DISCOVERING BRITAIN

Royal Geographical Society with IBG

Tors and tin

A self guided walk on Dartmoor in Devon

Find out how this craggy landscape of rocky tors and boggy mires evolved
Experience life in a Bronze Age village
Discover how Dartmoor was shaped by tin miners and farmers
Learn to spot the scars of the moor's mining past

www.discoveringbritain.org

the stories of our landscapes discovered through walks

Created in collaboration with

THE THIRD AGE TRUST

U3A

THE UNIVERSITY OF THE THIRD AGE

This walk is based on the winning entry in a competition to design a walk held by the U3A in collaboration with the RGS-IBG

Contents

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Cover image: Aerial vew of Grimspound © Adrian Warren

Tors and tin

Discover over 5,000 years of human activity on Dartmoor

Dartmoor is the largest upland in Southern England and it's certainly a landscape full of contrasts.

A place of wild and windswept moors, dramatic rocky outcrops and sweeping sheltered valleys.

At first glance it can appear an empty, desolate environment yet it is full of intriguing clues to the past.

This walk traces Dartmoor's evolution over time. It tells the story of how humans have lived, worked and exploited this apparent wilderness from prehistory to the present day.

Find out how geological forces under the earth created the granite rock which forms the distinctive tors.

Step into a Bronze Age settlement to see how our ancestors once lived.

See the scars left behind by generations of tin mining, learn how to spot a Dartmoor bog and relax in one of the remotest pubs in England!

Top: Scars of mining below the remote Warren House Inn © Pat Wilson
Bottom: Prehistoric hut circle at Grimspound © Alison Thomas

Safety notice

Dartmoor covers 368 square miles. Navigational aids are minimal, there are few signposts and virtually no lighting after dark. Transport links are relatively remote and mobile phone coverage is limited.

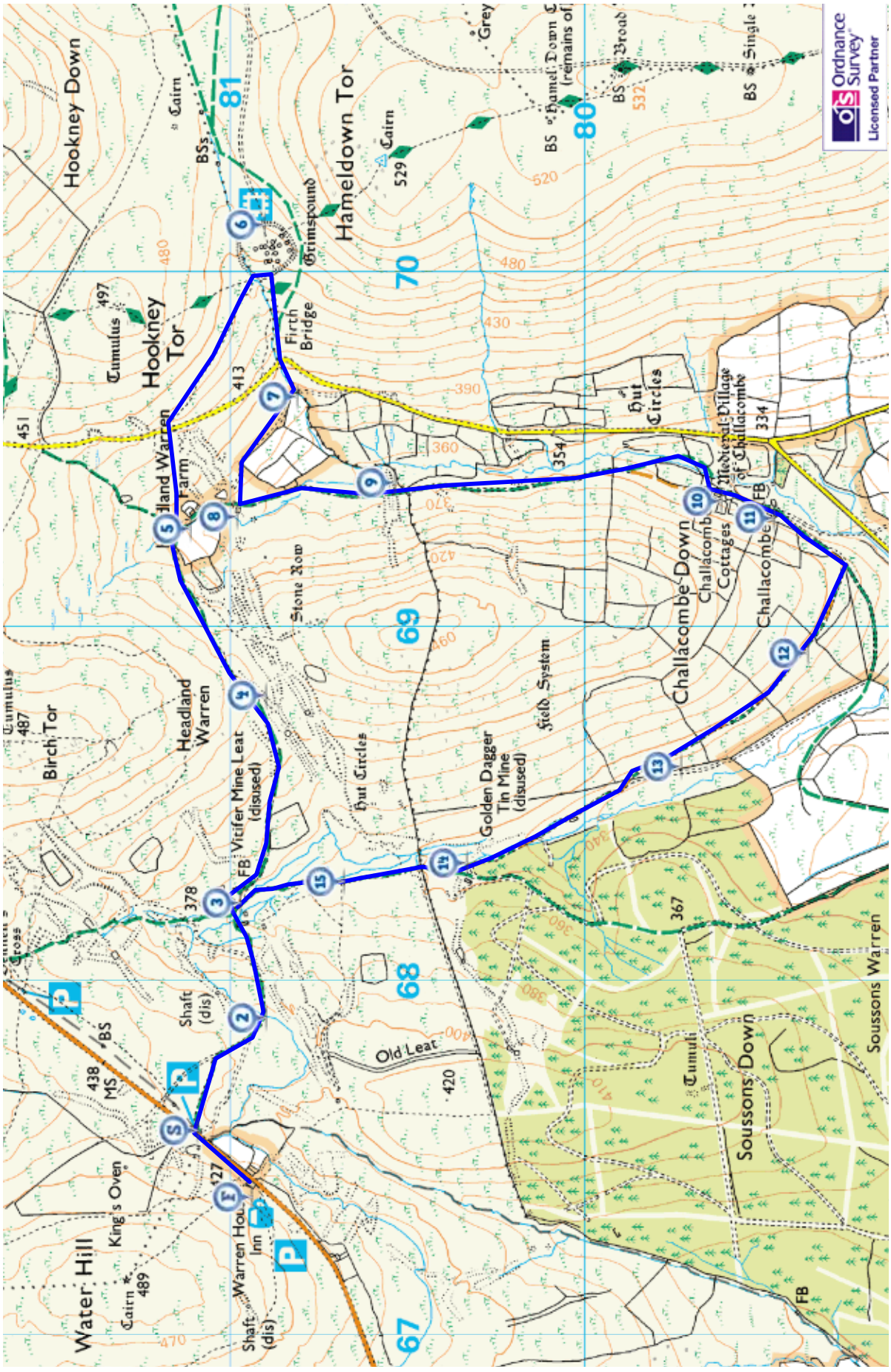
Always take a map and keep to recognised paths. Before going on to the moor, tell somebody where you are going beforehand especially if you are travelling alone.

