

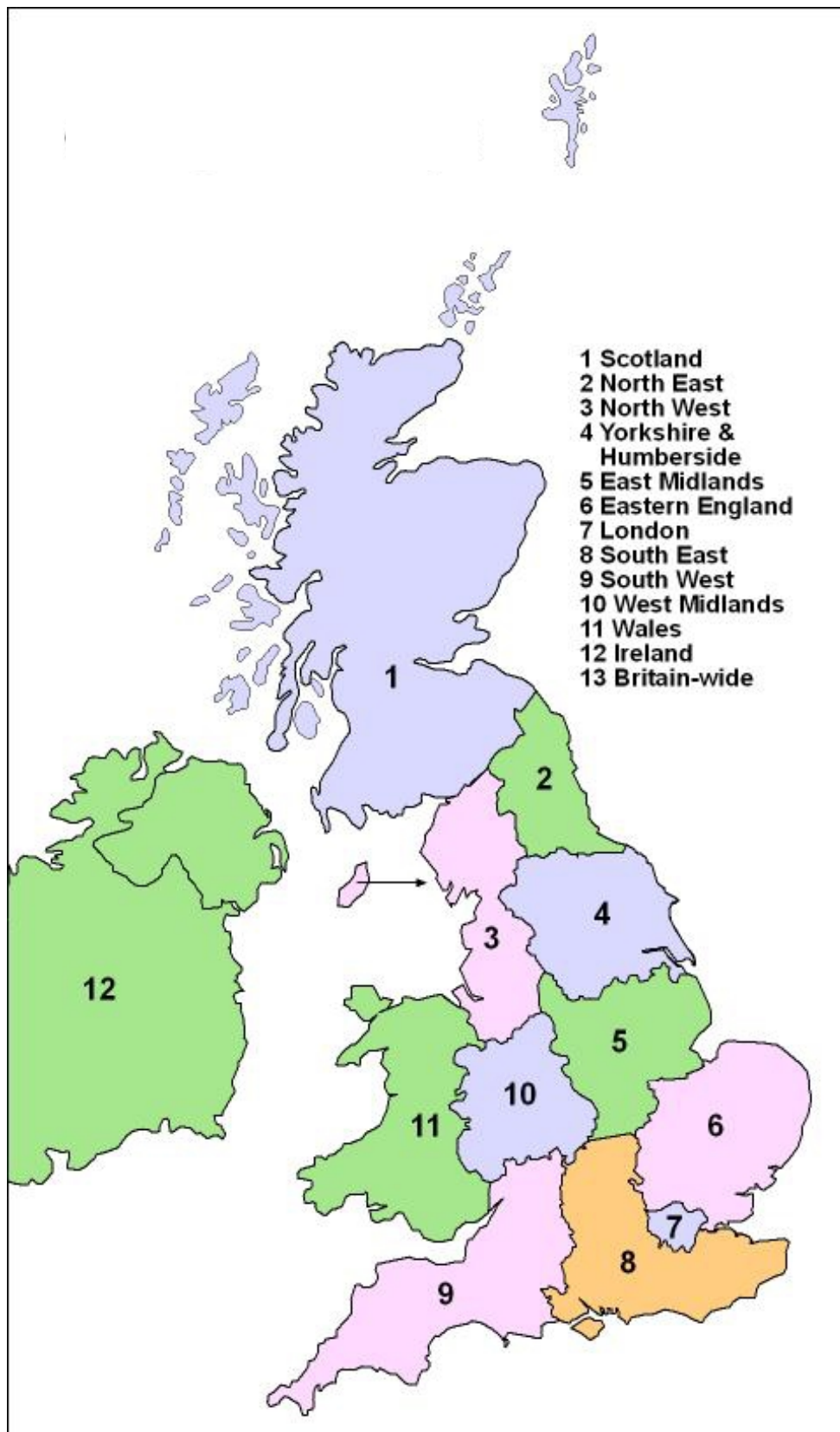
# Geotrails and Building Stone Walks produced and published by the GA and its Local and Affiliated Groups (arranged in regions)

May 2016

Link to the BGS interactive GeoBritain which shows start point of the first itinerary

[www.bgs.ac.uk/discoveringGeology/geologyOfBritain/geoBritainMap](http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/geoBritainMap)

The map shows shows the BGS Holiday Geology Guides and other useful information



- 1. Scotland** p.3
- 2. North East** p.6
- 3. North West** p.7
- 4. Yorkshire & Humberside** p.13
- 5. East Midlands** p.15
- 6. Eastern England** p.19
- 7. London** p.21
- 8. South East** p.24
- 9. South West** p.35
- 10. West Midlands** p.43
- 11. Wales** p.54
- 12. Ireland** p.65

## REGION 1: SCOTLAND

### EDINBURGH GEOLOGISTS' ASSOCIATION

[www.edinburghgeolsoc.org](http://www.edinburghgeolsoc.org)

#### **Building Stones of Edinburgh (1999)**

A. A. McMillan, R. J. Gillanders & J. A. Fairhurst

Edinburgh, 'Grey Athens of the North', owes much of its splendour to the quality of the sandstone from which most of its finest buildings are constructed. The Building Stones of Edinburgh focuses on the geological characteristics of these sandstones which were extracted from local quarries and includes within its pages examples of many of the fine buildings which have made Edinburgh famous. This book is not a geotrail.

**Cost** Members Price: £4.80, Non-Members Price: £6.00 (+P&P) [www.edinburghgeolsoc.org/p\\_sales.html#buildingstones](http://www.edinburghgeolsoc.org/p_sales.html#buildingstones)

### GEOLOGISTS' ASSOCIATION

[www.geologistsassociation.org.uk](http://www.geologistsassociation.org.uk)

**Guides Editor: Susan Marriott**

#### **GA Guide No. 32 Isle of Arran, 1989**

W.S.McKerrow and F.B.Atkins

The large variety of igneous and sedimentary rocks to be seen on the excellent coastal and island exposures, perhaps excelling any other area in the world has made the Isle of Arran so popular with geologists. The guide has been written assuming a very basic knowledge of geology on the part of the reader. After an extensive introduction to the geology of Arran the six excursions are described together with geological sketch maps. Each excursion can be carried out in seven to eight hours with an indication of a suitable lunch stop!

**Cost** Members Price: £9.00, Non-Members Price: £12.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

Need details

#### **GA Guide No. 51 A Geological Field Guide to the island of Bute, Scotland, 1995**

J.Hill & C. Buist

This guide, which has been written for the interested amateur (and to some extent, professional) geologist, has been planned in two parts, a general introductory section on the island's geology and scenery, followed by a number of itineraries where interesting geological and topological features are displayed. Maps and drawings illustrate the text and assist in explaining some fundamental principles of geology.

**Cost** Members Price: £9.00, Non-Members Price: £12.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

##### **Itinerary 1 Rothesay and Loch Fad**

This itinerary examines the line of the Highland Boundary Fault through Loch Fad and the unusual exposure of conglomerate by the eastern side of the loch.

**Start point** Natural History Museum, Stuart Street, Rothesay or by driving to the triple junction near the Kirk Dam (NS 078 627)

##### **Itinerary 2 Scalpsie bay**

The route explore the tantalising line of the Highland Boundary Fault; the relationship between the Old Red Sandstone and the Dalradian schists; important glacial features and the unusual, problematical 'Haystack'

**Start point** car park at the head of Scalpsie Bay, on the road (A844) between Ambrismore and Scalpsie Farms (NS 060 587)

##### **Itinerary 3 Bogany, Craigmore and Ascog**

The route traverses well exposed Old Red Sandstone and Carboniferous sedimentary rocks, Lower Carboniferous lavas and a suite of Permo-Carboniferous and Tertiary dykes.

**Start point** Battery Place, Rothesay opposite the Glenburn Hotel (NS 094 652)

#### **Itinerary 4 Kerrytonlia oo Bruchag Shore**

The shore route traverses Upper Red Sandstones with good sedimentary features and a suite of Carboniferous and Tertiary dykes

**Start point** Little Kilchattan Cottage (NS 105 567)

#### **Itinerary 5 Kilchattan to Glen Callum**

The itinerary covers a wealth of geological phenomena from the famous and rare columnar sandstone of Kilchattan to geological important intrusions at Hawk's Nib and Glencallum.

**Start point** the end of the road through Kilchattan (NS 108 545), by a gate.

#### **Itinerary 6 Dunagoil Bay**

One of the best coastal sections in Old Red Sandstone in Bute, a varied group of Carboniferous igneous features, displayed along the raised beach.

**Start point** park in the lay-by opposite Dunagoil Farm (NS 089 535 )

#### **Itinerary 7 Stravanan to Dunstrone Shore**

**Start point** Langalbuinloch Farm ( NS 083 567) and park down at the shore

#### **Itinerary 7a North Stravanan Shore**

This itinerary has glacial erratics on the raised beach above Old Red Sandstone and Tertiary dykes in the ORS

**Start point ?**

#### **Itinerary 7b South Stravanan Shore to Dunstrone**

This itinerary has a succession of Old Red Sandstone intruded by a thick Carboniferous sill at Dunstrone Fort

**Start point ?**

#### **Itinerary 8 Balnakailly Bay, North Bute**

This itinerary has contortions in Dalradian schists, fossiliferous late-glacial clays and raised beaches. Magnificent views

**Start point** Rhubodach Ferry Slip (NS 027 743)

#### **Itinerary 9 Ettrick Bay to Clate Point**

This itinerary has Dunoon phyllites, glacial erratics, dykes, Dalradian anticline.

**Start point** Ettrick Bay (NS 030 665)

#### **Itinerary 10 Round Bute Trail**

This itinerary is designed for the motorist: viewing landscape associated with the Highland Boundary Fault and the Dalradian schists, in contrast with the igneous scenery of South Bute.

**Start point Trail 1** 21 miles (34 km) Rothesay Pier; then Loch fad – Dunagoil - Kilchattan – Canada Hill - Rothesay

**Start point Trail 2** 32 miles (51 km) Rothesay Pier; then Kyles – Ettrick Bay – Scalpsie – Rothesay

### **GA Guide No. 67 The Dalradian of Scotland, 2009**

Jack Treagus

The Dalradian of Scotland probably offers the greatest variety of metamorphic rocks to be found in the British Isles. Here we find sedimentary rocks originally ranging in composition from muds to sandstones and conglomerates as well as a wide range of calcareous rocks and volcanics.

**Cost:** Members Price: £14.00, Non-Members Price: £17.00

[www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

### **TRAVERSE 1. THE SOUTHWEST HIGHLANDS**

#### **Excursion A West side of Loch Lomond to Crianlarich**

A drive Balogh the A82 road north from Luss, traversing the Southern Highlands Group of the Tay Nappe. The exposures of metamorphosed silts, muds and greywackes are close to the roadside and road cuttings. 6 localities listed.

