

Here's a quiz!

Q. What connects Beachy Head Lighthouse, the Mole at Gibraltar, Marks & Spencer in Brussels, New Scotland Yard, Calcutta docks, Tower Bridge, Congress House and The Stock Exchange?

A. You'll find granite from Bodmin Moor in all these places. And in roads and concrete. But there's still plenty left, helping to make Bodmin Moor unique. And the fantastic natural shapes of the granite tors have been protected for over a century.



This leaflet has also been printed in French, German, Dutch and Spanish. It is available in five languages on the world-wide web at:

www.southeastcornwall.co.uk & www.bodminmoor.co.uk

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Photographs

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English

400 million years in the making

BODMIN MOOR

HALFAWYTH

Peswar
cans mylvyl
bledhen yn
formyans

by John Macadam



Cornwall welcomes you
Kernow a'gas dynargh

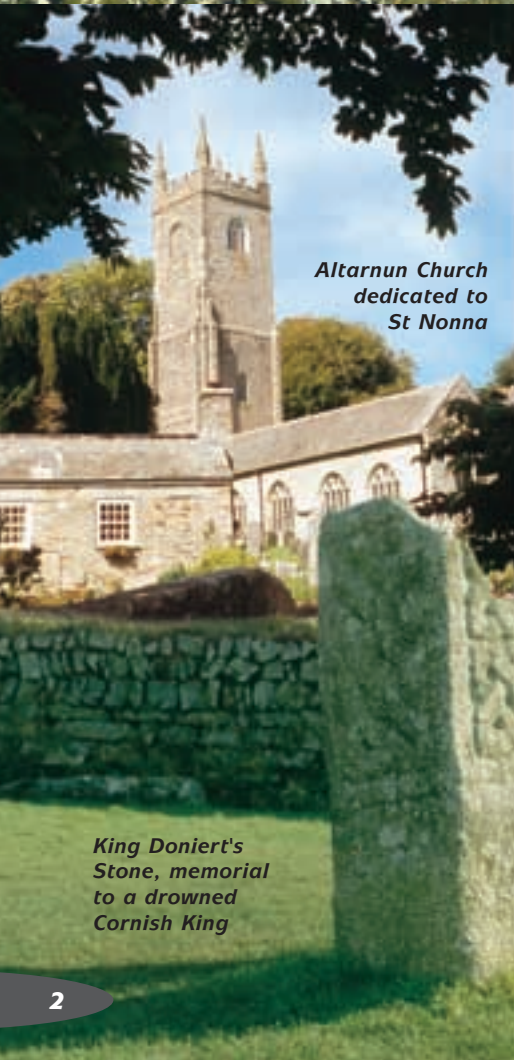
treat
with care
gwreugh hy cherysa



Stowe's Pound, a Neolithic enclosure



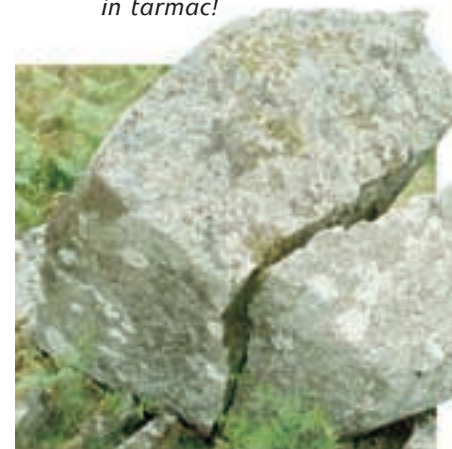
Trethevy Quoit



*Altarnun Church
dedicated to
St Nonna*

People have been using granite as a building material on Bodmin Moor since Neolithic times, that's for around 5,000 years. With a ready supply of durable stone it's not surprising that granite was used in so many ways: buildings, tombs, memorials and crosses.

Nor is it surprising that so many survive today. Initially loose rock at the surface – 'moorstone' – was used. But in the nineteenth century the quality of rock needed for civil engineering led to quarrying and an export trade which still continues today. As a result of this quarrying, millions of people have seen Bodmin Moor granite without realising it – or even visiting the moor! You might have even driven across crushed Bodmin Moor, crushed as aggregate in tarmac!



