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# WALKING THE JURASSIC COAST

Dorset and East Devon:  
The walks, the rocks, the fossils



Ronald Turnbull

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THE WALKS, THE ROCKS, THE FOSSILS**

**By Ronald Turnbull**

**CICERONE**

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OXENHOLME ROAD, KENDAL, CUMBRIA LA9 7RL  
[www.cicerone.co.uk](http://www.cicerone.co.uk)

© Ronald Turnbull 2015  
 First edition 2015  
 ISBN: 978 1 85284 741 8  
 Reprinted 2017, 2019, 2021 (with updates)



Printed in Singapore by KHL using responsibly sourced paper  
 A catalogue record for this book is available from the British Library.



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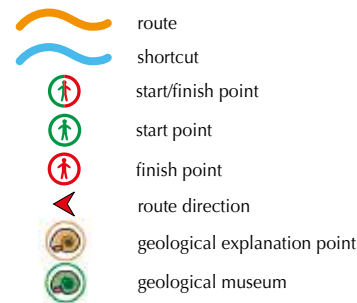
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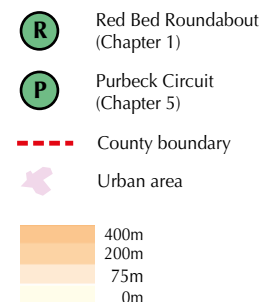
#### Route symbols on OS map extracts (for OS legend see printed OS maps)



#### GPX files

GPX files for all routes can be downloaded for free at [www.cicerone.co.uk/741/GPX](http://www.cicerone.co.uk/741/GPX).

#### Features on the overview map



### Acknowledgements

Thanks to DG Turnbull, my base in the West Country; and to Dr Ian West of Southampton University, whose huge and detailed website was much of my grounding in the geology of the Wessex Coast. That coastline moves inexorably inland; in so doing it provides a vivid re-enactment of events of 100 million years ago, but also a lot of trouble for the footpath rangers of Devon and Dorset councils and the National Trust. All walkers must appreciate their useful and unobtrusive work.

You can't walk far on this coast without seeing that the sea was once full of ammonites. Today, not one ammonite (or belemnite or plesiosaur) lives on this planet. All were wiped out by the Earth's fifth great extinction event, the comet impact of 65 million years ago. Some geologists have already identified the sixth great extinction as being right now: caused not by a comet from the outer solar system, but by us. This walking book won't contain any preachy stuff about global warming, but it's dedicated to the environmentalists, scientists, occasional politicians, and many ordinary people trying to do something about it.



## Strata of the Jurassic Coast

A quick guide to rock layers of the Jurassic Coast, youngest at the top. See also the diagram at the start of each walk and fuller explanation of strata in Appendix F.

sand & shingle	
Agglestone Grit	Tertiary: Agglestone Grit
CHALK	Chalk
GREENSAND	Greensand
GREENSAND	Greensand + unconformity
WEALDEN clay	lower Cretaceous: Wealden clay
PURBECK	Purbeck Limestone (Cretaceous/Jurassic)
PORTLAND	Jurassic: Portland Stone and Portland Sand
Kimmeridge Clay	Jurassic: Kimmeridge Clay
CORALLIAN	Jurassic: Corallian
OXFORD Clay	Jurassic: Oxford Clay
middle Jurassic Forest Marble	Middle Jurassic: sandstone, clay (incl Forest Marble)
Inferior Oolite Bridport Sands	Jurassic: Bridport Sands (and Inferior Oolite)
upper Lias	Jurassic: upper/middle Lias: sandstone, clay
Charmouth Mdstn	Jurassic: Charmouth Mudstone
BLUE LIAS	Jurassic: Blue Lias
PENARTH Group	Triassic: Penarth Group
MERCIA Mudstn	Triassic: Mercia Mudstone
OTTER Sandstone	Triassic: Otter Sandstone
B S Pebble Beds	Budleigh Salterton Pebble Bed
Aylesbeare Mdstn	Triassic: Aylsbeare Mudstone