**Start point** 6 km north of Helensborough NS 358 907

#### **Excursion B Excursion along the east shore of Loch Lomond.**

Traversing the Highland Boundary Fault Zone. 3 localities by foot and a further 2 by a short drive.

**Start point** the pier at Balmaha NS 416 909

#### **Excursion C Crianlarich to Tyndrum**

Crossing the inverted strata from the Southern Highlands Group to the Argyll Group. Includes examination of the Tyndrum Fault and mine. 4 localities listed.

**Start Point** is a car park on the A82 NN 344 293

#### **Excursion D Glen Orchy**

Crossing the Ben Udlaigh Syncline with exposures of garnet-mica schists and quartzite down to psammities of the Grampian Group. 5 localities listed.

**Start Point** on the B8074 NN 242 318

#### **Excursion E Moor of Rannoch and Glen Coe**

Grampian Group psammities with mineralised quartz veins, and the volcanic cauldron subsidence of Glen Coe. 3 localities listed.

**Start Point** at a lay-by on the A82 NN 306 456

#### **Excursion F Cuil Bay**

Deformed slates, phyllites and psammities seen in exposures along the shore. 4 localities listed.

**Start Point** at the village of Duror NM 990 546

#### **Excursion G Onich Shore**

A walk along the shore with folded slates and quartzites. 5 localities listed.

**Start Point** at abandoned quarry on north side of road NN 049 611

#### **Excursion H Loch Leven and the River Leven**

Folded schists and quartzites with evident cleavage. 8 localities listed.

**Start Point** at North Ballachulish village NN 060 617

#### **Excursion J The west coast of Argyll; Benderloch, Kerrera and the Pass of Brander**

Lower Devonian conglomerates and sandstones unconformably on the Dalradian. 2 localities listed.

**Start Point** at a lay by on the A828 at Polanach NM 937 502

#### **Excursion K Kerrera, Connel Bridge to Tyndrum via the Pass of Brander**

The sub-Dalradian unconformity between the Easdale Slates and the Devonian Conglomerates.

**Start Point** at a parking area north of Gallanach NM 835 283

### **TRAVERSE II. THE CENTRAL HIGHLANDS**

#### **Excursion L Glen Shee to Rotmell**

Crossing the inverted limb of the Tay Nappe and the 'Flat Belt' in the Tay Valley. 5 Localities listed.

**Start Point** just after a ford on a minor road NN 988 340

#### **Excursion M Ben Lawers and Glen Lyon**

The inverted grewackes and schists of the Southern Highland Group overlain by the Loch Tay Limestone and the schists of the Argyll Group. 9 localities listed.

**Start Point** in the National Trust car park NN 610 380

#### **Excursion N The Loch Tay Fault zone**

Fault gouge and slickensides. 5 localities listed.

**Start Point** up the track from Glenlyon House NN 736 486

#### **Excursion P The Schiehallion area**

Explores the metamorphic rocks in downward stratigraphic succession from the Schiehallion Quartzites of the Islay Subgroup to the Grampian Group. Arranged as six sub-excursions.

Strath Fionan south side, Strath Fionan north side, Mid Strath Fionan, Lochan an Daimh, Tempair Burn, Boundary Slide Zone.

**Start Point** in Forestry Commission car park NN 753 557

#### **Excursion Q Glen Garry**

The complex double folding of severely deformed metamorphics. 10 localities listed.

**Start Point** at a car park on the old A9 NN 823 661

### **TRAVERSE III. THE BANFF COAST**

#### **Excursion R East of Cullen**

Coastal section of quartzite and folded psammities. 3 localities listed.

**Start Point** at Seatown NJ 520 678

#### **Excursion S Sandend Bay**

Covering the transition from the Garron Point formation to the Sandend Limestone Formation. 3 localities listed.

**Start Point** at Garron Point NJ 555 670

#### **Excursion T West of Portsoy**

Durnhill Quartzite, Portsoy Formation to gabbro intrusion and Cowhythe Gneiss. 5 localities listed.

**Start Point** in car park at Portsoy NJ 583 664

**Excursion U Hythe and Boyne Bays**

Cowhythe Gneiss and Boyne Limestone Formation. 2 localities listed.

**Start Point** on minor road to Boyne quarry NJ 614 653

**Excursion V Whitehills**

The Whitehills Grit Formation. 1 locality.

**Start Point** on a minor road near the shore NJ 665 650

**Excursion W Boyndie Bay**

The Boyndie Syncline with metamorphosed greywacke. 3 localities listed.

**Start Point** at a parking area NJ 681 646

**Excursion X Coast east of Macduff**

The Macduff Slate Formation on the flat limb of the Boyndie Syncline. 3 localities listed.

**Start Point** on Moray Street, Macduff NJ 712 646

## REGION 2: NORTH EAST

### GEOLOGISTS' ASSOCIATION

[www.geologistsassociation.org.uk](http://www.geologistsassociation.org.uk)

Guides Editor: Susan Marriott

#### GA Guide No. 59 Geology of Hadrian's Wall, 1997

G.A.L.Johnson

The geology of Hadrian's Wall falls naturally into three sectors: in the East the wall is over Upper Carboniferous Coal Measures and Millstone Grit; the Central Section is underlain by Lower Carboniferous intruded by the Great Whin Sill and in the Western sector the Wall crosses the New Red Sandstone. Glacial drift is widespread.

**Cost:** Members Price: £9.00, Non-Members Price: £12.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

##### **Eastern Sector**

**Start point** Wallsend (NZ 300 660), on the north bank of the River Tyne, at the excavated Roman fort and reconstructed gatehouse.

##### **Central Sector**

Only in the central sector is bedrock well exposed, and this is at its most dramatic along the Whin Sill.

**Start point** Chollerford Bridge (NY 920 705), the site of a Roman bridge over the North Tyne.

##### **Western Sector**

**Start point** Lanercost Bridge (NY 548 621), then west through Carlisle, and along the southern shore of the Solway Firth.

### NORTH EAST GEOLOGICAL SOCIETY

[www.rocksofthenorth.co.uk](http://www.rocksofthenorth.co.uk)

Dr Andy Lane

[andy.lane3@ntlworld.com](mailto:andy.lane3@ntlworld.com)

#### **Bedrock and Building Stones – Geology exposed in the City of Sunderland**

Dr Andy Lane, 2014

The publication describes the geological history, solid rock and building stones to be found in and around Sunderland, and includes *four easy guided walks* to be taken independently or to support the main text.

**Start Point** all within City of Sunderland

**Cost** £14.50 via the website [www.rocksofthenorth.co.uk](http://www.rocksofthenorth.co.uk)

## REGION 3: NORTH WEST

### CUMBRIA GEOCONSERVATION

[www.cumbriarigs.co.uk](http://www.cumbriarigs.co.uk)

Contact re Publications: Michael Dewey via [www.cumbriarigs.co.uk](http://www.cumbriarigs.co.uk)

Email: [www.cumbriarigs.co.uk/&mailform](mailto:www.cumbriarigs.co.uk/&mailform)

#### 1. Rocks and Landscape of Alston, 2003

Barry Webb, Brian Young

In the course of two walks in the Nent Valley the authors describe the rocks, fossils and minerals and unravel clues about how today's rocks and landscapes were formed, what the North Pennines area was like in the past and how men have exploited the geological richness of Alston Moor.

**Start point** Alston NY 722467

**Cost** £2.00 via [www.cumbriarigs.co.uk](http://www.cumbriarigs.co.uk)

#### 2. Geology, Scenery and History. A walk in Yewdale northeast of Coniston, 2004

Murray Mitchell

An important geological boundary can be traced across Yewdale, and it has a dramatic effect on the scenery. The Ordovician Borrowdale Volcanic Group rocks, the eroded remnants of ancient volcanoes, form the high ground to the NW, and are overlain by sedimentary strata of the Ordovician and Silurian Windermere Supergroup which form the rolling low hills to the SE.

**Start point** Coniston car park SD 303977

**Cost** £3.00 via [www.cumbriarigs.co.uk/?Publications](http://www.cumbriarigs.co.uk/?Publications)

#### 3. A Geological Trail over the Garburn Pass, 2010

Michael Dewey

The walk is predominantly on Windermere Supergroup rocks. The rocks were laid down into a subsiding basin 443 to 410 million years ago that was part of an ocean named the Iapetus.

**Start point** Dubbs Road, NY 424006

**Cost** Free or can be downloaded from website: [www.cumbriarigs.co.uk/?Geological\\_Trails](http://www.cumbriarigs.co.uk/?Geological_Trails)

#### 4. A Geological Trail from St Bees to Whitehaven, 2010

Jim Samson

A cliff path from St Bees to Whitehaven. A journey through the ancient past of this beautiful part of Britain. You will see rocks that range from over 250 million years old to pebbles that were brought here by sheets of ice mere thousands of years ago.

**Start point** St Bees NX 961118

**Cost** Free [www.cumbriarigs.co.uk](http://www.cumbriarigs.co.uk)

#### 5. Geological Sites to Visit on Cunswick Fell and Scout Scar, 2010

Michael Dewey

A walk around these ridges just to the west of Kendal looking at features which can be seen in the Carboniferous limestone

**Start point** Queens Road, Kendal SD512928

Currently out of print but can be downloaded free from the website: [www.cumbriarigs.co.uk/?Geological\\_Trails](http://www.cumbriarigs.co.uk/?Geological_Trails)

### GEOLANCASHIRE (Lancashire RIGS Group/Lancashire Local Group of the GA)

[www.geolancashire.org.uk](http://www.geolancashire.org.uk)

Email: [info@lancashirerigs.org.uk](mailto:info@lancashirerigs.org.uk)

#### Ribble Valley Geotrails Walk 1 Preston, 2013



GeoLancashire

A circular walk along the Ribble Way long distance footpath, between two river crossings in Preston, examining natural features and building stones.

**Start point** Pentwortham Old Bridge, Preston SD 529 283

**Cost** free: [www.geolancashire.org.uk/preston-geo-trail.html](http://www.geolancashire.org.uk/preston-geo-trail.html)

### **Ribble Valley Geotrails Walk 2 Brockholes, 2013**

GeoLancashire

A circular walk along the Ribble Way long distance footpath where it crosses the Lancashire Wildlife Trust's reserve at Brockholes, examining natural features and the results of sand and gravel workings in a glacial deposit of material from SW Scotland, the Lake District and the Yorkshire Dales.

**Start point** Brockholes Welcome Centre SD585 305

**Cost** free: [www.geolancashire.org.uk/brockholes-geo-trail.html](http://www.geolancashire.org.uk/brockholes-geo-trail.html)

### **Ribble Valley Geotrails Walk 3 Ribchester, 2014**

GeoLancashire

A circular walk along the Ribble Way long distance footpath in the vicinity of Ribchester, examining natural features including the river meanders and the erosion of part of the Roman fort.