Moorstone, split and abandoned

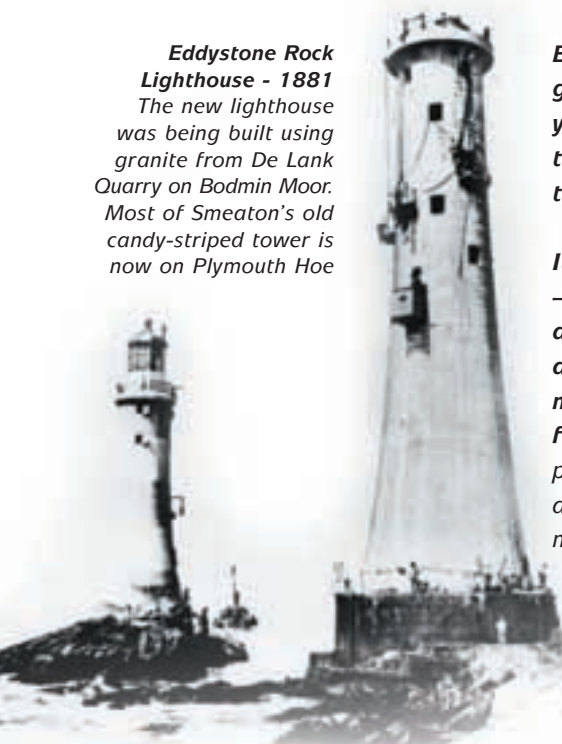


Long Tom

Grooves cut in a moorstone, ready for splitting with wedges

*King Doniert's
Stone, memorial
to a drowned
Cornish King*

Eddystone Rock Lighthouse - 1881
The new lighthouse was being built using granite from De Lank Quarry on Bodmin Moor. Most of Smeaton's old candy-striped tower is now on Plymouth Hoe



But the story of Bodmin Moor goes back far longer than 5000 years, of course. But we're talking geological, not human, timescales here.

It all begins with muddy bottoms – bottoms of tropical seas – around 400 to 350 million years ago. But then there was a slow motion shunt and mountains were formed as the Earth's tectonic plates slid slowly across the planet, destroying an ocean and creating a mountain range instead. The mud was turned into slate, and was folded and faulted.



The few fossils it contained were deformed too. Around Delabole, in the best quality slates, **shells got turned into butterflies!** Well, that's what Victorian tourists were sold!

Deep beneath the mountains **some of the Earth's crust melted and popped up towards the surface like the blobs in a gigantic lava lamp – with molten granite.** And unlike your docile, domestic lava lamp the granite blobs were very hot, at around 800°C, and some probably even exploded at the surface, in volcanoes. But most of **the granite solidified a couple of kilometres below the surface, around 290 million years ago, baking the surrounding slaty rocks.**



'Delabole Butterfly', originally a shellfish not an insect!

Baked rock with spots of new minerals

Baked slate with needle-like crystals



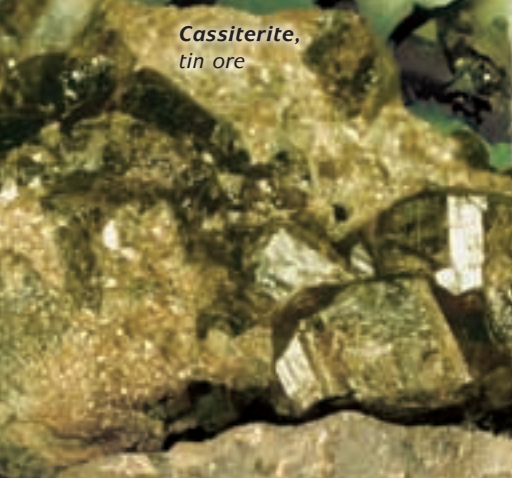
Bodmin Moor granite has been used for farmhouses, terraces, churches, crosses, roundhouses, lighthouses, harbour walls, docks, kerb stones, setts, roads, stone drains and bridges.

Including Bombay docks, Beachy Head Lighthouse, The British Museum, Congress House, Copenhagen docks, Devonport dockyard, Eddystone Lighthouse, The Embankment, Liverpool docks, London Bridge, the store formerly known as Marks & Spencer in Brussels, Milton Keynes, New Scotland Yard, Newcastle-upon-Tyne Civic Centre, Portland breakwater, The Royal Academy courtyard in Piccadilly, Southampton docks, Singapore docks, The Stock Exchange, The Tate Gallery, The Mole at Gibraltar, Tower Bridge, Westminster Bridge, Waterloo Station, and Woolworth's in Oxford Street.