*Ammonite and Houns Tout from Chapman's Pool (Walk 28)*

GEOLOGICAL TOPICS FEATURED ON THE WALKS		
Topic	Description	Walk no
Pebblebed Heath	moors lie on ancient riverbed pebbles	1
Budleigh Salterton Pebbles	outwash pebbles from a vanished mountain range	2
Otter Sandstone	red desert dunes, stream beds and tree roots	3
Sidmouth Red Beds	desert dunes and lake beds	4
Greensand at Salcombe Mouth	green glauconite mineral and fossil clams	4
Gypsum at Weston Mouth and Branscombe Mouth	dried-out desert salt lakes	5
Beer Stone and Beer Head Limestone	shelly limestone at the base of the chalk	6
Fossilised sea floor	former sea beds with shrimp burrows	6
Bindon Landslip	the Undercliff landslide of 1839	8
The Cobb	the Great Unconformity, and Portland Screw fossils underfoot	8
Monmouth Beach	ammonites, and the Lias layering	8
Mary Anning and Elizabeth Philpot	the all-time top fossil finder and her friend, from Lyme Regis	9
Black Ven	ammonites	9
Golden Cap: Boulder Arcs	signs of long-ago cliff collapse	10
Tsunami of 1755	the UK's second-worst tidal wave preserved in beach shingle	11
Seatown Summary	the Great Unconformity, ammonites and belemnites	11
Symondsburys's Inferior Oolite	shells, ammonites, belemnites and red snuff-box concretions	12
Shutes Lane	a Dorset hollow way	12
Eype's Mouth and Fault Corner	a fault plane and its effects on the landscape	12

GEOLOGICAL TOPICS FEATURED ON THE WALKS		
Topic	Description	Walk no
Burton Cliff and East Cliff	Lias layering in the Bridport Sands	13
Greensand Summits	Devon and Dorset's Greensand plateau	14
Flint and Chert	flint from the chalk rocks, chert from the Greensand	15
Oolite limestone	tropical limestone sand makes great Dorset buildings	16
Chesil Beach	longshore drift forms 29km of pebble beach	16
The Portland Roach	the Portland top layer with the 'Portland Screw' fossils	18
Osmington Doggers	metre-wide limestone spheroids	19
Redcliff Point	Oxford Clay and ammonites	19
Chalk Fossils	shells and an uncommon Cretaceous ammonite	20
Chalk Escarpment at Bulbarrow	Dorset's chalk plateau	21
Ham and Portland	Dorset's two special stones for building	21
The Durdle Wall: Portland and Purbeck Erect	cliffs crumpled by the Alpine mountain building	24
Fossil Forest	tree shapes preserved in algal slime	25
Mupe Bay and Wealden Clay	Lake-bed clay forms bays and a valley; carbonised tree fragments	26
Making clay at Kimmeridge Bay	rocks as they are forming: crushed ammonites, dolomite stones expanding underground	27
Chapman's Pool	oysters, ammonites and four sorts of boulders	28
Purbeck Marble	preserved snailbeds make cathedrals of England	29
Dancing Ledge	ammonites and chert	29



*Seabed ripples in Portland Stone, above Mutton Cove (Walk 18)*

## INTRODUCTION



*Durdle Door (Walk 24)*

Down at the seaside – and up on the downs. Dorset and South Devon have sweeping sea cliffs, magnificent rock architecture and hidden coves. Inland are long green ridgeways. Gentle grassland, the big sea view, and the ramparts of an Iron Age settlement make an easier morning before the strenuousness sea-level to cliff top of the coastal afternoon. And at day's end, a swim in the sea, a cold drink, and perhaps another ice cream.

It's not, however, the ice creams (splendid as they are) that make this 160km of coastline into one of only three 'natural heritage' World Sites in the UK. (The others are the Giant's Causeway coast and St Kilda; while Hadrian's Wall, Stonehenge etc are 'cultural'.) It's not just the windswept

downland, or the crashing waves below, the long views across the water, or the thyme and trefoil of the meadow slopes. The clue to the coastline's World Heritage status is contained in the name. The varied rock formations of this short coastline, the chalk and limestone and red sandstone and shale, tell a 200-million-year story that's not just the Jurassic but the later Cretaceous and earlier Trias too.

So while these small-hill and sea-side walks are enjoyable in themselves, you're missing out if you don't also spare an eye for various events of the Dinosaur times: the quartzite pebbles of Budleigh Salterton, washed by flash floods out of a mountain range somewhere to the south where today we see only the sea; tree trunks of 150 million

## INTRODUCTION

About 350 million years ago, the world's moving land masses assembled themselves into a single super-continent called Pangaea. The bit we now call Britain found itself about 20° north of the equator, deep in the middle of the continent. Far from any ocean, it was in the wash-out zone of a great mountain range (the Variscan) formed when the Pangaea continent crunched together.

Today, 20° north is the zone of the Sahara and the Gobi, and it was the same back in the Triassic Period. The sands of one great desert form the New Red Sandstone rocks of southeast Devon; and they're also in what were then the lands alongside, since separated by the opening

Atlantic: Mexico, Greenland and North America.