**Start point** Car park at SD 653 354

**Cost** free: [www.geolancashire.org.uk/ribchester-geo-trail.html](http://www.geolancashire.org.uk/ribchester-geo-trail.html)

### **Ribble Valley Geotrails Walk 4 Dinckley Gorge, 2013**

GeoLancashire

A circular walk along the Ribble Way long distance footpath upstream of Ribchester, examining natural features including the contrasting valley forms where resistant sandstone form a gorge while less resistant shales create a large circular 'pool'.

**Start point** Marles Wood car park SD 676 357

**Cost** free: [www.geolancashire.org.uk/dinckley-geo-trail.html](http://www.geolancashire.org.uk/dinckley-geo-trail.html)

### **Ribble Valley Geotrails Walk 5 Clitheroe, 2014**

GeoLancashire

A circular walk along the Ribble Way long distance footpath in the Clitheroe area, examining natural features of the limestone landscape and some aspects of the cement industry including quarrying for limestone.

**Start point** Clitheroe Castle SD 743 417

**Cost** free: [www.geolancashire.org.uk/clitheroe-geo-trail.html](http://www.geolancashire.org.uk/clitheroe-geo-trail.html)

### **Ribble Valley Geotrails Walk 6 Long Preston Geotrail, 2014**

GeoLancashire

A circular walk along the Ribble Way long distance footpath in the Long Preston area, examining the impact on the landscape of the last glaciation including a drumlin field.

**Start point** Long Preston SD 834 582

**Cost** free: [www.geolancashire.org.uk/long-preston-geotrail.html](http://www.geolancashire.org.uk/long-preston-geotrail.html)

### **Ribble Valley Geotrails Walk 11 Shedden, 2014**

GeoLancashire

A circular walk in the valley of the river Brun, a tributary of the rivers Calder and Ribble, examining the landscape which has been shaped by 'hushing' for limestone in the glacial till over several hundred years until 1800.

**Start point** Maiden's Cross car park SD 893 288

**Cost** free: [www.geolancashire.org.uk/shedden-geo-trail.html](http://www.geolancashire.org.uk/shedden-geo-trail.html)

### **The Hodder Valley Field Guide, 2009**

GeoLancashire

This guide explores a number of sites in the upper Hodder catchment which demonstrate the present-day and historical processes have shaped this river valley and channel.

**Start point** Longridge Fell SD 639 402

**Cost** donation & cost of postage requested: [www.geolancashire.org.uk/indexf703.html](http://www.geolancashire.org.uk/indexf703.html)

### **Clougha, Crook o'Lune and Conder valley**

GeoLancashire

Located east and southeast of Lancaster, the guide explains how meltwater from the last icesheet shaped the landscape as it poured down the Lune valley.

**Start point** Windy Clough SD527 603

**Cost** donation & cost of postage requested: [www.geolancashire.org.uk/indexf703.html](http://www.geolancashire.org.uk/indexf703.html)

### **Jumbles Country Park Landscape Trail Guide, 2009**

GeoLancashire

A circular walk which visits an impressive fossil tree, a fault, a meltwater channel and a viewpoint from where the geology and landscape are explained.

**Start point** Jumbles Quarry (SD734 149)

**Cost** donation & cost of postage requested: [www.geolancashire.org.uk/indexf703.html](http://www.geolancashire.org.uk/indexf703.html)

### **White Coppice, 2003**

GeoLancashire

This guide explores the gritstone rocks, lead mining and quarrying visible along Dean Brook at White Coppice, Chorley.

**Start point** White Coppice SD614 191

**Cost** donation & cost of postage requested: [www.geolancashire.org.uk/indexf703.html](http://www.geolancashire.org.uk/indexf703.html)

### **Beacon Fell Country Park 2008**

GeoLancashire

This guide explores the geology beneath your feet and the processes which have produced the landscapes visible from this fine viewpoint from Snowdonia to the Lake District.

**Start point** Visitor Centre SD565 427

Cost donation & cost of postage requested: [www.geolancashire.org.uk/indexf703.html](http://www.geolancashire.org.uk/indexf703.html)

## **The Geology and Landscapes of Lancashire 2008**

Eds. Keith Williams and Jennifer Rhodes

An introduction to the main landscape types found in Lancashire, the landform processes that have produced them and their relationship to the underlying geology.

Cost donation & cost of postage requested: [www.geolancashire.org.uk/indexf703.html](http://www.geolancashire.org.uk/indexf703.html)

## **GEOLOGISTS' ASSOCIATION**

[www.geologistsassociation.org.uk](http://www.geologistsassociation.org.uk)

**Guides Editor: Susan Marriott**

### **GA Guide No. 2 Geology of the Lake District, 1990**

Each of the 25 itineraries is produced by an expert on the ground. The guide is designed to be used with topographical maps.

**Cost:** Members Price: £12.00, Non-Members Price: £15.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

#### **Itinerary 1 A geological road map of the Lake District**

Four routes covering 66 Localities traverse the 1) Keswick area, 2) Keswick–Ambleside–Ullswater, 3) Penrith to Kendal, and 4) Ambleside, Coniston, Duddon, Eskdale, and Langdale.

**Start Point** Hodgson How Quarry NY 244236

#### **Itinerary 2 Mungrisdale and the Caldew Valley**

The main purpose of this excursion to 21 Localities is to examine the Skiddaw Slates, some of which are within the aureole of the Skiddaw Granite.

**Start Point** School-House Quarry NY 363 305

#### **Itinerary 3 The Carrock Fell Igneous Complex**

Visits to 15 Localities take in the Mosedale series and the Carrock series.

**Start Point** NY 355 324

#### **Itinerary 4 The Skiddaw Group of Hope Beck, Hopegill Head and Gasgale Gill**

This excursion via 21 Localities examines the stratigraphy and sedimentology of the Skiddaw Group north of the Causey Pike Thrust. It also looks at hornfelsed Skiddaw Group at the north edge of the Crummock Water Aureole. The sequence is Arenig in age and of a turbidity current origin.

**Start Point** Hope Beck NY 1692 2418 or Lanthwaite Green car park NY 1588 2076

#### **Itinerary 5 The Buttermere Formation (Skiddaw Group) in the Robinson Area**

The Buttermere Formation is a slump mass or olistrostrom, and the purpose of this excursion is to examine its primary structure. This excursion is most suitable for those with sufficient grasp of structural geology. 9 Localities.

**Start Point** Robinson NY 201 168

### **Itinerary 6 The Skiddaw Group of Stoneycroft Gill, Causey Pike and Outerside**

This itinerary can be divided into half-day (8 Localities, 2km walking, 150m ascent) or full day (17 Localities, 6km walking, 500m ascent). To be seen are the olistostromic Buttermere Formation (and Robinson Member), the normal siltstone facies (Kirkstile Slates) and its alteration by hornfelsing, the thrusting of the hornfelsed strata over unaltered rock, and turbidite sequences both right-way-up and inverted.

**Start Point** Barrow Mine NY 2332 2173

### **Itinerary 7 Devoke Water and Yoadcastle**

This half-to-whole day excursion examines the Eskdale Granite and its contact relationships with the Skiddaw and Borrowdale Volcanic Groups. The trip is 7km over tough fellside, climbing 240m. 6 Localities.

**Start Point** crossroads at SD 1708 9770

### **Itinerary 8 Upper Eskdale to Scar Lathing and Silverybield Crag**

This full-day excursion on open fellside examines mainly thick, compound, basalt lavas of the Birker Fell Formation of the Borrowdale Volcanic Group. The 9km route ascending 400m visits 9 Localities.

**Start Point** Brothelkeld NY2125 0140

### **Itinerary 9 Cockley Beck – Grey Friar**

This whole-day excursion visits 11 Localities via 5km over rough fellside and a climb of 600m. Examined are the lower part of the Borrowdale Volcanic Group succession on the southern limb of the Wrynose Anticline.

**Start Point** Cockley Beck Bridge NY 246 017

### **Itinerary 10 Hard Knott, Eskdale**

This excursion demonstrates various aspects of the volcanic geology of the Birker Fell Formation and also a sequence of later, acid pyroclastic deposits which have a steep, unconformable relationship with the earlier lava pile. 8 Localities are visited via 6km over open fell, ascending 450m.

**Start Point** Hard Knott NY 2133 0108

### **Itinerary 11 Harter Fell, Dunnerdale**

This half- to three-quarters day round-trip takes in 7 Localities over 5 rough, steep kilometres, ascending 470m over Harter Fell. The Birker Fell Formation here contains important widespread marker horizons.

**Start Point** Dunnerdale Forest SD 2350 9955

### **Itinerary 12 Buckbarrow and Middle Fell, Wasdale**

This full day's trip to Wasdale provides the opportunity to study the lower part of the Borrowdale Volcanic Group together with the southern part of the Ennerdale Granophyre. The 6km route and 600m ascent over rough terrain requires strenuous walking to 13 Localities..

**Start Point** Greendale NY 1435 0563

### **Itinerary 13 Holehouse Gill**

The purpose of the half-day excursion is to examine the marine strata of the Holehouse Gill Formation in the type section, and its relationship with the strata within the Borrowdale Volcanic Group. Walking 3km through rough pasture takes you to 5 Localities.

**Start Point** Ulpha Bobbin Mill SD 190 925

### **Itinerary 14 Ulpha – Kiln Bank Cross**

The aim of this half-day excursion is to examine higher parts of the Borrowdale Volcanic Group preserved within the major volcanotectonic basin centred near Ulpha. Volcanic and sedimentological features of a sequence of andesite and ignimbrite with interbedded epiclastic tuff are illustrated. The itinerary covers 5 Localities in 3km walking and 300m ascent mostly over rough bracken-covered fellside.

**Start Point** Ulpha Bridge SD 197 929

### **Itinerary 15 Coniston to Levers Water**

This whole day excursion combines a study of volcanic processes within the upper part of the Borrowdale Volcanic Group with an examination of the remains of what was one of Britain's most important copper mining areas. 14 Localities over 7km of well-marked tracks and 470m ascent.

**Start Point** Round How SD 2985 9800

### **Itinerary 16 Nab Gill Mine, Eskdale**

This excursion demonstrates textural variation within the Eskdale Granite together with hematite mineralisation in fault veins in the intrusion. 6 Localities along well-defined paths ascending 180m.

**Start Point** Dalegarth Station NY 1730 0071

### **Itinerary 17 Explosive volcanism and volcanotectonic subsidence at Crinkle Craggs**

This excursion covers part of the Borrowdale Volcanic Group via 10 Localities that show typical evolution of a large basalt-rhyodacite ensialic arc volcano, in which early construction of basalt and andesite stratovolcanoes was followed by more acidic and much more violently explosive activity accompanied by major volcanotectonic subsidence, resulting in a caldera lake. The itinerary involves a full day's rough hill walking (9km) and best done on a clear summer's day.