De Lank Granite




Chalcopyrite,
copper ore
& Quartz



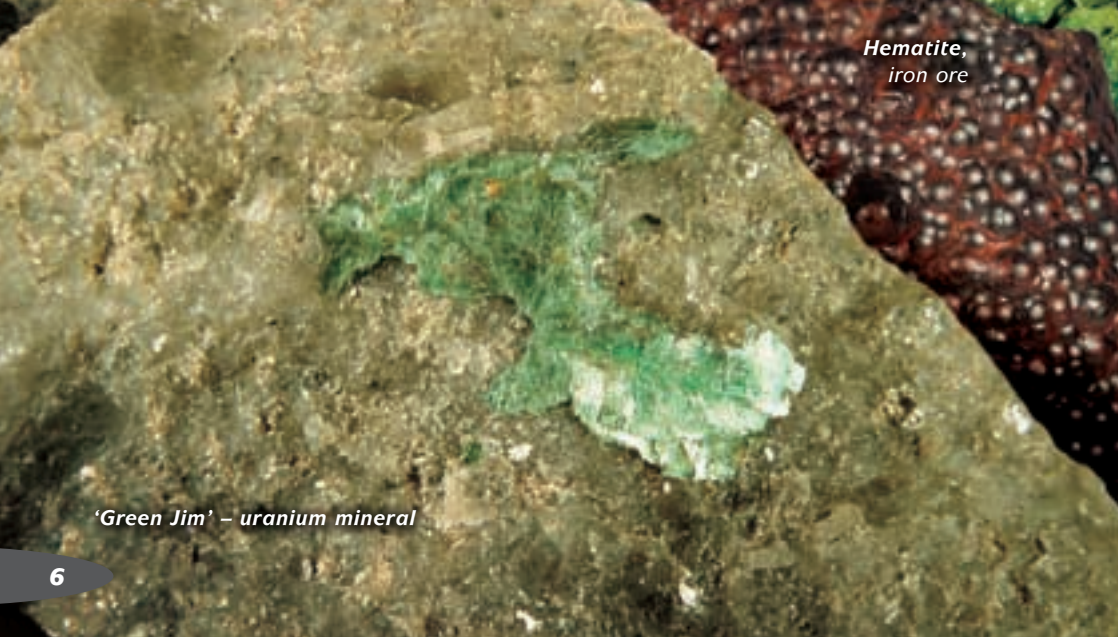
Cassiterite,
tin ore



Manganese
ore



Hematite,
iron ore



'Green Jim' – uranium mineral


As the granite cooled it shrank and cracked. Hot water circulated through the slate, dissolving metals then depositing them as minerals in veins as it cooled.

But the granite also contains tiny amounts of uranium and as this slowly decays it produces heat which has helped to keep the circulation going: a **nuclear-powered hot water tank gently circulating water!** Hot water has also rotted feldspar in the granite to form china clay.




Showery Tor

After the granite intruded, much of Britain – probably including Cornwall - became **a desert**. **But nothing stays the same for long geologically.** Britain continued to drift slowly north, sea levels rose and fell. At one stage **the sea probably covered the whole of the south-west granite moors.** But as sea level fell it paused at times, so the sea had time to erode broad flat benches in the landscape – ancient sea beds! Davidstow airfield is probably on one at around 300m above present day sea level. **You can stand on Roughtor today – at 400m - and imagine the scenery changing as the sea level fell** (but it's also best to imagine the process speeded up or you'll be there a very long time!)



Logan Rock, a rocking stone
on Little Roughtor



Roughtor



Male Wheatear

BODMIN MOOR HALFAWYTH

Hal is moor in Cornish while Fawyth ('Beech Trees') is Fowey. Bodmin Moor was Foweymoor for hundreds of years, until the Ordnance Survey renamed it on their first maps!

