinary circle. I believe it to be a later added, much embellished, cairn. According to Ormerod, the diameters are 26, 20, and 3 feet, and there are three small stones at the centre.

All the above avenues are on the slope of the hill to the north. On the south slope we find the longest of all, as shown on the Ordnance map survey of 1885. There is a "long stone" in its centre, and at the southern end was formerly a cromlech, the "three boys." Part of this avenue, and two of the three "boys," have been taken to build a wall. The long stone remains, because it is a boundary stone!

The azimuth is  $2^{\circ} 30'$  W. of north or E. of south. Looking N. from the long stone, the height of the horizon is 2° 30'. I think this avenue was an attempt to mark the S. point.

Trowlesworthy (lat. 50° 27′ 30″).—The remains here are most interesting. This is the only monument on Dartmoor in which I have so far traced any attempt to locate the sun's place at rising either for the May or solstitial year. But I will deal with the N.-S. avenue first, as it is this feature which associates it with Fernworthy and Challacombe.

As at Merrivale, the avenue has a decided "kink" or change of direction. The facts as gathered from the 6-inch map are as follows :----

Star. Date. Az. Hills. Dec. N. S. part of Avenue N. 7° E. 2° 52′ 41° 29′ 10″ Arcturus 2130 B.C. N. " " N. 12° E. 2° 52′ 41° 6′ 20″ 2080 в.с. • •

This date is very nearly that of the use of the S. circle at the Hurlers, and it is early for Dartmoor; but it is quite possible that local observations on an associated avenue a little to the west of the circle which terminates the N.-S. avenue will justify it.



FIG. 46.—The sight-lines at Trowlesworthy, showing high northern azimuths. From the Ordnance map.

This is not far from parallel to that at Merrivale, but its northern azimuth is greater, so that if it turns out to have been aligned on the Pleiades its date will be some time before that of Merrivale. that is, before 1580 B.C. I can say nothing more about it till I have visited it. The new features to which I have referred are two

## 162

CHAP.

XVI

tumuli which in all probability represent more recent additions to the original scheme of observation, as we have found at Stenness, and show that Trowlesworthy was for long one of the chief centres of worship on Dartmoor. Their azimuths are S. 64° E. and S. 49° W., dealing, therefore, with the May year sunrises in November and February and the solstitial sunset in December. It is probable that, as at the Hurlers. tumuli were used instead of stones not earlier than 1900 в.с.

Stalldon Moor (lat. 50° 27′ 45″) I have already incidentally referred to. The azimuth of the stone row as it leaves the circle, not from its centre as I read the 6-inch map, is N. 3° E.; as the azimuth gradually increases for a time, we may be dealing with Arcturus, but local observation is necessary.

The differences between the Cornish and Dartmoor monuments give much food for thought, and it is to be hoped that they will be carefully studied by future students of orientation, as so many questions are suggested. I will refer to some of them.

(1) Are the avenues, chiefly consisting of two rows of stones, a reflection of the sphinx avenues of Egypt? and, if so, how can the intensification of them on Dartmoor be explained ?

(2) Was there a double worship going on in the avenues and the circles at the same time? If not, why were the former not aligned on the circles? On a dead level, of course, if the avenues were aligned on the centre of the circle towards the rising or setting of the sun or a star, the procession in the via sacra would block the view of those in the circle. We have the

M 2

avenue at Stonehenge undoubtedly aligned on the centre of the circle, but there the naos was on an eminence, so that the procession in the avenue was always below the level of the horizon, and so did not block the view.

(3) Do all the cairns and cists in the avenues represent later additions, so late, indeed, that they may have been added after the avenues had ceased to be used for ceremonial purposes? The cairn at nearly the central point of the S. avenue at Merrivale was certainly not there as a part of the structure when the avenue was first used as a via sacra for observing the rising of the Pleiades. I have always held that these ancient temples, and even their attendant long and chambered barrows, were for the living and not for the dead, and this view has been strengthened by what I have observed on Dartmoor.

There was good reason for burials after the sacred nature of the spot had been established, and they may have taken place at any time since; the most probable time being after 1000 B.C. up to a date as recent as archæologists may consider probable.

Mr. Worth, whose long labours on the Dartmoor avenues give such importance to his opinions, objects to the astronomical use of those avenues because there are so many of them; he informs me that he knows of 50; I think this objection may be considered less valid if the avenues show that they were dedicated to different uses, some practical and others sacred, at different times of the year. For instance, Challacombe is not a duplicate of Merrivale; one is solstitial, the other deals with the May year; and a complete

XVI

examination of them-I have only worked on the fringe -may show other differences having the same bearing. In favour of the astronomical view it must be borne in mind that the results obtained in Devon and Cornwall are remarkably similar, and the dates are roughly the same. Among the whole host of heaven from which objectors urge it is free for me to select any star I choose, at present only six stars have been considered, two of which were certainly used, as in Egypt, as clock-stars as they just dipped below the northern horizon, and other two afterwards at Athens; and these six stars are shown by nothing more recondite than an inspection of a precessional globe to have been precisely the stars, the "morning stars," wanted by the priestastronomers who wished to be prepared for the instant of sunrise at the critical points of the May or solstitial year.