

**A change in climate was the main reason for the unsustainability of Permanent human settlement on Dartmoor at the end of the Bronze Age**

**Abstract:**

The area that we now call Dartmoor is a site of huge historical importance, with over 500 sites referenced by Jeremy Butler and over 3000 stone and 6000 wooden round houses estimated by Pettitt<sup>1</sup>. The general consensus is that there are many more sites to be discovered, with extensive ancient field boundaries or Reaves dividing up the land, hinting at the type of existence that these people lead. However, radiocarbon dating has shown that most of the Reaves were built within a 200 year period; and only in use for between 200 and 400 years. The abandonment of the Reaves and the upland moor has been put down to Geographical issues such as a change in climate at the time, a drop in temperature and an increase in dampness, however there are other more minor factors that also contribute to the departure of man from the moor, and the current lack of extensive settlement in the area today.

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Recent research into Geographical issues such as the effects of climate change have revealed that climatic deterioration has resulted in numerous and far-reaching consequences for human populations; and no-where is this more evident than in the area we now call Dartmoor and the abandonment of the Reaves, which covers over 39 square miles. The accepted model of the subdivision of the landscape on the moor is one of enclosing areas of land using a coaxial system of banks, with associated roundhouses, and we can pinpoint that this occurred over a 200 year period around 1600 BC<sup>2</sup>. However, this cannot be the first date of human activity on the moor, as they must before this subdivision could occur someone must have cleared the heavily wooded landscape<sup>3</sup>. Dartmoor was an important centre of prehistoric life; as the number of roundhouses, cairns and standing stones demonstrate as can be seen in Figure 1, yet there was very little human activity there later in History. The Domesday Book of 1086 does record some small settlements, such as Hundatora, modern Great Houndtor<sup>4</sup>; but these tin mining villages were small in both size and number. Today only 33,000 people are permanent residents in the Dartmoor National Park, an area of 368 square miles, as can be seen in Figure 2 (0.35 people per hectare compared with a Devon average of 1.07)<sup>5</sup>; and the majority live in the lowland areas. Today Dartmoor is considered marginal land; however, the evidence shows that in the Bronze age people were able to exist here, farming and raising livestock. The titular hypothesis attempts to explain how Geographical issues account for the inconsistency in human habitation of Dartmoor through History.

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<sup>1</sup>Paul Pettit 1974: Prehistoric Dartmoor

<sup>2</sup>Andrew Fleming 1988: The Dartmoor Reaves: investigating Prehistoric Land Divisions

<sup>3</sup>Phil Newman 2011: The Field Archaeology of Dartmoor

<sup>4</sup><http://www.domesdaybook.co.uk/devonshire3.html#houndtor>

<sup>5</sup><http://www.neighbourhood.statistics.gov.uk/dissemination/LeadAreaSearch.do?a=3&r=1&i=1001&m=0&s=1347486342942&enc=1&areaSearchText=Devon&areaSearchType=13&extendedList=true&searchAreas=>

The onset of human activity on the moor took place at approximately 4000BC; however we do not know whether this was undertaken by people with sedentary lifestyles or roaming hunters who gradually began farming after an initial colonisation period. It is clear that this wooded area of granite hills was favourable for hunting due to the large amounts of finds such as flint arrow tips found dating from this period. Pollen analysis by Maguire and Caseldine suggest that any land clearances of the naturally abundant Oak and Mountain Ash (which can still be seen in wooded areas of the moor today such as Wistman's Wood) that took place at this point were on a small scale and short lived<sup>6</sup>. This suggests that people who were living in this area were doing so on a small scale, and perhaps Dartmoor was not their permanent residence; seasonal occupation seems more likely.

Around 2500BC there is evidence for more people living in the upland areas, with the construction of more than 70 stone rows (as determined by, in some cases controversial, radiocarbon dating)<sup>7</sup>, more closely spaced than any previous constructions elsewhere on the Moor, perhaps showing that there was pressure and competition for space. As with other areas of upland Britain, it appears that there was a greater level of human activity in the Bronze Age than before. Furthermore, the landscape was gradually becoming more open. Whilst the vegetation of Dartmoor is considered natural by many, it is actually an anthropogenic change, as land clearance has occurred throughout History to make way for farming, most famously by the Victorians. Pollen analysis can help pinpoint the approximate time of first human settlement on Dartmoor at around 2500BC<sup>4</sup>, if not first activity, due to the process of clearing the land and its replacement by bracken and heather. This suggests that at sites such as Cholwichtown (250m above sea level) a clearing was made in a predominantly Oak forest, with evidence of cereal crop growth and areas suitable for pasture along with other ground flora. This is one of the earliest signs of concerted farming efforts on the upland moor; as this clearing was clearly open for some time. However, farming may have been taking place here before this, as pollen analysis of Dartmoor has not been hugely extensive. In the northern part of the moor, there is evidence for a patchy landscape, with increases in open ground and a growth of peat bogs.