Weather conditions can change very quickly, even in the summer. Warm waterproof clothing and strong footwear are essential.

The walk route is exposed and can be muddy underfoot. It is not recommended to try this walk in thick mist or heavy rain.

We recommend you check the weather before walking on the moor. See www.dartmoor.gov.uk/visiting

Route overview



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Stopping points

		Grid reference
Start	Roadside parking near The Warren House Inn	SX 6756 8109
2.	Track on the high moor just after Walla Brook	SX 6791 8091
3.	Stone bridge by Birch Tor and Vitifer Mine	SX 6819 8099
4.	Saddle of the hill, alongside gullies	SX 6872 8089
5.	View from signpost to Headland Warren Farm	SX 6922 8116
6.	Grimspound	SX 6998 8093
7.	Warren boundary stones	SX 6966 8081
8.	Remains of Headland Tin Mine	SX 6934 8097
9.	Rabbit-proof wall, Challacombe Down	SX 6937 8061
10.	Challacombe medieval hamlet	SX 6936 7957
11.	Millennium pond, Challacombe Farm	SX 6931 7944
12.	View to Soussons Farm and Conifer Plantation	SX 6897 7935
13.	Remains of Golden Dagger Tin Mine	SX 6862 7976
14.	Remains of Golden Dagger waterwheel and ‘dry’	SX 6830 8035
15.	Valley ponds by Redwater Brook	SX 6827 8075
Finish	The Warren House Inn	SX 6743 8094

Practical information

Location	Dartmoor, Devon
Start point	Parking area (marked P on the map) ¼ mile from The Warren House Inn on opposite side of the B3212.
Finish point	The Warren House Inn, PL20 6TA
Getting there	**Car** - On the B3212 between Moretonhampstead and Princetown. The suggested parking area is going towards Moretonhampstead. **Bus** - Bus route 82 is a hail and ride service running between the Warren House Inn and the Miniature Pony Centre. For more information tel: 0871 200 22 33 or visit www.travelines.com **Bicycle** - National Cycle Routes 2, 3, 27 and 33 pass through Dartmoor
Distance	4 ½ miles
Level	Moderate - a reasonable level of fitness is required
Terrain	Hilly with some moderately steep rough paths and muddy conditions. Walking boots and suitable clothes advisable.
Conditions	Weather conditions can change quickly on high moorland. It is not recommended to try this walk in thick mist or heavy rain. We recommend you check the weather before walking on the moor. See www.dartmoor.gov.uk/visiting

Suitable for	**Dogs** - The area is commonly used by dog walkers but be aware that cattle, sheep and ponies wander freely. Not suitable for pushchairs or wheelchairs.
Refreshments	The Warren House Inn (Start / Finish). The Millennium pond by Challacombe Farm (Stop 11) is ideal for picnics.
Toilets	Toilets available at The Warren House Inn for customers. Nearest public toilets at Dartmoor National Park Visitor Centre, Postbridge, PL20 6TH
Places to visit	**Castle Drogo**, Drewsteignton, near Exeter EX6 6PB www.nationaltrust.org.uk/castle-drogo **Becky Falls** near Bovey Tracey www.beckyfalls.com **Miniature Pony Centre,** Moretonhampstead Q13 8RG www.miniatureponycentre.com **East Dartmoor Woods & Heaths National Nature Reserve** www.naturalengland.org.uk/ourwork/conservation/designations/nnr/1007127 **Dartmoor Prison Museum**, HMP Dartmoor, Princetown PL20 6RR www.dartmoor-prison.co.uk
Visitor information	**Dartmoor Information Centre**, Moretonhampstead www.moretonhampstead.com **National Park Visitors Centre**, Postbridge www.dartmoor-npa.gov.uk/visiting

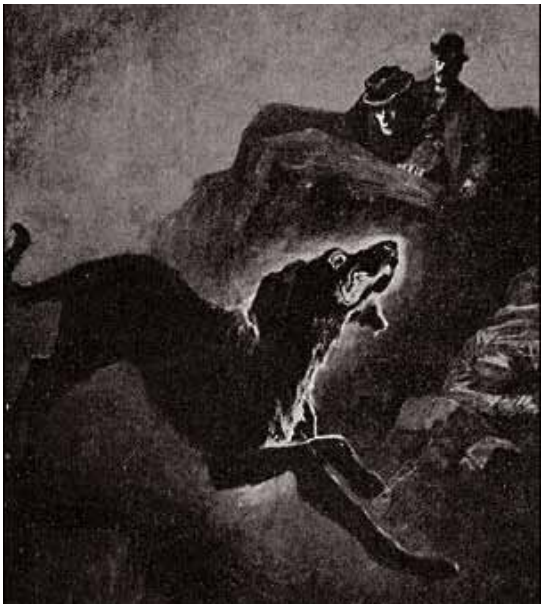
1. Welcome to Dartmoor

Roadside parking near The Warren House Inn

When the sun shines on Dartmoor it glows, picking out the rocky hills called tors. When the clouds descend, the wind lashes and the rain is nearly horizontal, it can be one of the bleakest places imaginable.