Map Key

- National Cycle Route
- Tourist Information
- Car Park
- Toilets
- Pubs & Inns
- Church
- Watersports
- Post Office
- Historic site
- Museum
- Railway Station



Meadow Pipit



Bell Heather



Stowe's Hill

Phoenix Mine



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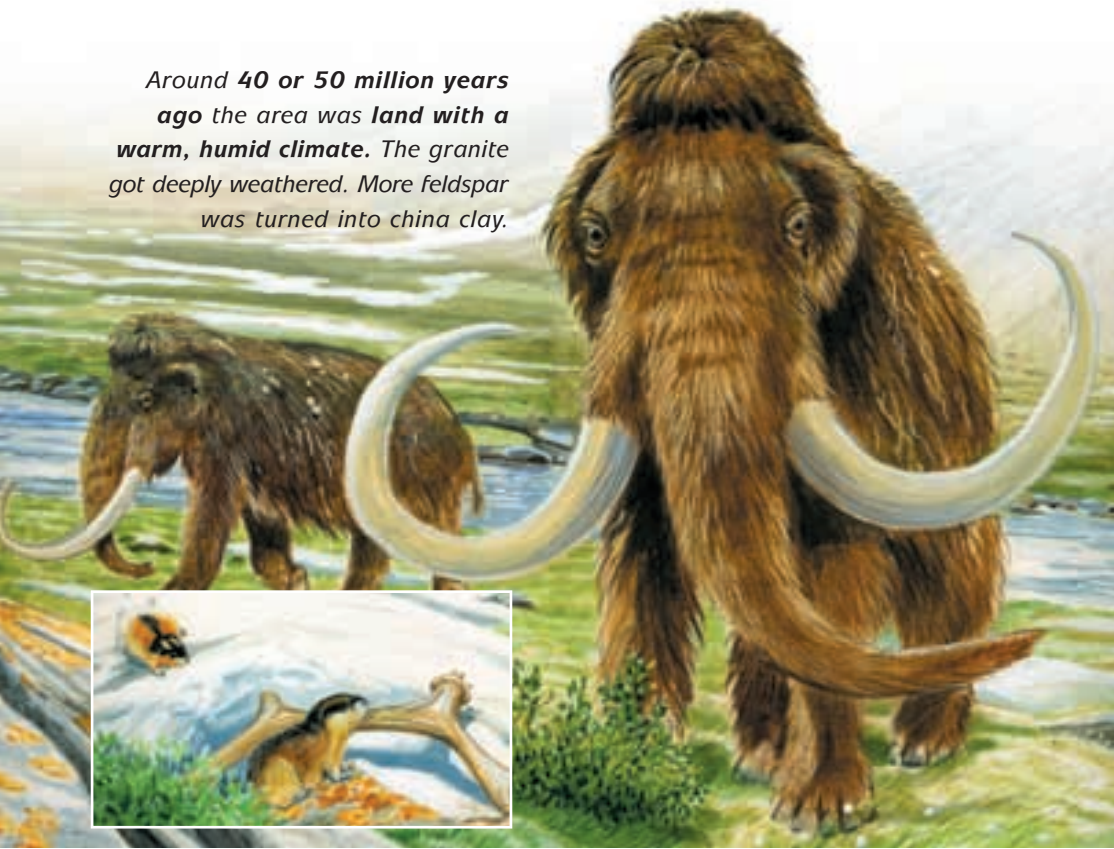


Snipe

Heath Spotted Orchid

Cotton Grass

Around **40 or 50 million years ago** the area was **land with a warm, humid climate**. The granite got deeply weathered. More feldspar was turned into china clay.



But for the last **2 million years** northern Europe has had a series of **Ice Ages**, with warmer periods between. In the colder times **Bodmin Moor** would have been **tundra**, with the ground frozen to a great depth. On this lived animals such as **woolly mammoths, reindeer – and lemmings (the original Beasts of Bodmin Moor?)**.

Though their bones have not been preserved on the Moor itself, bones have been found in caves near Plymouth. Evidence for the changing plantlife, and the climate, comes from peat deposits.

During summer thaws in the Ice Ages, the sun melted the surface and the thick weathered layer got stripped away, exposing the hard bedrock as **tors**. Large boulders slid down the hills, forming the characteristic landscape of boulder-strewn slopes – a real 'fossil' landscape.