**Start Point** Wrynose Pass NY 278 026

### **Itinerary 18 Subaerial pyroclastics of Side Pike, Langdale**

This short excursion provides an opportunity to examine good exposures of subaerially-emplaced pyroclastic rocks, where the deposits of fall, surge and flow may be recognised and distinguished from reworked volcanoclastic sediments. The 8 Localities can be toured in 2.5 hours even in poor weather.

**Start Point** cattle grid NY 2895 0510

### **Itinerary 19 The Tilberthwaite Tuffs from Langdale to Tilberthwaite**

In the heavily quarried area of Tilberthwaite tuffs can be seen an infinite variety of sedimentary structure including horizontal, convolute and cross lamination, flute and load casts, flame structures,

graded bedding, complex slumps and accretionary lapilli. This one-day's itinerary of 15km and 400m ascent can be divided into 3 Tours (A: Localities 1–8; B: 9–10; C: 11–15).

**Start Point** Chapel Stile NY 316 056

### **Itinerary 20 The Lower Borrowdale Volcanic Group of Brown Knotts, Borrowdale**

This excursion demonstrates the lower andesitic part of the Borrowdale Volcanic Group, which shows here a mainly subaerial pile of andesite block lava flows, with interbedded reworked volcanoclastic sediments, deposited in alluvial and lacustrine environments, and subordinate pyroclastics. The rocks belong to the Falcon rag Formation and the lower part of the Thirlmere Andesites. 5 localities for a half or full day.

**Start Point** Cat Gill NY 269 209

### **Itinerary 21 The Borrowdale Volcanic Group at Seathwaite, Borrowdale**

This section illustrates correlatives of pyroclastic sequences described at Crinkle Craggs to demonstrate how the volcanoclastic facies change laterally. Half or full day at 9 Localities.

**Start Point** Seathwaite Farm NY 235 122

### **Itinerary 22 The upper Borrowdale Volcanics and lower Windermere Group S.W. of Coniston**

A walk across open moorland to 22 Localities reveals the outcrop pattern of wrench faults and bedding thrusts of the Caledonian Orogeny. Also viewable is the Caradoc unconformity between the Borrowdale Volcanic Group and the Consiton Limestone Formation, whilst the Ordovician-Silurian boundary is completely exposed with the Ordovician Ashgill Shale followed by the richly graptolitic Skelgill Shales of Llandovery age.

**Start Point** Boo Tarn SD 282 986

### **Itinerary 23 Longsleddale, Stockdale and Brow Gill**

This excursion of 5km and 10 Localities focuses on the Windermere Group (late Ordovician and Silurian) of the eastern Lake District. Included are the classic localities of Stockdale Beck and Brow Gill, the type localities of the Longsleddale and Stile End Members of the late Ordovician Consiton Limestone Formation, and the nature and field relationships of the Stockdale (Yarlside) Rhyolite.

**Start Point** Stockdale Beck NY 4915 0539

### **Itinerary 24 Kentmere**

This 8km itinerary through 12 Localities examines Silurian rocks of the Windermere Group in a glacially modified landscape. The strata seen, from the Brathay Flags Formation to the Bannisdale Slate Formation, consist of mudstone, siltstone and sandstone.

**Start Point** Kentmere Church NY 4563 0410

### **Itinerary 25 The Westphalian and Permian Geology of the Whitehaven Area**

This excursion visits Upper Carboniferous (Westphalian) and Permo-Triassic sedimentary rocks in cliffs and quarries around Whitehaven. Rocks of Westphalian B and C age and the unconformity with the overlying Permo-Triassic rocks are featured. Transport is needed between the 5 Localities.

**Start Point** Bransty Cliff NX 9750 1880

## **GA Guide No. 46 The Geology of the Isle of Man, 2013**

Trevor D. Ford, David Burnett and David Quirk

The aim of the guide is to help professional and interested amateur geologists to investigate the rocks themselves and to put them in a modern scientific context. The guide provides an overview of the geology of the island and describes excursions to specific locations with a wide variety of geological features, mostly easily accessible on the foreshore.

**Cost:** Members Price: £9.00, Non-Members Price: £12.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

### **Itinerary 1** Lower Palaeozoic – Manx and Dalby Groups

**Start point** Car park down the narrow lane east of the Groudle Glen restaurant on the coastal road north from Douglas (A 211) at SC 430 784. The beach at Port Groudle is at SC 421 782 (Port = Bay in Manx)

### **Itinerary 2** Granites and Mines

**Start point** Foxdale granite and Spar Quarry reached by a minor road west of Eairy. A track leads to the entrance of Spar Quarry SC 288 777

### **Itinerary 3** Peel Group

**Start point** Car park at the north end of Peel Promenade SC 250 845

### **Itinerary 4** Carboniferous Limestone. The itinerary includes Poyllvaaish, famous for its black 'marble'

**Start point** old Langess copper mine SC 284 659 via the road to Langness lighthouse

### **Itinerary 5** Scarlett Volcanics

**Start point** continuation from Poyllvaaish (Itinerary 4). 5.1 is just below the ancient earth works at Close-ny-Chollagh Point Sc 246 671

### **Itinerary 6** Tertiary Dykes

**Start point** Port Mooar, Maughold Head SC 487 906

### **Itinerary 7** Quaternary of the Northwest Coast

**Start point** Glen Mooar SC 302 894

### **Itinerary 8** Quaternary of the Northeast Coast

**Start point** Ballure, Ramsey, park on the pier at Ramsey SC 456 939

## **MANCHESTER GEOLOGICAL ASSOCIATION**

[www.mangeolassoc.org.uk](http://www.mangeolassoc.org.uk)

Contact re Publications: Jennifer Rhodes Email [lgga.info@gmail.com](mailto:lgga.info@gmail.com)

## **A Building Stones Guide to Central Manchester, 2014**

Morven Simpson and Fred Broadhurst, fully revised by Peter del Strother and Jennifer Rhodes.  
ISBN 978-0-9928713-1-4

A fully illustrated book containing four walks of 1-2km each, around the centre of Manchester to describe the variety of building stones to be found there.

**Start points** Walk A at the Cenotaph beside the iconic Town Hall

Walks B & C on Market Street at the heart of the city's shopping area

Walk D begins at the Town Hall Extension on Mount Street.

**Cost** £6.00 + £2.50 p&p from J Rhodes [www.mangeolassoc.org.uk](http://www.mangeolassoc.org.uk)



# REGION 4: YORKSHIRE & HUMBERSIDE

## GEOLOGISTS' ASSOCIATION

[www.geologistsassociation.org.uk](http://www.geologistsassociation.org.uk)

**Guides Editor: Susan Marriott**

### **GA Guide No. 34 The Yorkshire Coast, 1992**

P.F.Rawson & J.K.Wright

The Yorkshire coast provides magnificent exposures of Jurassic and Cretaceous rocks. The coastal area is now firmly established as a standard for comparison with both the less well exposed areas inland and also for the offshore North Sea basins. Although there has been serious overcollecting from many of the best known coastal sites, excellent specimens can be picked up loose at many of the localities described.

**Cost:** Members Price: £9.00, Non-Members Price: £12.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

#### **Itinerary 1 Staithes to Port Mulgrave**

The 3 km stretch of coastline between Staithes and Port Mulgrave provides a magnificent series of exposures of the Lower Jurassic Staithes Sandstone, Cleveland Ironstone and lower Whitby Mudstone Formations. The route is mainly over a rocky wave-cut platform and a falling tide is essential as the rising sea reaches the foot of the cliff in places by about mid-tide.

**Start Point** Staithes NZ 784 188

#### **Itinerary 2 Saltwick Bay to Whitby**

This short excursion examines the Whitby Mudstone Formation and part of the Ravenscar group. It follows the cliff-top path from Whitby Abbey to Saltwick Bay, descends to the shore at Saltwick and returns along the base of the cliffs to the east side of Whitby Harbour. This is strictly a low tide itinerary and it should not be started on a rising tide.

**Start Point** Saltwick Bay NZ 915 108

#### **Itinerary 3 Robin Hood's Bay**

Robin Hood's Bay provides excellent exposures of the Redcar Mudstone Formation and, in the central part of the bay, of Devensian (Pleistocene) tills. It is neither practical nor necessary to follow the sequence the whole way round the bay in one day.

**Start Point** the Bay is accessible from four directions; best fossil locality is NZ 972 025

#### **Itinerary 4 Blea Wyke Point and Ravenscar**

Strenuous; the route is along the rock platform and over beach boundaries for 2km from Peak Steel to south of Blea Wyke Point.

**Start Point** Ravenscar NZ 980 014. Path takes off from the bend of the road NW of Ravenscar Hall Hotel.

#### **Itinerary 5 Claughton Wyke to Scalby Ness**

This itinerary provides a traverse through part of the Ravenscar Group, from the Lebberton Member (millepore bed) to the Scalby Formation. Includes Members: Mulgrave Shale, Alum Shale, Peak Mudstone, Fox Cliff Siltstone, plus Blea Wyke and Dogger Formations.

**Start Point** car park at Cloughton Wyke TA 019 949

### **Itinerary 6 Egton Bridge and Goathland**

This short excursion by car or minibus tours the southern side of the Esk Valley, focussing on the effects of the last (Devensian) glaciation upon the topography and drainage pattern. Minimal walking except to ford Eller Beck.

**Start Point** NZ 798 053

### **Itinerary 7 South Bay, Scarborough, Cayton Bay and Gristhorpe Bay**

This itinerary demonstrates Middle and Upper Jurassic sequences south of Scarborough along the beach and rock platform. Best done on a falling tide (one point impassable within 3 hours of high tide).

**Start Point** South Bay, Scarborough TA 048 871

### **Itinerary 8 Filey Brigg**

This is a half-day excursion examining the uppermost Lower Calcareous Grit Formation (Saintoft Member) and the lower part of the Coralline Oolite Formation in the wave-cut platform and low cliff.

**Start Point** Cliff-top car park, Filey Brigg TA 119 811

### **Itinerary 9 Castle Hill, Scarborough and the Hackness Hills**

The itinerary demonstrates the relationships of sedentary facies and fossils contained in the varied series of limestones and sandstones which make up the major Coralline Oolite Formation.

**Start Point** Scarborough Castle TA 048 891

### **Itinerary 10 Reighton Gap to Speeton Cliffs**

Walking along the beach allows inspection of the Kimmeridge Clay and Speeton Clay Formations underfoot. Beneath boulder clay in the cliff are Speeton Clay. At Red Cliff Hole, the Chalk Group and Hunstanton Formation are visible.