Its sparsely inhabited landscapes, almost entirely cleared of their natural forests, are linked with tales of ghosts and witches. Its legends inspired the creator of Sherlock Holmes, Sir Arthur Conan Doyle, to write The Hound of the Baskervilles. Close to its centre lies one of Britain's most isolated prisons, rising starkly from the moors and built of the hard local stone, granite.

Heather and gorse give the moor its distinctive palette
© Alison Thomas



The Hound of the Baskervilles
Wikimedia Commons (CCL)

Dartmoor can appear an empty, desolate environment yet it is full of intriguing clues to our past. This walk explores both the physical and human evolution of the moor over time.

It was suggested by Alison Thomas who has lived on the edge of Dartmoor for thirty years. During this time she has enjoyed walking, cycling and exploring Dartmoor in all weathers and grown to love the wild rawness of the landscape.

Working with Pat Wilson, physical geographer and Honorary Fellow of the Royal Geographical Society, they developed this walk to introduce you to and help you understand Dartmoor's atmospheric beauty.

Directions 1
Leave the car park by the wooden post in the far corner (with a public bridleway arrow on it). Head away from the road and follow the bridleway for about 100 metres, then stop to appreciate a 360-degree panoramic view of the landscape.

2. 280 million years ago...

Path on the high moor just after Walla Brook

We're now standing at 400 metres above sea level and all around are the highest areas of Dartmoor. Hopefully the view is good! If it isn't then you're experiencing typical moorland weather. This upland landscape is very often wet and windswept.

Look at the map to locate the distinctive rugged crags of Birch Tor visible on the skyline. On a good day, you might also be able to pick out Hookney Tor on the eastern horizon. Between the areas of higher ground notice the gentle, open valleys grown with heather, scrub and stunted trees. Tiny streams like the Walla Brook we have just crossed are another typical feature of this moorland landscape.

Birch Tor - one of many granite tors on Dartmoor
Herbythyme, Wikimedia Commons (CCL)

So how did this unusual landscape of undulating valleys and craggy tors originate? It's a surprising story so let's try and understand it. Where the moor now stands was once a great mountain chain created by huge tectonic movements in the Earth some 280 million years ago. At the same time, deep within, molten magma was forcing its way into the cores of these mountains. It solidified as granite several miles below the surface.

Now fast-forward tens of millions of years. The mountains have been eroded away by the elements, leaving the core of granite exposed at the surface to create Dartmoor and the other granite moors of southwest England.

The tors are like pimples left exposed on the very highest areas of Dartmoor. Made of the same granite, they are simply the tougher areas of rock that are more resistant to being weathered and eroded. They remain today as upstanding rocky masses, often silhouetted against the skyline.

Directions 2
Follow the wide track until halfway down the valley side. When it divides, go down the two stone steps on the right hand path. Carry on down to the valley floor passing a tall post on the right. Just after the post you'll cross a distinctive leat (water channel). Walk across the flat grassy area and stop on the stone bridge, marked FB for 'footbridge' on the map.

3. Industrial scars

Stone bridge by Birch Tor and Vitifer Mine

The bridge you're standing on is a good example of a traditional Devon clapper bridge made from granite slabs taken from the surrounding landscape.

Take a look around. The bumpy landscape and jumbles of stone around you are all that's left of Dartmoor's most significant industry – tin mining.

This area was part of the Birch Tor and Vitifer Mine which covered an area of four square miles, making it the most extensive surface mining operation on Dartmoor.

Remains of Vitifer Mine buildings with Birch Tor on the horizon
© Alison Thomas

Tin was mined here for about 800 years from the medieval period up to the twentieth century. The area is still scarred by its waste heaps, gullies and stone ruins. Stopping in this quiet, tranquil spot it is difficult to imagine this area was once a hive of industry employing over a hundred people, including women and children.

Left: remains of mine buildings © Derek Harper, Geograph (CCL)
Right: women workers smashing up tin ore with hammers
from the Proceedings of the Institution of Civil Engineers (1858), Wikimedia Commons (CCL)

From this vantage point on the bridge you can get an idea of the extent of the mine's workings. Standing with your back to the hill, behind you was the blacksmiths' forge and the miners' 'dry' where the miners changed out of their wet clothes. Beside you on your right was the carpentry workshop, while in front are the remains of a dormitory, forge, gardens, a bungalow for miners' families and the mine captain's office.

Unfortunately during the Second World War, unexploded bombs were brought here from Plymouth to detonate them safely, and many of the mining remains were badly damaged in the process.

On the hillside are several small walled enclosures. Miners used them for growing vegetables but originally they were used for growing a food called furze for rabbits. We will find out more about the significance of these rabbits when we go over the hill.

Granite obtained from quarries like Hay Tor was used as a local building material

Directions 3
Cross the bridge and walk 15 metres to a wide track. Turn right and walk for a further 25 metres. Take the track to the left uphill until you meet a wall on the right. Follow it, then continue upwards when it veers off to the right passing nearer to Birch Tor on the left. Continue walking until the path flattens out then stop at the top of the saddle.