This all shows that around 2500BC, the upland moor was developing as farmland for pasture and cereal crop growth. However, it is difficult to determine whether this land was only seasonally exploited, or was a permanent settlement for these people. Of all the known Bronze Age settlements, Fleming can only find two enclosures that suggest seasonal occupation; and argues that the number of stone circles and burials shows Dartmoor to be too important a landscape to abandon for half the year<sup>1</sup>. The prevalence of 'perfect' circles (John Barnatt)<sup>7</sup>, which are stone circles that are perfectly round and therefore must have been constructed with the aid of a rope and peg and are rarely found in such high concentrations further convinces Barnatt that seasonal occupation did not occur at the time of their construction. The significant size of the Reave systems which were constructed around 1700BC<sup>1</sup> and the potential loss of these systems to other groups of people whilst off the moor would also be an incentive for us to believe that these sites were permanently occupied. Around this time there is more evidence by means of pollen analysis for cereal crop growth, which suggests that prehistoric humans did not consider the land to be as marginal as we do today. However, after the abandonment of the Reaves there is still evidence by the way of pollen

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<sup>2</sup> Andrew Fleming 1988: The Dartmoor Reaves: investigating Prehistoric Land Divisions

<sup>6</sup> Matthew J. Amesbury, Dan J. Charman, Ralph M. Fyfe, Peter G. Langdon, Steve West 2007: Bronze Age Upland Settlement Decline in South West England: Testing The Climate Change Hypothesis. *Journal of Archaeological Science*

<sup>7</sup> Jeremy Butler 1991: Dartmoor Atlas of Antiquities Volume Five – The Second Millennium B.C.

analysis that the landscape was still open and good pastoral land, hinting at human activity in the area. This means that although the Reaves were abandoned, the moor, seasonally at least, was not.

The levels of Reave construction and settlement along with the religious significance of the moor indicated by the prevalence of stone rows and circles suggest that the people who built these landmarks were confident of being able to lead a comfortable existence on this upland area. Grimspound is evidence for this; a well-constructed enclosure hinting at permanent habitation, with 24 small stone huts, with a wall encompassing these (discussed by Butler)<sup>8</sup>. Yet radiocarbon dating shows that many of these sites were only occupied for between 300-400 years<sup>1</sup> or marginally longer, leading to an implied date of abandonment between 1400 and 1200BC<sup>4</sup>. If this was the case, then it seems that there must have been some unforeseen and significant changes that had such wide reaching effects on the population that caused the abandonment of the Reaves and the moor as a year-round home at the end of the Bronze Age.

There have been extensive palaeoclimatic reconstructions from the Reave period in Scotland (Barber and Charman 2003) and Northern England (Hughes 2000)<sup>9</sup>, yet none in the southwest. However, it is useful to try to combine these two studies, along with core samples from Dartmoor to create a climactic map of the UK during this period as done by M.J. Amesbury<sup>4</sup>. Analysis on core samples taken on Dartmoor reveals layers of differing moss types, each of which is more prevalent in their own preferred climactic conditions, and it is possible to date these bands by radiocarbon dating. There are therefore correlations that can be drawn between Dartmoor's climate over the centuries and that of other areas of the UK. However, this evidence is not conclusive; climatic events occur in some areas that there is no evidence for in others, though this could be down to errors in analysis or collection, as well as being actual differences in the climate of the UK. However, there are some conclusions that can be drawn from this process.

The results from the analysis of the Dartmoor core samples and show a period when the climate was mild and consistent around 2000 to 1400BC<sup>4</sup> on the moor and throughout the UK, which is consistent with the reave construction period of approximately 1700BC<sup>1</sup>. Although this warm spell occurred after the initial human exploitation of the Moor (as shown by the pollen analysis), it may have been a catalyst for them to give up seasonal occupation and settle permanently in the area, hence the construction of the Reaves. Furthermore, this is followed by a rapid deterioration to a colder and wetter climate around 1400 and 1150BC, consistent with the abandonment of the Reaves<sup>4</sup>. A climatic shift would certainly be enough to drive people from the area, especially during the winter, and the connection in the dates supports Fleming's original hypothesis for what caused the field systems to be abandoned<sup>1</sup>; that it was down to a change in climate (History has shown us the effects of climatic changes on the human population, for example during the Little Ice Age of 1300-1850<sup>10</sup>). However the analysis does not show a shift to a climate that was inhospitable during the summer months, which correlates with the pollen analysis which shows evidence of seasonal occupation on the Moor due to the continued existence of upland grazing pastures. This does not

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<sup>8</sup> Jeremy Butler 1991: Dartmoor Atlas of Antiquities Volume One – The East

<sup>9</sup> C. J. Caseldine, J. M. Hatton: Into The Mists: Thoughts on the Prehistoric and Historic Environmental History of Dartmoor

<sup>10</sup> Brian Fagin 2000: The Little Ice Age: How Climate Made History 1300-1850

affect that connection between the climatic shift and the abandonment of the Reaves, but it does show that settlement, at least for a portion of the year, was still possible with this adjustment in climate.