In the valleys the heavy tinstone got left behind as streams carried away sand and mud.

sand and gravel from Bodmin Moor Alluvials at Trewint

'growan' in Cornish



Today we are living in an 'interglacial' – a warmer period. 18,000 people live in the Moor's 18 parishes, mostly on the lower ground around the edges.

Cattle, sheep and ponies graze the Moor, and it is also important for wildlife. Many areas are nationally important and are designated as Sites of Special Scientific Interest (SSSI). Some of the wetter areas are even of international significance, with rare plants and insects, such as the Marsh Fritillary – a genuine butterfly!

Granite is made of interlocking crystals of feldspar (the white bits), quartz (the grey bits) and mica (shiny grey, brown or black flakes) with no holes between them (unlike a sandstone). This means it won't let water through – apart from through cracks - so **some of the valleys are important as man-made reservoirs, storing the winter rains for use in summer by all the people in Cornwall.**



Golden Plover
& feather



Gorse & Heather



Adder

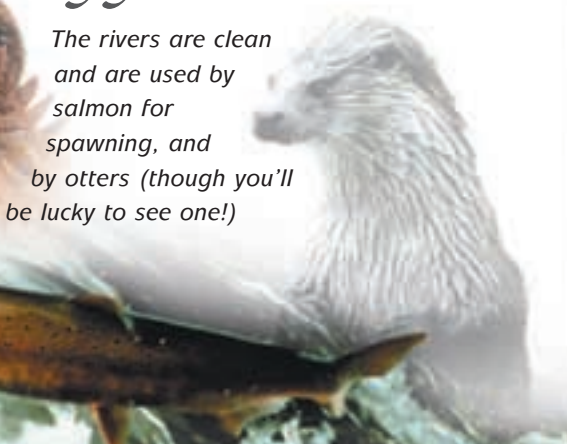


Male Stonechat

In between the valleys the higher ground has characteristic wildlife too. In winter several thousand golden plovers arrive and in summer stonechats, wheatears and skylarks are unmissable, though, fortunately, their nests are easily missed.

'love is out of fashion when gorse is out of flower'

The rivers are clean and are used by salmon for spawning, and by otters (though you'll be lucky to see one!)



At the edge of the granite the land falls away, down to the slate. The rivers fall away too – visit Golitha Falls National Nature Reserve for a little geology, dippers, bluebells in springtime, extravagant ferns, lichens and mosses. And maybe a picnic?

And every time you put on the brakes or change gear, between Minions (at 300m, on granite) and Upton Cross (at 175m, on slate) remember that **it's a geological event around 290 million years ago, and 290 million years of geological processes, that made the steep hill. Other geological processes produced the wealth of copper and tin in the area.** Tin had been worked for hundreds, maybe thousands, of years from the sands and gravels in the valley bottoms. A little gold was found too.

Cuprite



Woodwardite



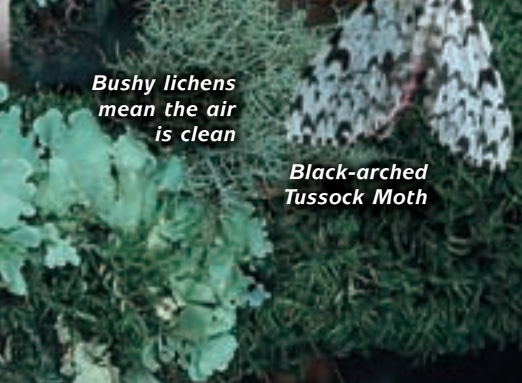
Dipper

Tunbridge Filmy Fern



Bronze Age
Rillaton
Gold Cup

Bushy lichens
mean the air
is clean



Black-arched
Tussock Moth



Nowadays old workings, spoil dumps and engine houses are everywhere, though the miners are long gone, to dig up the Americas, Africa and Australia, and leave Cornish engine houses in alien landscapes. But in Cornwall much of the harsh edges of the industrial dereliction has been softened by vegetation, some of which is of international significance. Examples are mosses and liverworts which even manage to grow on the metal-rich dumps!

But in the 1830s and 40s there was a copper mining boom, miners swarmed in from other parts of Cornwall, and villages – and shanties – sprang up.