4. Working it out

Saddle of the hill, alongside gullies

We have just seen the remains of an important tin mine but what is tin and where does it come from? Back to our geology lesson...

When the magma cooled deep below the Earth's crust, warm fluids circulated between the joints within the granite. These fluids contained a mix of all the chemicals necessary to produce various minerals including tin.

A typical mineral vein from the Birch Tor and Vitifer Mine might include tin ore and iron ore. They all grew together intertwined with the mineral quartz. These minerals crystallised at different temperatures forming veins or lodes within the cooling granite.

These lodes were then worked out by the miners in a variety of ways. For centuries water flowing from rivers and streams naturally eroded lodes found close to the surface and carried the minerals downstream.

Woodcut of 'streaming'

From at least the eleventh century these alluvial ores were dug out by hand in a system known as 'streaming'. Nearly every river on the moor shows signs of this type of extraction which was similar to gold panning. Later in the walk we will see evidence of this early process.

Today these gullies are a striking feature of the moor

The ridges that we can see here to the right of the path are spoil heaps. They're evidence of a later stage of mineral extraction.

When the stream works ran out, the miners turned their attention to digging out the mineral lodes at the surface. These lodes ran parallel across the hillsides often in a north-east/south-west direction.

In digging them out the miners created enormously deep gulleys known as 'gerts' just like the one you are looking into on your right.

Deep 'gerts' still score the landscape, creating dry gulches in summer and deep streams after wet weather
© Alison Thomas

Unlike streaming which used the naturally occurring rivers and streams to wash out the tin, water was brought in by artificial channels known as leats. The water was then used to separate out the heavier tin ore from the gangue (the waste material). This type of mining was known as openworks.

The tin miners were not the only people who left their mark here on the landscape. On the side of Challacombe Down opposite, you should be able to pick out a triple row of stones going up the hillside. They are easier to identify in winter without the bracken.

No one knows the origins of these stones but they date from prehistoric times. Many of them have a burial mound at the end of a row so they may have had a religious function.

Challacombe Down stone rows
Guy Wareham, Geograph (CCL)

Directions 4
Go straight across a meeting of tracks and head downhill towards the remote farmhouse of Headland Warren with Hookney Tor ahead of you on the skyline. Stop at the signpost beside the track by Headland Warren Farm.

5. Run rabbit run

View from signpost to Headland Warren Farm

The group of buildings tucked into the hillside amongst the trees is Headland Warren Farm. You can see it was deliberately built on the lower valley side in order to avoid the worst of the moorland weather.

Even today in the twenty-first century the house is very isolated and has no mains facilities. Electricity comes from a generator, bottled gas is used for cooking, and water is pumped from the local stream. But why was a farmhouse built in this remote, inhospitable spot in the first place?

The isolated Headland Warren Farm
© Alison Thomas

Documents dating back to the eighteenth century tell us that the land was used as a rabbit farm. Before the Victorians turned them into domestic pets, rabbits were bred both for their meat and fur, which was used to decorate ladies' garments such as nightgowns and gloves.

Rabbit farming was a major economic activity on Dartmoor
© Rory Walsh

This rabbit farm (or warren) stretched from near our first stop in the high moor right across the area below Birch Tor into this valley. It was over 600 hundred acres. The rabbits were kept in the warren by natural features and special rabbit-proof fences, which we will see later. They bred during the summer and were killed for their meat during the winter months. When the mines were at their peak, this farm opened as the Birch Tor Inn and sold beer and rabbit meat to the hungry and thirsty miners.

Directions 5
Follow the sign to the bridle path. Where the track forks, take the right fork up to the road. Go straight across the road and follow the small track that winds round the hillside with the tor on the skyline, keeping the road on your right. Follow the track to reach a low stone wall. Keeping the wall on your left, follow it round until you reach an opening. Walk through it and continue towards the centre where you will see a very well-preserved hut circle on your right.

6. Bronze Age living

Grimspound

This area known as Grimspound is one of the most famous and well-preserved Bronze Age sites in Britain. According to English Heritage, it dates back almost 3,000 years to around 700 to 450BC.

This low stone wall encloses the remains of twenty four hut circles which offered shelter and protection to our Bronze Age ancestors.

Incredibly these houses have survived for almost three millennia thanks to the tough local stone they were built from - granite.

Each house was built with a stone circular wall. They probably had a low conical, wigwam shaped roof, thatched with brush or heather.

An aerial vew of Grimspound
© Adrian Warren

One of Grimspound's twenty four hut circles
© Pat Wilson

Evidence of porches, paved floors, hearths, raised benches and cooking holes have been found in some of the hut circles.

The people who lived here grew cereals and kept cattle and sheep on the open countryside around the village, bringing their stock into the walled enclosure at night to protect them.

We're high up here, at 450 metres (or 1,500 feet) above sea level which suggests that our Bronze Age ancestors probably built their settlement here for defensive reasons.

The people who lived here would have also needed a water source. See if you can spot the small stream that runs through Grimspound which would have provided an excellent water supply for cooking, drinking and washing.