This climatic shift is not the only change that occurred on the moor at this time that may have contributed to the abandonment of permanent settlement in the area at the end of the Bronze Age. Dartmoor is home to many types of sphagnum moss, which due to phenolic compounds that can be found in the genus's cell walls that leads to anaerobic decomposition, does not decay quickly. This moss is a key constituent in the Moor's peat bogs, which according to core sample and pollen analysis were spreading on Dartmoor during the Bronze Age. This would have detrimental effects on the quality of the land for cereal crop growth, which may have led the human inhabitants to move away from the areas affected. This may have been occurring as a direct result of anthropogenic activities such as the deforestation that occurred at the time as seen in the pollen analysis<sup>11</sup>. The reduction in the number of trees to make way for grazing pasture and crop growth creates more space where the mosses can thrive, which in turn leads to the creating of peat bogs.

Human activities may have had other unintended consequences that may have contributed to the abandonment of the Reaves and permanent settlement on the Moor. Peat mosses can also contribute to soil acidification by absorbing alkaline anions and releasing acidic hydrogen cations; and deforestation can lead to leaching of the soil; all of the nutrients being washed out. This may have forced the human population to move around the moor, as Simmonds suggests that 'slash and burn' agriculture was in use on Dartmoor. This process, as can be seen by contemporary examples in the Rainforests of Brazil, is not sustainable, as the rain washes away nutrients in the soil, leading to the continual movement of people through the Rainforest in search of more fertile land. This may have been eased by the use of crop rotation, but the earliest known examples of this are in Roman literature, but it is conceivable that Bronze Age farmers may have stumbled across it as a technique. The problems of 'slash and burn' agricultural methods coupled with the spreading peat bogs were perhaps contributing factors in humans moving in search of more sustainable areas to farm closer to sea level. It therefore can be argued that some of the factors that pushed people off Dartmoor were of human origin.

These were likely to be contributing factors in the process of the abandonment of the upland areas as permanent homes. However, they were not the main factors. There are vast areas of the Moor that show little or no sign of human activity; areas that would have been just as good for grazing or crop growth when cleared of the trees as with areas that were settled earlier. These areas were not exploited, so there was scope for humans to extend further over the moor if peat bog growth or lack of soil nutrition were serious problems for the residents. Furthermore, they lived in permanent structures for a few centuries, showing that they were able to gain a living for a long period of time in the same area. There must be other factors that forced them to abandon these

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<sup>11</sup>James Barber: *Early Men* (Crispen Gill: Dartmoor: A New Study)

permanent bases and move off the Moor, returning seasonally. Furthermore the coincidence in timing between other Geographical occurrences such as changes in climate and the abandonment of the Reaves strongly suggests that climate was the main factor. They moved to Dartmoor during a warm and dry period with consistent weather; and were forced to move away once this weather deteriorated, becoming wetter and colder. I therefore accept the titular hypothesis that: 'a change in climate was the main reason for the unsustainability of permanent human settlement on Dartmoor at the end of the Bronze Age' as it is clear that out of all Geographical issues covered here, climate change was the most significant. However, it is also clear as highlighted in many of the reference used here that further research into human occupation of the Moor in the late Bronze Age is needed.



**Acknowledgements:**

Dr Pete Wilson and Council Members of The Royal Archaeological Institute

Council members of The Prehistoric Society

Gillian Varndell, Curator (Neolithic), Department of Prehistory and Europe, The British Museum

Historic Environment section at Devon County Council

Jane Marchand, Senior Archaeologist, Dartmoor National Park Authority

**References:**

<sup>1</sup>Paul Pettit 1974: Prehistoric Dartmoor

<sup>2</sup>Andrew Fleming 1988: The Dartmoor Reaves: investigating Prehistoric Land Divisions

<sup>3</sup>Phil Newman 2011: The Field Archaeology of Dartmoor

<sup>4</sup>The Domesday Book Online:

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<sup>5</sup>[www.neighbourhood.statistics.gov.uk:dissemination/LeadAreaSearch.do?a=3&r=1&i=1001&m=0&s=1347486342942&enc=1&areaSearchText=Devon&areaSearchType=13&extendedList=true&searchAreas=](http://www.neighbourhood.statistics.gov.uk:dissemination/LeadAreaSearch.do?a=3&r=1&i=1001&m=0&s=1347486342942&enc=1&areaSearchText=Devon&areaSearchType=13&extendedList=true&searchAreas=)

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