Sea cliffs from Exmouth to Axmouth show the swirly patterns of desert dunes. You'll also see the more intricate patterns of sandbanks in seasonal desert streams, and the pebble beds left by flash floods. There are dried out desert lakes, like the salt lakes of Death Valley today.

Deserts aren't noted for their wildlife; what you won't see in the Red Beds are fossils. Traces remain of some scrubby trees. Dinosaurs did pass through; their footprints and occasional remains are in the local museums. But for abundant life seen in the cliffs and pebbles, you'll have to move on eastwards, into the Jurassic Period.



Flint houses, Beer (Walk 6)

## WALK 1

### *Budleigh Salterton and Woodbury Castle*

<b>Start/Finish</b>	East Budleigh SY 065 848
<b>Distance</b>	19km (11 miles)
<b>Ascent</b>	300m (1000ft)
<b>Approx time</b>	5¼hrs
<b>Terrain</b>	tracks and paths
<b>Maps</b>	Explorer 115 Exmouth; Landranger 192 Exeter
<b>Parking</b>	(free) off Hayes Lane just south of East Budleigh church; also Woodbury Castle SY 032 872

The red-stained and ancient pebbles of Budleigh's sea cliff were washed down out of a mountain range that's now completely vanished away. They will easily distract any geologist from the (equally reddish-pink and rounded) human body-parts on the nudist beach below them.

Inland, the pebbles make a rather hopeless building material, or decorative cobblestone pavements. They also make a series of barren heathlands, linked together for the inland leg of this walk, which also takes in the ramparts of Woodbury Castle.

Head back on Hayes Lane to Sir Walter Raleigh pub, and turn up left to the gate into the churchyard. Pass round the church to a gate onto the lane beyond (Yettington Road).

Turn left, out of the village. The lane is narrow and nettly but little used. Pass the entrance gates to Clifton Rolle Estate, then (just before **Yettington**) turn right to follow an unsignposted lane. It rises north. After an informal parking area in woods the road dips, and bends right. Here take the bridleway track ahead.

Bear right on the main track to cross a footbridge beside a ford. The track runs uphill onto heathland. With a warning sign about the MoD Grenade Range seen ahead, turn right at a bridleway waymark. A rough path runs under trees, along the bottom edge of the heathland, with fields below the high hedge on the right.

**MERCIA Mudstn**  
**OTTER Sandstone**  
**B S Pebble Beds**

The well-washed Budleigh Salterton pebbles show their proper off-white quartzite colour without the usual red-stained surface.

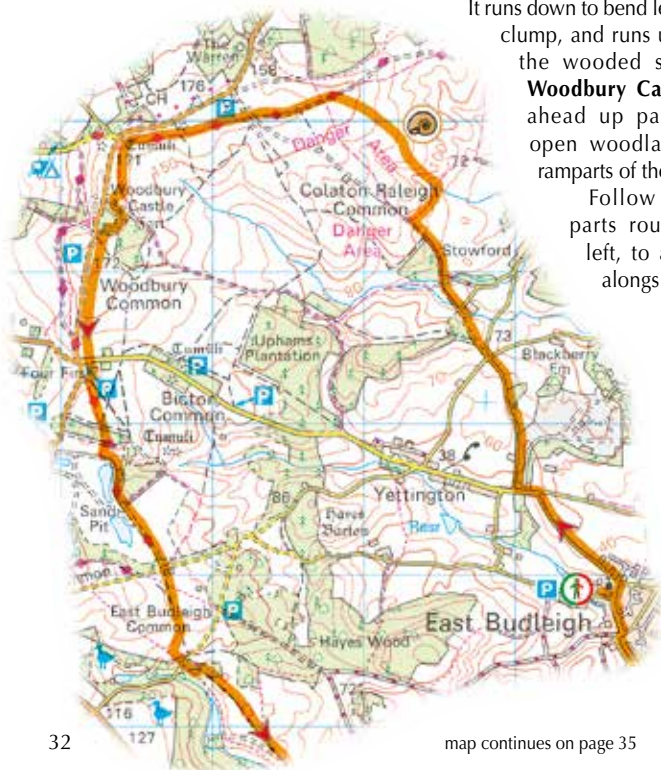
The route will now have East Devon Way markers as far as East Budleigh Common.

The path fords a stream. ◀ In another 100 metres it joins a wide, grassy track. Turn back sharp left (leaving the brideway) to follow the track uphill through the heather of **Colaton Raleigh Common**. Firing range flagpoles and warning signs are on the left. Any red flags can be ignored as this track does not run into the firing range area. As the slope eases, the track joins a wider one coming up out of the firing range, to reach in 100 metres a track junction at the crest of the heathland ridge.