Feel free to walk around, investigate some of the huts and soak up the atmosphere of this evocative place before continuing the walk.

Top left: view of Grimspound built into the side of the moor
Bottom left: remains of a hut circle built by Bronze Age settlers
Right: a natural stream that kept the site supplied with water

Directions 6
Leave by the same exit. Follow the path downwards then descend by a granite slab walkway and track. At the road turn left and walk a few metres to where it goes over a small moorland stream. Just before the stream turn right and follow a narrow path down towards the lower road, which leads to Headland Warren Farm. Just before you reach this access road, on your right you will see a tall granite post about 10 metres away at the top of a short slope. Climb up through the bracken to reach it.

7. Bogs and burrows

Warren boundary stones

Wide, open valleys like this one around you are very common on the moor and this is where you'll find the infamous Dartmoor bogs.

The bogs were formed during the last Ice Age about 20,000 years ago, when very cold sub-Arctic conditions kept the ground frozen for most of the year. For a short time in summer the top layers melted and any loosened material on them sludged downhill. Over time this sludge smoothed out the land surface and the material collecting on the valley floors created deep boggy conditions.

Now look around and see if you can see a granite post carved with the letters 'WB'. These posts marked a small section of the boundary of the rabbit farm. They are easier to see if there is no bracken.

Granite stones were used to mark land boundaries
© Alison Thomas

So why was this area in particular chosen for rabbit farming? We need to look to past industry again for the answer. Soft, loose ground left behind by the medieval miners digging in the valley floor, provided plenty of easy burrowing for the rabbits. The locally-occurring granite stone also meant that stone walls and traps could be built easily.

The warren was still in use until well into the twentieth century when the myxomatosis epidemic killed 95 per cent of Britain's rabbit population. The farm then had to look for an alternative means of making a living and diversified into self-catering and stabling for visiting tourists horses.

While you're here, look over to the side of Challacombe Down on the western slopes of the valley. The horizontal ridges you can see on the hillside are known as 'lynchets' and they were formed by medieval ploughing. We will find out more about these in more detail when we get closer.

Directions 7

Descend from the boundary stone to the small road. Turn right and follow it down to the Headland Warren Farm. After the cattle grid, turn left and pass by some ramshackle farm buildings. Go through a large metal farm gate with a faded wooden sign 'bridle path to Challacombe Farm'. Go through a second metal farm gate to reach an ancient track that heads south around Challacombe Down. Stop just after you pass through the gates.

8. Going underground

Remains of Headland Tin Mine

The area we're standing in now was once the Headland Mine - another of Dartmoor's tin mines. If we look closely, we can still see the scars this industry left behind on the landscape.

Around us are examples of the three main methods for extracting tin used over the centuries. First, look around to spot lumpy areas of earth. Now grown over with grass and subsumed as part of the 'natural' landscape, these mounds were once spoil tips. They were created from waste left behind by early miners looking for tin in the bed of the West Webburn river.

A buddle at work
From the collection of David Johnson
www.miningartifacts.org

Mining gullies or 'gerts' visible beyond Grimspound
© Pat Wilson

Now look up the hillside on your right and you should see the remains of several long gullies known as 'gerts'. When the easily accessible tin washed from the rivers finally ran out, miners began actively following the veins of minerals (or lodes) in the earth by digging down into the hillside.

Depending on the weather conditions these gerts might be dry or gushing with water.

With the Industrial Revolution the demand for metals grew. Industrialisation also provided the technology that enabled miners to dig further underground to extract the tin. From the eighteenth century onwards horizontal tunnels known as 'adits' were dug into the hillsides to reach the lodes underground. As the miners went deeper they met with water which then needed to be pumped out. Waterwheels were then built to power the drainage pumps. We'll see evidence of one of these later on the walk.

If you climb up on some of the old mine ruins by the footpath you can clearly see the spoil tip at the end of the gully leading to the adit entrance on the hillside.

Directions 8
Continue along the track until you reach the big wall. Stop beside the wall.

9. Bunny boundary

Rabbit-proof wall, Challacombe Down

Beside you is the rabbit-proof wall that we first saw at the track leading to Headland Warren Farm. It continues right over the top of Challacombe Down - we will see it again on the other side!

The wall was built to keep the rabbits within the marked area, and to keep vermin out. If you walk alongside the wall, you might be able to spot two holes in the base. These are vermin traps. Two slabs of granite formed a narrow tunnel. At each end there were two slate shutters which triggered after the animal entered, leaving them caught in the middle.

A section of the rabbit-proof wall over Challacombe Down
© Alison Thomas

Strip lynchets on the hillside
© Alison Thomas

These were designed to provide protection from stoats and weasels, the rabbit's main predators. They are well preserved but the slate shutters have gone.

From this point you can clearly see a series of steps or ridges cut into the hillside. These are known as strip lynchets and were created by medieval farmers. In a similar way to modern terraces (think for instance of stepped paddy fields in southeast Asia) this system of farming maximised the ground available for crops in upland areas. This was a time when a high rural population created pressure for more agricultural land.

Contrast this intensive use of hilly land with the other side of the valley where you can see more typical field systems. The smaller fields nearest the settlement called 'infields' traditionally grew labour-intensive arable crops such as wheat, barley and vegetables. The fields further from the village near to open moorland were 'outfields' used for cattle pasture.