**Start Point** Reighton Sands holiday village parking area TA 140 763

### **Itinerary 11 Thornwick Bay and North Landing, Flamborough**

The chalk cliffs on this walk are of interest primarily to show how this single, ill-defined Chalk zone can be subdivided lithologically: Welton Chalk Formation overlain by the Burnham Formation containing marl and flint bands.

**Start Point** Thornwick Bay Café parking area TA 231 722

### **Itinerary 12 Flamborough Head**

Here the chalk cliffs and foreshore are formed by the flint-bearing Burham Chalk Formation overlain by the flintless Flamborough Chalk Formation. The main feature of geological interest is a zone of intense deformation running E-W through the bay, showing N-S compression followed by N-S tension, both phases being related to the Tertiary Alpine Orogeny.

**Start Point** Lighthouse parking area, Flamborough Head TA 254 706

### **Itinerary 13 South Landing to Sewerby Steps**

On both sides of South Landing, drift deposits mark a glacial melt-water channel cut through the chalk; a chalk sequence distorted by folding or faulting reflects a deep-seated structure in the Howardian-Flamborough Fault Belt. The Flamborough Formation is exposed along the coast, while Beacon Hill Farm Marls lie below Beacon Hill. Best at low tide. The buried cliff at Sewerby Steps includes the Sewerby Gravels, Skipsea Till over the chalk.

**Start Point** Parking area at Living Seas Centre, South Landing TA 230 695

### **Itinerary 14 Langtoft, Foxholes and Staxton Hill**

This itinerary links three localities along the B1249, which runs northwards across the Wolds from Driffild to Staxton. Two show inland exposures of chalk shatter zones in roadside disused quarries; Staxton Hill is an excellent viewpoint from which the glacial history of the Vale of Pickering area can be demonstrated.

**Start Point** Rudstone village TA 098 678

## **HULL GEOLOGICAL SOCIETY**

[www.hullgeolsoc.org.uk/fishtrail.htm](http://www.hullgeolsoc.org.uk/fishtrail.htm)

Email: Mike Horne [mike.horne@chem.hull.uk](mailto:mike.horne@chem.hull.uk)

### **The Geology of the Hull Fish Trail**

Mike Horne

In 1992 the Hull City Council created a fish Pavement trail through the Old Town of Hull, sponsored by Seven Seas. It consists of sculptures or engravings of fish (and some invertebrates) representing all the letters of the alphabet. Most of these are of geological interest, either being carved in stone, set into stone or made of man-made geological materials, such as glass, brick, steel and other metals. Here is a description of the rock types you will find if you follow the trail. Please be aware that the names of the shops mentioned in the text may change and one 'pelican crossing' has moved since the original trail was created. It is quite a long walk, but you can do it in bits, or take a break in some of the pubs on the way.

**Start point** Tourist Information Office in Queen Victoria Square TA 096 287

**Cost** Free [The Geology of the Hull Fish Trail](#)

## **LEEDS GEOLOGICAL ASSOCIATION / FRIENDS OF ROUNDHAY PARK**

[www.leedsga.org.uk](http://www.leedsga.org.uk)

Contact re Publications: William Fraser Email: [w.fraser@btinternet.com](mailto:w.fraser@btinternet.com)

### **Roundhay Park - A Walk Back in Time, 2008**

Leeds Geological Association

A 2.5 mile trail with 10 sites that illustrate changing environments at the end of Millstone Grit times as well as later tectonic events.

**Start point** Mansion House Visitors Centre SE 330 382

**Cost** £1 (plus postage) [www.leedsga.org.uk](http://www.leedsga.org.uk). Additional information: [www.forp.co.uk/geology-trail.html](http://www.forp.co.uk/geology-trail.html)

## REGION 5: EAST MIDLANDS

### BGS EARTHWISE HOLIDAY GEOLOGY GUIDES

[http://shop.bgs.ac.uk/Bookshop/category.cfm?CAT\\_ID=1C](http://shop.bgs.ac.uk/Bookshop/category.cfm?CAT_ID=1C)

#### Nottingham, Heritage in Stone

Graham Lott and John Cobbing, 1996

A laminated, folded A3 illustrated guide to the traditional building stones of Nottingham. It describes the variety of local stone used in the buildings but is not arranged as a trail.

**Start Point** Nottingham Castle SK 569 394

**Cost** £1.95

[http://shop.bgs.ac.uk/Bookshop/product.cfm?p\\_id=HS1](http://shop.bgs.ac.uk/Bookshop/product.cfm?p_id=HS1)

### GEOLOGISTS' ASSOCIATION

[www.geologistsassociation.org.uk](http://www.geologistsassociation.org.uk)

**Guides Editor: Susan Marriott**

#### GA Guide No. 26 The Peak District, 1999

F. Wolverson Cope

This is the third edition of this Guide and although there have been changes in classification etc. the general exposures are as good as they used to be. Most of the itineraries in this Guide have specific locations marked on accompanying sketch maps.

**Cost:** Members Price: £7.00, Non-Members Price: £10.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

##### **Itinerary 1 The Valley of the River Wye from Buxton to Miller's Dale**

This itinerary examines the succession of Dinantian limestones of massif facies and contemporaneous igneous rocks; to visit a number of fossil localities and to examine some important sedimentological and structural features.

**Start Point** Buxton, Car Park near railway viaduct in Spring Gardens: SK 059 735,

##### **Itinerary 2 Miller's Dale to Monsal Head**

This itinerary continues the examination of the succession of Asbian and Brigantian limestones and contemporaneous lavas and tuffs noting, in one place, the actual dying out of a lava flow; to visit several fossil localities and to examine a typical Brigantian coral band.

**Start Point** Miller's Dale, car park at former Miller's Dale Station: SK 135 733

##### **Itinerary 3 Monsal Dale and Ashford-in-the-Water**

The aim of this itinerary is to view the remarkable change in the direction of the River Wye adjacent to Monsal Head, to study a well developed coral band at Hob's House, two thin lava flows with a doleritic intrusion, and to examine the occurrence of the Ashford Black Marble.

**Start point** Monsal Dale, Parking at Monsal Head Hotel, Little Longstone: SK 185 715

##### **Itinerary 4 Castleton and Mam Tor**

This itinerary aims to study the relationship between the Dinantian limestones and the succeeding Namurian sediments and to examine the different facies of the Dinantian Stage with particular reference to their included fossils.

**Start Point** Parking at Mam Tor on the abandoned A625, now a cul-de-sac: SK 132 835

##### **Itinerary 5 Glutton Dale, Parkhouse Hill, Dowel Dale and Chrome Hill**

This itinerary examines exposures of the reef facies of the Dinantian noting the passage of standard or massif bedded limestones of Asbian (D1) age into unbedded fossiliferous reef limestones of B2 age, and study exhumed Namurian topography.

**Start Point** Parking by the Jericho Quarry cross-roads SK 0872 6732

#### **Itinerary 6 Eyam and Stony Middleton**

An itinerary studying the stratigraphy and palaeontology of the massif limestones and reef limestones in the higher Dinantian so well displayed in the cliffs and quarries of Middleton Dale and around Eyam,

**Start Point** SK 216 767 Parking in the Eyam Museum Car Park (S32 5QP)

#### **Itinerary 7 Matlock, Via Gellia and Griffie Grange**

The aim is to observe some of the main points of geological interest along the valley of the River Derwent from its confluence with the River Wye near Rowsley, through Matlock Bath to Cromford, then along the Via Gellia and the Griffie Gorge valley to Grangemill.

**Start Point** Cawdor Quarry: SK 287 605

#### **Itinerary 8 Dovedale**

This itinerary examines the relationships of the various facies of Dinantian limestones to one another, to study some of the very fossiliferous reef limestones in the valley of the River Dove, and to enjoy some of the most breathtaking scenery in Britain.

**Start Point** Thorpe Village: SK 146 508

#### **Itinerary 9 The Valley of the River Manifold**

The aim of this itinerary is to see some of the swallet holes in the bed of the River Manifold which carry the whole of the river into its underground course after a dry spell of weather; to examine the acutely folded limestones at Apes Tor near Hulme End, the impressive Thor's Cave, the spectacular reef limestone features and some of the spoil-heaps of the old Ecton Copper Mine.

**Start Point** Hartington Village: SK 128 604

#### **Itinerary 10 Mam Tor, Edale and Kinder Scout**

To study the stratigraphy and palaeontology of the Namurian rocks in the Mam Tor – Edale area and to note the relationship between these rocks and the underlying Dinantian limestones.

**Start Point** SK 132 835 Parking at Mam Tor on the abandoned A625, now a cul-de-sac.

#### **Itinerary 11 Ramshaw Rocks, the Roaches and Goldsitch Moss**

The aim is to study the relationship between structure and scenery; to examine Namurian 'grits' (sandstones) and a typical cyclotherm including a goniatite-bearing band (marine band).

**Start Point** SK 0225 6825 (*parking on the side of the road in the middle of nowhere!*)

#### **Itinerary 12 The headwaters of the River Goyt and the River Wye**

To examine the relationship between the Dinantian limestones and the overlying Namurian sandstones and shales, and to study the Namurian succession to the southwest of Buxton together with a glance at the lowest Westphalian beds in the outlier of the Goyt's Moss coalfield.

**Start Point** Burbage SK 043 723

### **GA Guide No. 56 The Castleton Area, Derbyshire 1996**

Trevor Ford

This Guide sets out to summarise both geological and geomorphological features (including caves) to be seen in a set of four day's walks around the Castleton area. The itineraries are intended to be taken on foot although some of the itineraries can be shortened by meeting transport en route. Much of the land crossed is in the care of the National Trust and much is scheduled as an SSSI. Although hammering is not allowed, much detail of the limestone lithofacies can be seen on weathered surfaces and in scree (where fossils can also be seen)

**Cost:** Members Price: £6.00, Non-Members Price: £9.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

#### **Itinerary 1 Odin Mine, Mam Tor, Windy Knoll, Treak Cliff**

The purpose of this itinerary is to gain an overview of the many interesting geological features of the Castleton area.

Walking distance: 6km approx. and ascent of about 300m. (4-6 hours)

**Start Point** Castleton village car park SK149 830

**Itinerary 2 Cowlow, Speedwell Cavern, Winnats Pass, New Rake, Peak Cavern**

The purposes of this itinerary are threefold: (1) to extend knowledge and appreciation of the Dinantian lagoon-reef basin association; (2) to consider the geomorphology of the Winnats Pass; and (3) to see something of the relationships of Peak and Speedwell Caverns to the surface features.

Walking distance: 4km approx. and ascent of about 250m.