Share prices rocketed: shares in East Caradon copper mine went rapidly from 1s 6d (7½p) to £64, with good dividends as well (some share offerings were just scams – so no change there!).

South Caradon Mine, before its closure in 1885



Bryum pallescens

Scopelophila cataracte



Can you spot The Hurlers stone circles?



Heritage Centre



Gold Diggings Quarry



Clayworkers, 1910

The area around Minions will be part of the bid for World Heritage Site status for Cornish mining. One engine house is now the Minions Heritage Centre, and inside you can find out about far earlier mining, the local archaeology (The Hurlers stone circles are close by), china clay working and quarrying. Granite was not only quarried for buildings and engineering work. Some has been crushed as aggregate, for roads and for concrete.



hot rolled asphalt
dense bitumen macadam
hot rolled asphalt
dense bitumen macadam
concrete
Core from a resurfaced road (A39)



Also near the visitor centre is The Cheesewring, a seemingly precarious pile of rocks, precariously close to the edge of the Cheesewring Quarry.

The Cheesewring has been attracting tourists – and comments – for centuries,

“.. a heape of stones, admirably depending, wherein nature hath done more at aduention (if a man may so speake) then arte or force can doe by greateste deliberation”

.....1584

“The Cheese-rings were probably constructed by nature herself, in one of her whimsical moments”

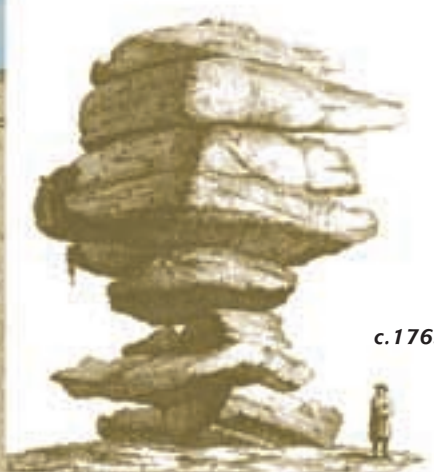
.....1797

“this wonderful pile of stones .. but whether the work of nature or not I know not”

.....1800

“if a man dreamt of a great pile of stones in a nightmare, he would dream of such a pile as the Cheesewring ...”

.....1850



c.1769

so there was an outcry when it seemed that the encroaching quarry would swallow it up. As a result the land-owners, the Duchy of Cornwall, set strict limits in the legal documents, and these limits were shown on the ground by fleur-de-lys, and other marks, cut into the granite and painted white. This is probably the earliest example of geological conservation in the UK. But just to be on the safe side, in the 1860s a prop was put under one side of the tor, which reduces the dramatic appearance somewhat.



Does the prop do any propping?

The Cheesewring c.1861



The Cheesewring from a postcard of 1908



the **Cheesewring**

In the eighteenth century people believed that 'druids' worshipped the tors as 'rock idols', and also that the 'druids' made the rock basins on the top of some tors, to hold the blood of their (human) sacrifices.

Dr. William Borlase, the great 18th century Cornish antiquarian believed the basins were cut to hold 'holy water'.

But the basins are just the result of deep weathering. In a sub-tropical climate, maybe 40 million years ago. Rather mundane really.



Rock basin, and just water!

Today the miners and nearly all the quarrymen are gone, and the area is appreciated for other reasons. Bodmin Moor is an AONB, an Area of Outstanding Natural Beauty. People come to enjoy the tranquillity, pure air and the wide open spaces. The old mining villages give little hint of their 'Wild West' past. What would a Victorian miner say about Darite and Pensilva today? It's certain he would be astounded by the prices asked for their hastily knocked up terrace houses!

As for the ground under which they dug out the ore, and on which they dumped the waste, and had all their processing works, that is now green and nibbled by cows, sheep and ponies. There are on-going discussions about how many animals there ought to be, and how best to manage the area for wildlife, agriculture, the human inhabitants and the visitors (human and feathered).

As to the future, as the planet gets warmer, man and wildlife will adapt or migrate, but granite will remain, just weathering slightly faster. And then another Ice Age – maybe, but maybe not.

And in another few million years, when Man has joined the woolly mammoth, the dodo and the dinosaurs, what will the moor look like then?

Gorse, no doubt, will still be flowering... every month of the year (but maybe not on the moor)!