Directions 9
Continue along the path through two gates (one of which has a wooden sign 'Challacombe Medieval Hamlet'). Pass some small Victorian cottages on the right. Stop at the notice board in front of the best-preserved of the stone houses.

10. Unusual housemates

Challacombe medieval hamlet

These stone buildings are the remains of the medieval hamlet of Challacombe. Here it is possible to make out the ruins of at least seven traditional Dartmoor longhouses.

Longhouses were designed so that people lived in the same building as their animals. An internal wall divided the people on one side from the animals in the other half.

There were several advantages to living with your livestock. Cattle gave off an important source of warmth, vital in this exposed landscape. Keeping cattle close also saved farmers from excursions out onto the moor in bad weather to check on them.

Remains of a longhouse at Challacombe
© Alison Thomas

Take a closer look at the best-preserved of the longhouses. See if you can spot the opening for a window two-thirds of the way up the wall and a hole at the bottom for the drain. The livestock quarters were deliberately built down the slope so that their waste drained away from the humans' living area.

A Dartmoor longhouse with animal quarters to the right
Derek Harper, Geograph (CCL)

Evidence of human settlement in this area dates back to the eleventh century when Challacombe Manor was mentioned in the Domesday Book of 1086. Over four hundred years later Foresters accounts of 1505 record a 'vill' (small hamlet) at 'Chalvecombe'.

The people who lived in these lands were considered special tenants of the king and had 'venville' rights. This allowed them to graze cattle on the moor from sunrise to sunset. They could also gather stone and cut peat.

In return they paid a rent and helped with the 'drift' - collecting ponies and cattle off the moor.

At one stage in its history, one of these buildings was turned into a cider house to serve thirsty miners from the nearby tin mines. Most of the local men probably combined farming with mining to make a living from the land.

As you walk around, notice the use of the local granite in the walls, window frames, gateposts and troughs.

Some of the granite artefacts from Challacombe hamlet, including a gatepost (right)
© Alison Thomes

Directions 10
Continue a short way along the track passing the present Challacombe Farmhouse on your right. Stop at the Millennium seat and pond – an ideal place for a picnic!

11. Farming for the future

Millennium pond, Challacombe Farm

Challacombe Farm is a modern hill farm situated on land that has been worked continuously for around 4,000 years using traditional methods. This farm, like many others on Dartmoor and in the Southwest, is owned by the Duchy of Cornwall and is leased to the current tenants.

One of Dartmoor's hardy sheep
© Alison Thomas

Today it is a cattle and sheep farm. The cattle are all descended from just ten cows who were brought to the farm in the early 1970s and are adapted to the harsh conditions of Dartmoor. Despite being a hardy breed, during the hard winter months they are still kept in the barns that you can see behind the farmhouse.

The sheep are a tough breed too. They're a mixture of Black Welsh Mountain and Cheviots. There is also a small collection of pedigree Dartmoor ponies who run wild on the moor, but are all owned and cared for by the farmer.

Granite trough possibly used to mould tin ingots
© Alison Thomas

Today the farm is deliberately managed to conserve its archaeology and wildlife whilst maintaining its economic viability. In 2006 the Duchy awarded it a Silver certificate in recognition of the work accomplished here. The ponds were created as part of the farm's environmental work and attract some unusual species. They include the extremely rare bog hoverfly, which was thought to be extinct and is only found on Dartmoor.

Before leaving the farm, look out for a granite trough at the end of the pond. The gouged-out hole may have been used as a mouldstone for casting tin ingots.

Directions 11
From the seat, turn back and follow the track up behind. Go through the right hand farm gate signed Bennetts Cross. Follow the track as it contours round the side of Challacombe Down. Stop at the bridle path sign on the post overlooking a farm and conifer plantation on the left of the track.

12. Managing the moor

View of Soussons Farm and Conifer Plantation

From here we can look over towards Soussons Farm and Conifer Plantation. As with the entire walk, this farm lies within the boundaries of the Dartmoor National Park. One of the purposes of the park authority is to ensure that the moor's natural beauty, wildlife and cultural heritage are conserved.

View to Soussons Farm and Conifer Plantation
© Alison Thomas

Soussons Farm, which was also once a rabbit farm, must maintain a farming ethos true to these terms. Today it is another example of a modern Dartmoor hill farm, where cattle and sheep are the main sources of income.

Grazing farm animals are very important in preventing the moor being overrun by scrub and in maintaining suitable conditions for a wide range of moorland species including buzzards, bats and butterflies.

This modern land management policy contrasts markedly with the development of the conifer plantation you can see next to the farm. It was planted just after the war in 1946 when the government needed large supplies of wood.

Unfortunately it was insufficiently surveyed before planting began. Many archaeological remains are thought to have been destroyed when the area was ploughed. However the Ringaston ring cairn, an impressive circle of 22 standing stones, survives within the forest.

On this side of the Redwater Valley you can see further evidence of how early inhabitants marked out the landscape. Around you are long low mounds of pointed stones descending in lines down the hillside. These are called 'reaves' and they were built by prehistoric people to mark their field boundaries. Look out for them as you carry on along this track.

Directions 12
Carry on down the hill passing more prehistoric reaves and medieval terraced lynchets. Go through the gate, and almost immediately you will start to see the stone remains of the Golden Dagger Tin mine.