**Start Point** Castleton village car park SK149 830

**Itinerary 3 Cave Dale, Dirlow Rake, Pindale**

The purposes of this itinerary are (1) to examine another section through the Asbian limestones of the marginal reef belt; (2) to see the character of the overlying Brigantian limestones both in Cave Dale and Pindale; (3) to observe the geomorphology of the Cave Dale dry valley; (4) to see the mineralization associated with Dirlow Rake.

Walking distance: 4km approx. and ascent of about 200m.

**Start Point** Castleton village car park SK149 830

**GA Guide No. 63 The Geology of the East Midlands, 2003**

Compiled by Albert Horton & Peter Gutteridge

A major guide to the exposures of highly significant Precambrian, Carboniferous and Permo-Triassic through to Jurassic rocks of the East Midlands. Eleven itineraries (or excursions) of variable length detail the geology of each location, such as the rock types, the palaeoenvironmental interpretation and fossil content, the structure, geomorphology and mineralization. The areas covered extend from Charnwood Forest (Precambrian) to Wirksworth, Ashover, Ecclesbourne, Alport and Holymoorside in Derbyshire (Carboniferous) to Nottingham, Vale of Belvoir and South Lincolnshire, Leicestershire and Northamptonshire (Permian-Jurassic), many illustrated with colour photographs and diagrams.

**Cost:** Members Price: £8.00, Non-Members Price: £11.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

**PART 1 The Pre-Cambrian of East Midlands**

**Itinerary 1 The Late Precambrian rocks of Bradgate Park, Charnwood Forest, Leicestershire**

Trevor D Ford

The itinerary is planned to give an overview of the complex series of outcrops of the late Pre-cambrian rocks of Charnwood Forest, together with associated extrusive and intrusive rocks.

**Start point** Bradgate Park SK 523 117. Car Park at Hunt's Hill

**Itinerary 2 The Late Pre-Cambrian Rocks of North Charnwood**

Trevor D Ford

This itinerary examines those parts of the Charnian sequence that are not covered by the Bradgate Park itinerary; it should be taken by road transport and covers about 10 km.

**Start point** Swithland Woods SK 538 130

**Itinerary 3 Pre-Cambrian Geology and Scenery of North West Charnwood**

J N Carney

To examine Pre-Cambrian rocks of the Charnian Supergroup, including Bradgate Tuff Formation and Charnwood Lodge Formation, which are divisions of the Maplewell group. The variety of volcanoclastic rock types exposed include spectacular breccias whose content of large rock fragments indicates accumulation close to the original volcanic centres.

**Start point** Calvary Rock SK 4331 1732

**Part 2 The Carboniferous of East Midlands**

**Itinerary 4 The Carboniferous Limestone around Whitworth**

Trevor D Ford

The Whitworth area provides an opportunity to study the varied sedimentology and facies changes in the Carboniferous Limestone (Asbian and Brigantian). The unconformable cover of Millstone Grit (Namurian) strata, the effects of faulting, mineral veins and mining relics combine to make a highly instructive itinerary.

**Start point** Black Rocks car park (top level) SK 291 557

**Itinerary 5 Carboniferous Rocks and Mineralization of the Ashover Anticline**

Ian D Sutton

This itinerary will enable participants to gain an understanding of the Dinantian Limestone and volcanoclastic sedimentary sequence in the core of the Ashover Anticline. It will also give the opportunity of studying the Namurian, wholly argillaceous Edale Shales and succeeding sandstone sequence overlying the Dinantian sequence. Additionally the relationship between the topography and underlying geology should become apparent in the area that is an excellent venue to attempt geological mapping exercises. Mineralization and historical mining aspects can also be recognized.

**Start point** Ashover village SK 352 633. Large car park available at Parish Hall.

#### **Itinerary 6 The Edale Shales and Ashover Grit of the Ecclesbourne Valley and Allport Hill**

Neil Aitkenhead and Ian Chisholm

The purpose of this itinerary is firstly to examine selected rocks in the Edale shales, some characteristic and some unusual; and secondly, to study the contrasting fluvial and delta slope sandstones of the Ashover Grit.

**Start point** 130 m from the Bridge on the B5023 as it crosses the river SK 3137 4555

#### **Itinerary 7 The Upper Carboniferous Sequence near Holymoorside, South West of Chesterfield**

John Marriott

This itinerary examines the geology of the Carboniferous Lower Coal Measures. In particular it will focus on how different lithologies of deltaic cyclothems have shaped the landscape and given rise to the traditional industries of the area.

**Start point** Holymoorside SK 338 694. Cars may be parked in the Village Hall car park.

### **PART 3 The Permian to Middle Jurassic Geological History of the East Midlands**

#### **Itinerary 8 The Permo-Trias of North Nottinghamshire**

R. Toynton

This itinerary examines the Permo-Triassic rocks in north Nottinghamshire and demonstrates the nature of the stratigraphic succession. Variations within this succession between the North and South of the area can be shown, as can the way in which evidence given by the rocks, in the absence of fossils, can be used to interpret the palaeoenvironmental conditions.

**Start point** The Visitors Centre, Cresswell Craggs SK 538 744

#### **Itinerary 9 The Permo-Triassic Rocks of Nottingham**

Andy Howard

This itinerary demonstrates the various Permian and Triassic sedimentary rocks exposed in the Nottingham area and describes their stratigraphy and environments of deposition.

**Start point** Locality 1 Bulwell Quarry SK 5530 4542 (Localities are widely separated and best treated as individual mini-itineraries allowing 1-2 hours for each site.)

#### **Itinerary 10 Liasic of the Vale of Belvoir**

Alan Brandon

This itinerary examines the stratigraphy and geomorphology of the Lower Jurassic strata in the Vale of Belvoir. Firstly, it provides a down-dip transect through the stratigraphy of the Scunthrope and Brant Mudstone Formations of the Lower Jurassic Lias Group. Secondly, the walk provides an opportunity to relate the Lias stratigraphy to the geomorphology of the Vale. (Walk of approx. 8 km)

**Start point** Rhaetic escarpment at Sutton SK 7593 3725

#### **Itinerary 11 Middle Jurassic of South Lincolnshire, Leicestershire and Northamptonshire.**

Alan Dawn

To examine sequences in the Middle Jurassic, which provide an opportunity to compare sediments deposited in marine and non-marine environments. This itinerary is split into 2 and covers a total of 11 sites of interest.

**Start point 11a** Greatham Quarry SK 931 145

**Start point 11b** Duddington Quarry SK 995 013

## **LEICESTER LITERARY AND PHILOSOPHICAL SOCIETY GEOLOGY SECTION**

[www.charnia.org.uk](http://www.charnia.org.uk)

Contact re Publications: Dr Joanne Norris Email: [j.e.norris@ntlworld.com](mailto:j.e.norris@ntlworld.com)

**Building Stones of Leicester ... a guided walk, 2006**

J. H. McD. Whitaker

Published by the East Midlands Geological Society.

The guide is divided into 3 areas or walks covering the eastern precinct, the civic centre and the Roman and Medieval Leicester.

**Start point** Leicester Railway Station

**Cost** £4.00 + p&p via [www.charnia.org.uk](http://www.charnia.org.uk)



## REGION 6: EASTERN ENGLAND

### ESSEX ROCK & MINERAL SOCIETY

[www.erms.org](http://www.erms.org)

Brentwood Rock – Building Stone Trail, 1997

**Gerald Lucy**

**There are at least 18 different types of rocks visible in the High Street, and probably many more. Each one formed under different conditions at different times in the Earth's history.**

**Start point** The War Memorial, Middleton Hall Lane, Brentford

**Cost** Free Available as pdf from [www.geoessex.org.uk](http://www.geoessex.org.uk)

### GEOESSEX

[www.geoessex.org.uk](http://www.geoessex.org.uk)

The Chalk Walk: Chafford Gorges Geotrail No. 1, 2010

**This trail guide describes a walk through the disused chalk pits of the Chafford Gorges Nature Trail.**

**Start point** Chafford Gorges Visitor Centre, Drake Road, Chafford Hundred, Grays, Thurrock, Essex RM16 6RG. TQ 588 793

**Cost** £1 available at the Visitor Centre [www.essexwt.org.uk/reserves/chafford-gorges](http://www.essexwt.org.uk/reserves/chafford-gorges)

### Colchester Town Geology Trail, 2000 (Colchester Natural History Museum)

Exploring geology down the High Street in Colchester.

**Start point** Colchester Museum, High Street (corner with Queen Street) TL 999 252

**Cost** Free Available as pdf from [www.geoessex.org.uk](http://www.geoessex.org.uk)

### Rayleigh High Street Geological Trail, 1997

Trevor Greensmith

A geological trail down Rayleigh High Street

**Start point** Holy Trinity Church (north end of the High Street) TQ 808 909

**Cost** Free Available as pdf from [www.geoessex.org.uk](http://www.geoessex.org.uk)

### HERTFORDSHIRE GEOLOGICAL SOCIETY

[www.hertsgeolsoc.ology.org.uk](http://www.hertsgeolsoc.ology.org.uk)

Contact re Publications: Email [lesley.exton@gmail.com](mailto:lesley.exton@gmail.com)

### St Albans: geological trail around St Michaels (revised)

Dr Haydon Bailey

**Start point** Verulamium Museum TL 136 074

**Cost** Free Available as pdf from [www.hertsgeolsoc.ology.org.uk](http://www.hertsgeolsoc.ology.org.uk)

## NAZEMAN EDUCATIONAL TRUST

[www.nazeman.co.uk](http://www.nazeman.co.uk)

### **The Naze and its Geology**

CD & Booklet describing the geology

**Start point** Car Park at Walton-on-the-Naze TM 264 234

**Cost** £5.50 from [www.nazeman.co.uk/#/shop/4575511801](http://www.nazeman.co.uk/#/shop/4575511801)

### **An illustrated guide to the fossils of the Naze**

Mike Todd & Sue Cranstone, 2007

Both the London Clay and Red Crag fossils are illustrated in 2 volumes with indication as to the rarity. Volume 2 also contains Pleistocene fossils and artefacts.

**Start point** Car Park at Walton-on-the-Naze TM 264 234

**Cost** Vol. 1 £5, Vol. 2 £4 from [www.nazeman.co.uk/#/shop/4575511801](http://www.nazeman.co.uk/#/shop/4575511801)

## **NORFOLK GEODIVERSITY PARTNERSHIP**

<https://sites.google.com/site/norfolkgeodiversity/>

Contact re Publications: Tim Holt-Wilson Email [timholtwilson@onetel.com](mailto:timholtwilson@onetel.com)

### **Mousehold Heath Earth Heritage Trail**

Tim Holt-Wilson

The Mousehold Heath Earth Heritage Trail introduces the geological history of the Heath, and its links with biodiversity, archaeology and industrial history.

**Start point** the trail has 18 points of interest which may be sought out in any order. A convenient car park is at TG 244 101.