Turn left on this track, with brideway markers, along the moorland crest through tall gorse. ◀ The track passes to left of a tree clump and into less gorsey ground. With the B3180 nearby on the right, the brideway forks off right but keep ahead on the main track.

It runs down to bend left at a pine clump, and runs up towards the wooded summit of **Woodbury Castle**. Keep ahead up paths under open woodland to the ramparts of the hill fort.

Follow the ramparts round to the left, to a car park alongside **B3180**.



## PEBBLEBED HEATH



Colaton Raleigh Common

The Budleigh Salterton Pebble Beds form the cliffs west of Budleigh Salterton. Quartzite pebbles are very tough: much tougher than the mudstone they're embedded in. So over much of the high ground above the Otter Valley the red mudstone has eroded away to leave just the pebbles, up to 30m deep. In the same way, at High Peak and elsewhere, chalk has eroded away leaving just its flints. Although formed in a completely different way, the quartzite pebbles are the same silica mineral as flint and chert.

The pebble beds make for well-drained, acidic soils. After Bronze Age tree clearance the soils have been mostly washed away, to leave the dry, infertile heathland today. Unfarmable and abandoned, they now form the Pebblebed Heaths series of nature reserves.

Woody, a reproduction Rhynchosaur as found at Ladram Bay in 1993, is occasionally spotted roaming on Woodbury Common. Slightly less elusive is the Dartford warbler, once almost extinct, making its comeback across these commons.

The route continues below this car park, but first cross the road and pass through more parking areas to a viewpoint board.



*Woodbury Castle scarp with views over to the River Exe and Dartmoor*

The route follows the East Devon Way markers on the ground, but this is not the same as the EDW line on maps.

You are at the edge of the **Pebblebed escarpment** – the plinth of the interpretation board is made of Budleigh Salterton pebbles. The ground ahead drops away steeply to the softer Aylesbeare Mudstones, the River Exe and distant Dartmoor.

Return across the road, to find a path at the south end of the car park, with East Devon Way marker. ◀ The path heads downhill, south, crossing a lane near **Four Firs** into another car park. Pass through it to a gate and a wide, smooth track running uphill and through a strip of pines. At their far edge, keep ahead on a small path, eroded and pebbly, downhill. Here path erosion means you can inspect a soil profile of the pebblebed heaths. The path skirts around to left of a flooded quarry hole, then joins a wider track arriving from the left. This runs ahead, between quarried areas, and up into woods to a lane.

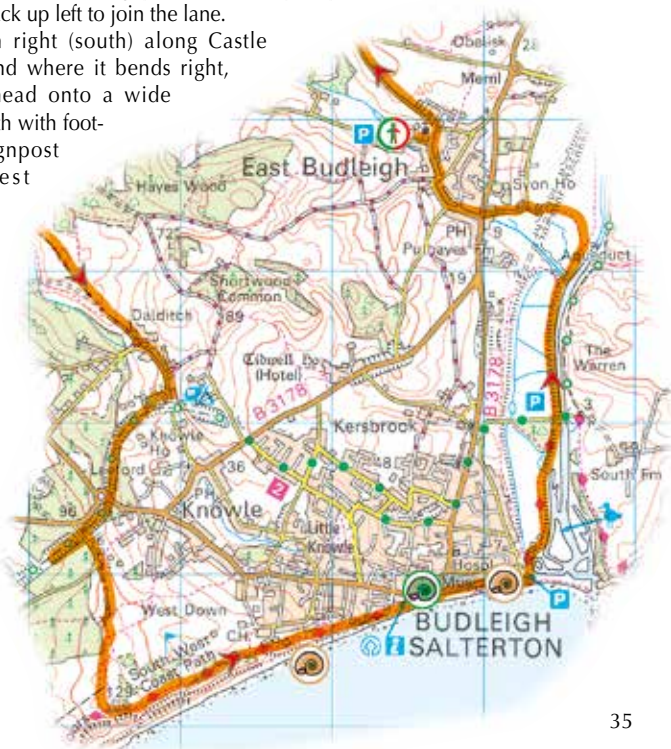
From here over **East Budleigh Common** to Squabmoor Reservoir there are many wandering paths. (Keeping roughly south will get you onto the track east of Squabmoor Reservoir; from the common you will see both the reservoir and the track to its left.) Cross the lane and keep to left of the parking area on a downhill path. After 200 metres fork right on a path over East Budleigh Common. It meets a track arriving from the right, to descend to a vehicle barrier and a small lane.

Cross onto an earth path descending into woods. At the slope foot, meet a stony track. Bear left on this, as it rises to run up to left of Squabmoor Reservoir. It runs downhill to join a lane near **Dalditch farm**.