13. The final cut

Remains of Golden Dagger Tin Mine

We are now walking through the site of what was once the Golden Dagger tin mine. This was the last working mine on Dartmoor, thought to have been named after an ancient bronze dagger that was found here.

Pass through the gate and you will come across the remains of circular pits called 'buddles' on both sides of the path. These pits were designed to separate the heavier tin ore from the waste.

The iron pipe that brought water to the buddles from upstream is still visible on the slope opposite.

Soon after you pass the buddles you will reach the remains of the dressing floor on your right. The dressing floor was the area where the tin was processed before being sent off for smelting.

Women and children were employed in this dirty, smelly and often dangerous work of breaking up, crushing and separating the tin.

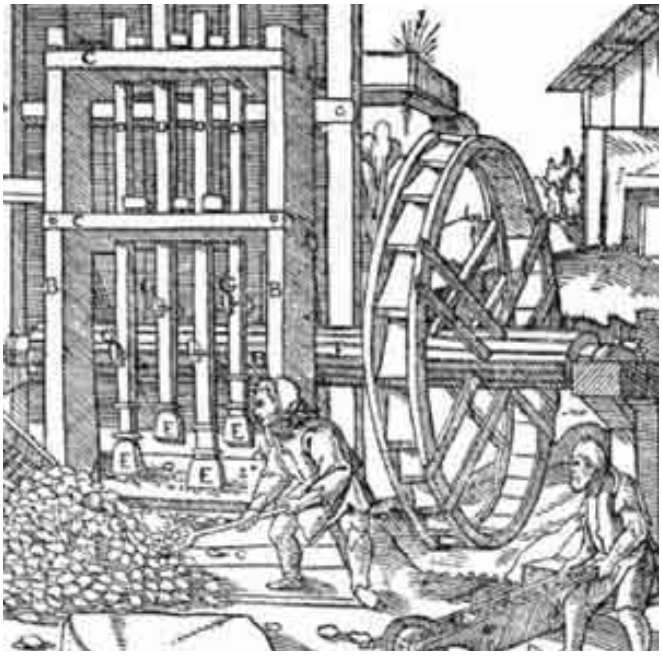
The remains of a buddle wheel
© Alison Thomas

Mine workers including women who broke up the ore
Wikimedia Commons (CCL)

Continue ahead and on your left you'll see the stone remains of Dinah's House which over the years has housed several families of miners.

Entering the ruin, on your left was the sitting room, where you are standing was the mine office and on the right there was a kitchen, two bedrooms and a storeroom you can still see below.

Left: the storeroom inside Dinah's House. Right; remains of stamping machines used to crush tin ore



Stamping machine and waterwheel

Large stamping machines in front of Dinah's House were used to crush the ore. These were heavy hammers powered by water that smashed up the minerals to expose the tin. This would once have been a noisy, dusty and dangerous place to live and work.

Next to the path on the opposite side you can just pick out the remains of a channel which runs alongside the track. This probably carried water for the water wheels which in turn powered the mine's machinery.

Directions 13
Continue along the track for a short distance until you reach the first obvious footpath on the left hand side. Follow it towards the conifer trees. Cross a small stream and then as soon as you reach the first trees look up the hillside on the right and you should see a walled and fenced enclosure. When you are below it on the path, turn right and follow a very narrow footpath about 10 metres up through the bracken and brambles to reach it. Follow the fence around to the top.

14. Wet and dry

Remains of Golden Dagger waterwheel and 'dry'

This rectangular stone hole is the remains of a well-preserved wheel pit. Try to get to the top of the enclosure. There may be a few brambles but it will be worth it to see right inside the pit.

This pit housed a particularly wide waterwheel designed to give maximum power to the stamping machines alongside it. The vertical rods which stamped the ore can still be see rusting to the right side of the pit. The waterwheel was powered by water from a leat, a man-made channel.

The miners 'dry'
© Pat Wilson

Directions 14a
Now retrace your steps back to the main track (noticing the old leat on the right). When the track divides take the left hand fork by a signpost pointing back to Challacombe and Headland Warren. Stop at a long, narrow ruined building.

This building was the miners 'dry,' where they could change their clothes after work before heading off for their long walk home. Sidney French, a Golden Dagger miner, reported that before this 'dry' was built he had to walk all the way up the valley in wet clothes to the Vitifer Mine.

Behind this ruin is the main Golden Dagger Mine. The approach to is it very boggy so it is not recommended. Dug into the hillside to the left is a huge, long gully with the adit entrance to the mine at the end. The lode here ran in an east-west direction across Soussons Down. Three shafts were made to access the underground levels. One of them is nearby and fenced off on the right.

Work finished here in 1930 but during the following decade some of the old tips and alluvial material was worked over again with small quantities of tin extracted - the last gasp of Dartmoor's famous tin industry

Directions 14b
Continue on the track which circles back to the main track and follow the sign to Bennett's Cross. Notice the fenced off mine shaft on the right. Follow the track to a gateway. At the gate look to the right to see the rabbit-proof fence coming down the other side of Challacombe Down. Continue to some small ponds on the right.

15. Boggy botany

Valley ponds by Redwater Brook

Many of the moor's valley floors feature mires or bogs and the Redwater Valley here is no exception.