**Cost** free on:

[www.norwich.gov.uk/Environment/ParksAndOpenSpaces/WoodlandsHeathsAndMarshes/MouseholdHeathTrail/Pages/default.aspx](http://www.norwich.gov.uk/Environment/ParksAndOpenSpaces/WoodlandsHeathsAndMarshes/MouseholdHeathTrail/Pages/default.aspx)

# REGION 7: LONDON

GEOLOGISTS' ASSOCIATION

[www.geologistsassociation.org.uk](http://www.geologistsassociation.org.uk)

**Guides Editor: Susan Marriott**

GA Guide No. 68: The Geology of London

## **Available in book format (2012) or as pdfs of individual itineraries (2014)**

Compiled by Diana Clements

The Guide to the Geology of London has chosen ten Itineraries from within the M25 to provide snapshots of the rocks underlying London. It aims to cover all the rock types that outcrop within the area. It describes several SSSIs including Harefield, Charlton, Abbey Wood, and Quaternary sites in east London. It is a multi-authored guide drawing on the best authority for the locations chosen.

**Cost of book:** £17 (members £14): [www.geologistsassociation.org.uk/guide\\_68\\_London.html](http://www.geologistsassociation.org.uk/guide_68_London.html)

**Cost of pdfs of individual itineraries:** £2 (Members £1.60); Itinerary 2 & 4 £1.50 (Members £1.20): [www.geologistsassociation.org.uk/londownload.html](http://www.geologistsassociation.org.uk/londownload.html)

### **Introduction**

*Rory Mortimore (Overview and Chalk), Danielle Schreve (post-Anglian Pleistocene Gravels), additional material compiled by Diana Clements*

### **Free to download**

#### **Itinerary 1 The Colne Valley**

*Bryan Cozens (overview and Quaternary), Steve Tracey (Lambeth Group and Harwich Formation), Christopher Wood (Chalk), Diana Clements (Northmoor Hill)*

This itinerary examines the Cretaceous/Tertiary boundary at Harefield SSSI (limited access) and the overlying Upnor, Reading and Harwich Formations. The itinerary includes chalk quarries along the River Colne and a discussion on the Pleistocene gravels.

**Start point** Harefield Great Pit TQ 051 897

#### **Itinerary 2 Pinner Chalk Mines**

*Ramues Gallois (Chalk), Jackie Skipper (Tertiary and Hertfordshire Puddingstone), compiled by Diana Clements with contributions from the publications by Ramues Gallois and Ken Kirkman*

The Pinner Chalk Mines are not currently accessible but because of their importance they have been included in the Guide. The itinerary examines the historic Cretaceous Chalk Mines including an exposure of the rare example of Hertfordshire Puddingstone *in situ* in the mine shaft.

**Location** Dingles Chalk Mine TQ 115 905

#### **Itinerary 3 The geology of London from Hampstead Heath**

*Diana Clements*

This itinerary is in the form of a 3-mile circular geotrail intended to give an overview of the geology of London from the vantage point of Hampstead Heath and to look for clues to the rock types underfoot. Past quarrying for sand and clay is investigated, along with the need for water for London..

**Start point** Whitestone Pond TQ 262 863

#### **Itinerary 4 A geological walk around Trent Park**

*Diana Clements, Norman Coles*

The circular geotrail detailed around Trent Park looks for evidence for the Anglian glaciations that reached as far as London about 450,000 years ago. The walk is about 3 miles long and crosses deep valleys cut into the London Clay and also ridges of pre-Anglian Dollis Hill Gravel capped by glacial till.

**Start point** Cockfosters Road Car Park within Trent Park TQ 281 969

#### **Itinerary 5. Disused Chalk pits and overlying Thames Gravels in East London**

*Danielle Schreve (Quaternary), Christopher Wood (Chalk), compiled by Diana Clements with contributions from Gerald Lucy (Chafford Hundred geotrail) and Peter Allen (periglacial features)*

This itinerary is included in the Guide primarily for its contribution to the Quaternary geology of the lower

reaches of the Thames which is described in some detail. The area is changing fast with developments in the old chalk pits, but accessible sections of chalk and Thanet Sand still remain.

**Start point** Greenlands Pit (restricted access) TQ 568 786

#### **Itinerary 6 Charlton, Plumstead and Abbey Wood**

*Jackie Skipper (Charlton), Christopher Wood (Chalk), Jerry Hooker (Abbey Wood), Luke Martin (historical notes and Plumstead locations)*

The SSSI at Gilbert's Pit, Charlton is the best remaining section of Lambeth Group and Blackheath Beds in the London area and is therefore well worth visiting although access is currently limited. It is the type section for the Woolwich Formation. The SSSI at Abbey Wood is famous for the mammal fauna from the Lessness Shell Bed within the Blackheath Beds. Small exposures at Plumstead are included. **Start point** Charlton Valley Grove TQ 4125 7830

#### **Itinerary 7 Chislehurst Caves, Elmstead Woods and Sundridge Park**

*Christopher Wood (Chalk of Chislehurst Caves), John Cooper (History of Chislehurst Caves and Elmstead Wood field descriptions), Diana Clements (Sundridge Park)*

Chislehurst Caves allows examination of Seaford Chalk and the overlying Bullhead Bed of the Thanet Sand Formation. The itinerary includes the SSSI relating to the Blackheath Member of the Harwich Formation at Elmstead 'Rock Pit'. An example of a Pulhamite 'rock face' can be seen in the grounds of Sundridge Park Manor.

**Start point** Chislehurst Caves TQ 431 696

#### **Itinerary 8 The 'Geological Illustrations' of Crystal Palace Park**

*Peter Doyle*

Crystal Palace Park in the London Borough of Bromley is a masterpiece of park design by the visionary Sir Joseph Paxton. Created to house the iron and glass 'Crystal Palace', the park was developed on a series of themed terraces, with the Palace itself at the top of Sydenham Hill. Although the Palace was destroyed by fire in 1936, Paxton's original 'antediluvian monsters' and geological cliffs survive.

**Start point** TQ 344 705

#### **Itinerary 9 Riddlesdown Chalk Quarry (formerly Rose & Crown) and Croham Hurst near Croydon**

*Rory Mortimore (Chalk of Riddlesdown), Paul Sowan, (industrial archaeology of Riddlesdown; Croham Hurst)*

The Riddlesdown Chalk Quarry ceased working in the 1960s but has avoided the fate of most quarries of landfill or development and so it is currently the best location to examine Chalk in the London Area. The Quarry is managed by the City of London Corporation and access is via them. Croham Hurst, less than 4 miles away at Breakneck Hill, is public open space. Small exposures of ferruginous cemented pebbles of the Harwich Formation can be seen at the top of the hill.

**Start point** Riddlesdown Quarry (with City of London rangers) TQ 338 594

#### **Itinerary 10 The Thames**

*Diana Clements*

This itinerary highlights the importance of the Thames in relation to the Geology of London. Geological walks can be taken along the foreshore at low tide, particularly on the South Bank in Central London where remnants of a submerged forest can be seen as well as Erith further downstream. London Clay can sometimes be seen at very low tide in the Hammersmith-Richmond area.

**Start point** Festival Pier TQ 307 803

### **LONDON GEODIVERSITY PARTNERSHIP**

[www.londongeopartnership.org.uk/geotrails.html](http://www.londongeopartnership.org.uk/geotrails.html)

#### **Green Chain Walk Geotrail, 2012**

A 7 mile walk along the Green Chain Walk from the Thames Barrier to Lesnes Abbey, which includes 12 geologically interesting stopping points that illustrate London's geological past of tropical seas and nearby glaciers.

**Start point** Thames Barrier, Woolwich TQ 417 793

**Cost** free downloadable pdf from [www.londongeopartnership.org.uk/gcgeotrail.html](http://www.londongeopartnership.org.uk/gcgeotrail.html)

#### **A Trail Through Time, 2016**

The Green Chain has some remarkable geological sites that reveal how this landscape evolved millennia ago. We've highlighted for your convenience 12 of the best below - from submerged forests and fossil beds with sharks teeth to spring wells fit for a king!

Each feature is also included in a fascinating audio trail. Starting conveniently at a nearby train station, the 12 mini 'Time Trails' bring to life the massive forces of nature that created them, and their importance in shaping economic activity and the lives of everyday people.

After completing the mini-trail, you can either retrace your steps back to the station or continue along the sign-posted Green Chain Walk for further explorations.

**Start point** Erith Station TQ 511 781

**Cost** free audio available at [http://www.greenchain.com/greenchainsite/info/13/time\\_trails](http://www.greenchain.com/greenchainsite/info/13/time_trails)

### **Thames Path Geotrail**

Designed by South London RIGS group, the path starts at the Thames Barrier Information Centre and follows the Thames path national trail, with a short deviation on the Greenwich Peninsula, for 6 miles ending in Rotherhithe. For more details of the route and detailed descriptions of the stops see:

**Start point** Thames Barrier, Woolwich TQ 417 793

**Cost** free downloadable pdf from [www.londongeopartnership.org.uk/gcgeotrail.html](http://www.londongeopartnership.org.uk/gcgeotrail.html)

### **Crystal Palace Park – the ‘Geological Illustrations’, 2012**

An audio trail is now available which is downloadable from the website below. It was created by Dan Boys Audio Trails from an initiative by Alister Hayes, London Borough of Bromley and explains the ‘Geological Instructions’ with the help of actors.