Follow the lane ahead, bending slightly to the right, until you see a railway viaduct high ahead. Before reaching it turn up right, on a track marked 'permissive cycleway', to join the railbed cycle path. It bends up under tall spruce trees, to meet the tarmacked cycle path on the railbed.

You could divert left for the view from the viaduct. But this route turns right, following the railway path under two road bridges. To get onto the second of these, Castle Lane, either scramble up the bank on the left or continue for 200 metres to a signpost, where a cycle path heads back up left to join the lane.

Turn right (south) along Castle Lane, and where it bends right, keep ahead onto a wide earth path with foot-path signpost for West



Littleham Cove to  
Budleigh Salterton  
and beyond



The Pebblebed cliffs  
are 500 metres  
back to the right,  
see Walk 2.

If the wetland  
path is flooded, an  
alternative path runs  
north to the same  
lane. Continued to  
the east, the lane  
leads to a bridge  
over River Otter  
joining Walk 3.

At this point, behind  
a large horse chestnut  
on the left, is an old  
barn The Pound built  
of Devon cob, a mix  
of straw and red mud.

Down Beacon. The path emerges at the corner of a golf course. Keep ahead along the left edge of the golf for 200 metres, then bear right to a fingerpost. The path continues through scrubby woodland and gorse, to meet the coast path at the brink of high cliffs called **The Floors**.

Turn left on the cliff path, which descends gradually, soon in scrubby woodland. Various paths turn off left into **Budleigh Salterton**, but keep ahead on the main coast path down to the end of the shingle beach. ◀ Head along the esplanade, keeping below small seafront cliffs on the path behind beach huts (with some fossil tree roots behind them, see Walk 2).

At the village end turn left on a path around a car park to the Otter Estuary. The path follows the edge of the wetlands, past a bird hide, to a lane. ◀

Cross the lane to the continuing riverside path. Otter Sandstone is on the far bank, mixed dunes and flash flood deposits. After 1.2km, the metal Clamour Bridge is seen ahead. Just before reaching it, bear left on a footpath that crosses a concrete flood weir, then curves left on a raised flood embankment. The path becomes enclosed, then joins a track on its left to run out to the corner of a lane.

Turn left, to the **B3178** at the Rolle Arms at the edge of East Budleigh. Cross into Lower Budleigh, which becomes Middle Street. ◀ Middle Street runs north, past the Drake School, to the end of Hayes Lane below the church. The car park is to the left up the lane.

## WALK 2

### Budleigh Salterton

<b>Start/Finish</b>	East Budleigh SY 065 848
<b>Distance</b>	12.5km (7½ miles)
<b>Ascent</b>	200m (650ft)
<b>Approx time</b>	3½hrs
<b>Terrain</b>	paths and tracks
<b>Maps</b>	Explorer 115 Exmouth; Landranger 192 Exeter
<b>Parking</b>	(free) off Hayes Lane, just south of East Budleigh church

Old lanes lead to a sudden arrival at the Floors cliff tops, with a return by Budleigh Salterton and River Otter. You miss out on the Pebblebed Heaths inland (Walk 1). This could allow time for the Pebblebed cliffs west of the village, the fossil desert floor of the Otter Sandstone, the plant root traces behind the beach huts, and Budleigh's thatched museum with its 450-million-year-old seashell. Not to mention a spot of sea bathing. If you have forgotten your swimsuit, the naturist area is below the Pebblebed cliffs.

Head back on Hayes Lane to Sir Walter Raleigh pub, and turn down right (High Street) to cross a bridge. The street continues with the stream on its left.

Opposite the Drake School turn right in a tarmac then concrete track through a farm. The track continues stony and hedged up a valley floor. At crossing tracks, continue ahead on the track marked 'no entry' – this is an 'unadopted road', hence the official road sign. The track, somewhat sunken, also does duty as a stream but gets drier as it rises.

After 800 metres from the 'no entry' signs, watch out for footpath signs on both sides of the track. Take the one on the left, through a metal kissing gate. The path has a high blackthorn hedge on its left to a stile. Across this the path rises over a hilltop (**Shortwood Common**) of bramble,

MERCIA Mudstn  
OTTER Sandstone  
B S Pebble Beds



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The Jurassic Coast offers opportunities for cliff and downland walks short enough for a lazy day on the beach, or, if you prefer, as long and strenuous as anything on the hills of the British Isles.

This World Heritage coastline is named after a 60-million-year span of geology, and so the enjoyable walking is only half the story. Pause along the way to spot ammonites near Lyme Regis, the fossil forest of Lulworth Cove, Chesil Beach or the one-time red desert of Budleigh Salterton.



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