Bogs form in areas where the underlying rock is so acid that vegetation cannot rot and so forms a layer of peat.

Many interesting plants have adapted to this waterlogged environment. Acid-loving plants such as sedges, cotton grass, bog bean, pale butterwort, bog mosses, and dwarf shrubby bushes of willow, birch and oak, hazel, holly and rowan all thrive here.

The regenerated Redwater Valley
© Pat Wilson

Sundew gets its nutrients by trapping insects on its sticky hairs and then digesting them. It's a tiny, slender plant with reddish leaves. Look out too for the distinctive orange yellow flowers of the bog asphodel. Boggy areas like this are also home to many dragonflies who feed off the midges.

When the last miners left, this area looked like a desert. Looking around now we can marvel at the regrowth.

Left: a sundew plant that has trapped a pair of damselflies. Right: the distinctive orange bog asphodel
Noah Elhardt / Elke Freese, Wikimedia Commons (CCL)

On the hillside is the ever-invasive bracken and gorse, but also heather. The soil derived from granite is very acidic. Heather in particular thrives in these conditions and if you are walking in late summer you will be greeted by wonderful swathes of colour. Walking in winter, however, when the bracken has died back allows for a clearer view of many of the prehistoric and historic remains.

Don't forget to watch out for the birdlife. You may be lucky enough to see rare birds such as skylarks, dunlin, golden plover, snipe, curlew and ring ouzels. It is this vast range of natural ecology, animal and birdlife as well as landscape and archaeology that adds to the attractions of the moor bringing a range of visitors to boost the area's economy.

Rare birds to look out for on the moor include (clockwise from top left) skylark, dunlin, ring ouzel and curlew
Daniel Pettersson / R Altenkamp / Andrea Trepte / Alan D Wilson, Wikimedia Commons (CCL)

Directions 15

Continue along the track until you reach the clapper bridge. From the bridge walk diagonally across the grass to the ruins at the foot of the track you came down. Follow the track up to the prominent pole you passed earlier. Go up the few steps at the end of it and turn left onto the wide path back to the car park. Turn left here and walk along the road to the Warren House Inn.

16. From tin to tourism

The Warren House Inn

The Warren House Inn stands at 1,425 feet (434 metres) above sea level. It is reputedly the third highest inn in England and also said to be one of the loneliest and most remote.

Originally built to serve the busy local tin mining community, the inn was also a focal point for workers from neighbouring mines, including The Golden Dagger, Vitifer and Birch Tor Mines. During this time it must have been a bustling place full of dusty miners and passing travellers. After the Golden Dagger Mine finally closed in 1930 the inn had to rely on passing trade. Today it is walkers, cyclists and tourists that flock here.

The Warren House Inn
Derek Harper, Geograph (CCL)

The present inn was built in 1845 replacing the original building that stood on the opposite side of the road. See if you can find the builder's slate plaque which is set into the eastern gable wall, and reads 'I Wills-Sept 18 1845'. Look out too for the sign above the front door which depicts three rabbits chasing each other. These are often referred to as the 'Tinners Rabbits' and can be seen decorating other Devon buildings.

According to folklore, the peat fire in the original pub was 'always in'. When the new inn was built, the landlord transferred some smouldering peat from the original building to the hearth in the new one. The fire in the new pub is said to have never gone out!

From tin to tourism: (left) today it's walkers not miners who enjoy these paths, (right) visitors stopping to enjoy the scenery
© Alison Thomas / John Phillips, Geograph (CCL)

The Warren House Inn marks the end of the walk. We hope you have enjoyed this excursion on Dartmoor and that the weather has been kind. Along the way we have discovered how dramatic physical processes sculpted and created Dartmoor's famous granite tors. We have seen the footprints left by humans on the landscape, in particular the legacy of tin mining and learnt to 'read' the bumps and hillocks, gullies and stone pits as evidence of a once huge industry.

We have also seen the changing habitations, farming practices and strange monuments left on the moor by humans who lived, worked and worshipped here. From the hut circles of Grimspound to the longhouses where farmers lived with their livestock, from medieval lynchets to rabbit farms, from burial stones to bogs, our walk has encompassed Dartmoor's five millennia of history.

Scenes from Dartmoor's five millennia of history (clockwise from top left):
Birch Tor, Challacombe Down triple stone row, the Millennium pond at Challacombe Farm, a Dartmoor pony

Directions 16
You might like to enjoy a traditional Devon cream tea at the inn before returning to the car park.

Further information

Dartmoor National Park Authority
www.dartmoor-npa.gov.uk

Dartmoor Preservation Association
www.dartmoorpreservation.com

The Dartmoor Trust
www.dartmoorarchive.org

Discover Dartmoor
www.dartmoor.co.uk

Legendary Dartmoor
www.legendarydartmoor.co.uk

Museum of Dartmoor Life
www.museumofdartmoorlife.org.uk

Reimagining the Dartmoor landscape
moorstories.org.uk

The Warren House Inn
www.warrenhouseinn.co.uk

Grimspound
www.english-heritage.org.uk

Dartmoor Pony Society
www.dartmoorponysociety.com

Credits

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http://www.discoveringbritain.org/walks/walks/region/wales/mynydd-epynt.html

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http://www.discoveringbritain.org/walks/region/scotland/bennachie.html

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