**Start Point** within the Victorian theme park TQ 344 705

A map is available on the website: [www.audiotrails.co.uk/dinosaurs](http://www.audiotrails.co.uk/dinosaurs)

### **Urban Geology (see also separate entry below)**

A series of Building Stone walks devised by Dr Ruth Siddall of University College London, based on her knowledge of marbles, the quarries they came from and with information from her former colleague, Eric Robinson. They are free to download from her website:

[www.ucl.ac.uk/~ucfbrxs/Homepage/UrbanGeology.htm](http://www.ucl.ac.uk/~ucfbrxs/Homepage/UrbanGeology.htm)

### **UNIVERSITY COLLEGE, LONDON – URBAN GEOLOGY**

[www.ucl.ac.uk/~ucfbrxs/Homepage/UrbanGeology.htm](http://www.ucl.ac.uk/~ucfbrxs/Homepage/UrbanGeology.htm)

Dr Ruth Siddall [r.siddall@ucl.ac.uk](mailto:r.siddall@ucl.ac.uk)

A series of Building Stone walks devised by Dr Ruth Siddall of University College London, based on her knowledge of marbles, the quarries they came from and with information from her former colleague, Eric Robinson. They are free to download from her website and are constantly added to and updated:

- [1. UCL & the University of London](#)
- [2. Tottenham Court Road](#)
- [3. Two Buildings at The Angel, Islington](#)
- [4. Hyde Park Corner](#)
- [5. St Pancras New Church](#)
- [6. Gresham Street & the Guildhall](#)
- [7. The Russell Hotel](#)
- [8. Queenhithe](#)
- [9. Regent's Place, West Euston](#)
- [10. Victoria Street](#)
- [11. Piccadilly](#)
- [12. St Paul's Churchyard](#)
- [13. Cigala Restaurant, Lamb's Conduit Street](#)
- [14. Church's Shoe Shop, Regent's Street](#)
- [15. Lamb's Conduit Street](#)
- [16. Luxury Lithics on Bond Street](#)
- [17. Waterloo & City](#)
- [18. Urban Geology in Fitzrovia](#)
- [19. Memorial to the Siege of Malta](#)
- [20. London's Pub Geology](#)
- [21. Granites of the Victoria Embankment](#)
- [22. Westminster Abbey Sanctuary Pavement](#)
- [23. The Stones of London's War Memorials](#)

- [24. Irongate House](#)
- [25. The Ivy Restaurant](#)
- [26. Egyptian Geology in the British Museum](#)
- [27. Euston Station](#)
- [28. The Brompton Oratory](#)
- [29. Portland Stone in St James's](#)
- [30. Fossils in the Portland Stone](#)
- [31. St Martin's Lane & Shaftesbury Avenue](#)
- [32. Building Stones at Canary Wharf](#)
- [33. Building Stones around Sloane Square](#)
- [34. Decorative Stone in the Natural History Museum](#)

Details of the stones of Individual buildings can be located on the interactive map:  
<http://londonpavementgeology.co.uk/>

## REGION 8: SOUTH EAST

### BERKSHIRE GEOCONSERVATION GROUP

[www.berksgeoconservation.org.uk](http://www.berksgeoconservation.org.uk)

Contact re Publications: Lesley Dunlop Email: [info@berksgeoconservation.org.uk](mailto:info@berksgeoconservation.org.uk)

#### **Around the 3 Valleys: an exploration of the geology, landscape and history on the Lambourn, Kennet and Pang valleys in West Berkshire, 2011**

Lesley Dunlop & Dick Greenaway, illustrated by Dorcas Ward

ISBN-10: 0954359739; ISBN-13: 978-0954359737

17 detailed itineraries, well illustrated with maps.

**Cost** £7 (plus £1.50 p&p if posted) from website: [www.berksgeoconservation.org.uk/reports.php](http://www.berksgeoconservation.org.uk/reports.php)

##### **Itinerary 1 Downs with Barrows**

The Seven Barrows & the Hangman's Stone. A walk around Lambourn Parish, starting and finishing at Lambourn Seven Barrows Nature Reserve (about 3.5 miles/5.5km)

**Start Point** Seven Barrows Nature Reserve SU 330 816

##### **Itinerary 2 Stones & Horses**

The landscape around Lambourn Town (about 5 miles/8km)

**Start Point** Lambourn church SU 330 790

##### **Itinerary 3 Mills, Mounts & Water Meadows**

A walk from Bagnor to Boxford and back (about 4.5 miles/7.5km)

**Start Point** Manor Road, Bagnor (near Watermill Theatre) SU 451 694

##### **Itinerary 4 Castle, Marshes & Heath**

A walk around Donnington, Bagnor and Snelsmore Common (about 4.75 miles/7km)

**Start Point** Donnington Castle, Newbury SU 462 693

##### **Itinerary 5 Above & Below Hungerford**

The countryside around the Hungerford countryside (about 7 miles/11km)

**Start Point** Car park off Hungerford Road (near Dun Mill Lock) SU 351 678

##### **Itinerary 6 Above & Below Kintbury**

The countryside around Kintbury and Inkpen Common (about 5 miles/8km)

**Start Point** Kintbury Wharf SU 385 674

##### **Itinerary 7 Slips, Sloughs & Swallow Holes**

The countryside around Curridge (about 4 miles/6km)

**Start Point** Car park at Curridge Primary School SU 491 715

##### **Itinerary 8 Pits & Hills**

The countryside around Woolhampton, Brimpton and Wasing (about 7 miles/11km)

**Start Point** Rowbarge public house car park, Woolhampton Bridge SU 57222 66446

##### **Itinerary 9 Mills, Hills & History**

The countryside around Padworth and Ufton Court (about 6 miles/10km)

**Start Point** Aldermaston Lock SU 602 672

##### **Itinerary 10 Above & Below Compton**

A walk over the downs north of Compton (about 6 miles/10km)

**Start Point** Compton Village car park SU 520 798

##### **Itinerary 11 Bombers, Giants & Banks**

The countryside between Ashampstead and Aldworth (about 5.5 miles/9km)

**Start Point** Church Lane, Ashampstead SU 564 767

##### **Itinerary 12 Above & Below Hampstead Norreys**

The countryside east and south of Hampstead Norreys (about 6 miles/9km)

**Start Point** Hampstead Norreys Village Hall SU 526 764

### **Itinerary 13 A Look at the Far East**

A walk around the eastern part of Hermitage Parish (about 4 miles/6km)

**Start Point:** Yatterdon Road, near Windmill Farm SU 519 737

### **Itinerary 14 Swallow Holes & Devil's Steps**

A closer look at the geological sites in Bucklebury Parish (about 3.5 miles/5.5km)

**Start Point** The Pot Kiln public house SU 552 730

### **Itinerary 15 Down the Pang**

The valley between Rushall Manor Farm and Bradfield (about 5 miles/8km)

**Start Point** Rushall Manor Farm SU 584 723

### **Itinerary 16 Above & Below the Sulham Gap**

A walk through Pangbourne, Tidmarsh and Sulham Parishes (about 6.5 miles/10.5km)

**Start Point** Pangbourne railway station SU 632 767

## **Geological Sites to Visit in Berkshire, 2011**

Berkshire Geoconservation Group

A brief guide to 14 geological sites you can visit in Berkshire.

**Cost** free to download; £1 printed copy from: [www.berksgeoconservation.org.uk/reports.php](http://www.berksgeoconservation.org.uk/reports.php)

### **Itinerary 1 Cookham Dean Chalk Pit**

A good example of the Upper or White Chalk, including a Seaford Nodular Chalk horizon (also known as Lewes Chalk).

**Start Point** Grubwood Lane, Cookham SU 869 854

### **Itinerary 2 Hurley Chalk Pit**

Seaford or Lewis Nodular Chalk, with large tabular flints.

**Start Point** Bridle way north from Warren Row or south from A4130 SU 813 819

### **Itinerary 3 Wargrave Chalk Pit**

Seaford or Lewis Nodular Chalk, with fossils (echinoids, bivalves and crinoids) and thin layers and infills of Palaeogene sediments

**Start Point** Braybrooke Road, Wargrave (small car park) SU 7880 7829

### **Itinerary 4 Snelsmore Common**

The site offers an excellent opportunity to see landscape features associated with stratigraphy.

**Start Point** Car park off B4494, Snelsmore Common Country Park SU 46206 71056

### **Itinerary 5 Chapel Farm Sarsens**

A small group of unworked Sarsen stones, showing rootlet holes and undulating surfaces

**Start Point** Chapel Farm on road between B4494 and Hill Green SU 453 758

### **Itinerary 6 Rushall Farm Chalk Pit**

Unconformity between the Upper Cretaceous Chalk and the overlying Palaeogene beds

**Start Point** Rushall Farm SU 588 726

### **Itinerary 7 The Coombes**

Boundary between the Palaeogene London Clay and the Bagshot formation (sands and gravels)

**Start Point** Coombes Lane off Bearwood Road, Barkham SU 78278 67835

### **Itinerary 8 Lynch Wood Springs, Lambourn**

The spring-fed ponds within Lynch Wood are the source of the River Lambourn

**Start Point** Goose Green, Lambourn SU 32766 79158

### **Itinerary 9 Radley Bottom**

A typical dry valley in the chalk

**Start Point** Radley Bottom Road, SW of Hungerford Newton SU 3649 7070

### **Itinerary 10 Winter Hill**

From the Winter Hill viewpoint, river terraces are clearly seen as steps on the hillside north of the river Thames.

**Start Point** Stonehouse Lane, off Winter Hill road SU 8736 8635

### **Itinerary 11 Quarry Wood, Bisham**

Pebbles from one of the older Thames river terraces – the Gerrards Cross gravels.

**Start Point:** Grubwood Lane, Cookham Dean SU 8642 8532

### **Itinerary 12 Wokingham Iron-Rich Streams**



Naturally occurring iron-rich streams emerging onto impervious Londond clays, having percolated through the iron-rich bagshot sands and clays.

**Start Point** Rocks Nest Country Park (car park), Barkham Ride, Barkham SU 78869 65817

**Itinerary 13 Goring Gap**

Excellent views of the Goring Gap, where the River Thames passes through the chalk escarpment.

**Start Point** Lough Down / Lardon Chase, Streartey SU 5880812

**Itinerary 14 Warfield Church**

Building stones – walls of iron cemented conglomerate; tower includes sarsen stones and Jurassic limestone; Saxon window frames are chalk, later one Jurassic limestone

**Start Point** Warfield Church, Church Lane, Warfield SU 88004 72210

**Reading Town Centre Walk, 2012** Berkshire Geoconservation Group

A leaflet produced to accompany a guided walk around Reading Centre looking at the building materials used from medieval times to the present day. No map.

**Start point** Town Hall, Reading SU 71664 73576

**Cost** free to download from: [www.berksgeoconservation.org.uk/reports.php](http://www.berksgeoconservation.org.uk/reports.php)

**Newbury – a town centre building stones walk** Berkshire Geoconservation Group

The walk begins at the West Berkshire Museum and finishes at Market Place. Twelve points of geological interest are described and indicated on a sketch map.

**Start point** West Berkshire Museum, Newbury SU 47231 67138

**Cost** free to download from: [www.berksgeoconservation.org.uk/reports.php](http://www.berksgeoconservation.org.uk/reports.php)

**Chalk Hills & Landscape around East Garston** Berkshire Geoconservation Group

Easy 4.5mile (7.2km) walk with 8 points of interest and detailed map.

**Start point** East Garston Village community shop SU 36430 76751

**Cost** free to download from: [www.berksgeoconservation.org.uk/reports.php](http://www.berksgeoconservation.org.uk/reports.php)

**The geology of the area around Greenham Common** Berkshire Geoconservation Group

The geology of Greenham Common, Cockham Common and Bowdown Wood. An OS map extract shows where to park for a circular walk around the area.

**Start point** Control Tower car park, Greenham Common SU 49954 65176

**Cost** free to download from: [www.berksgeoconservation.org.uk/reports.php](http://www.berksgeoconservation.org.uk/reports.php)

**The geology of the area around Woolhampton & Brimpton** Berkshire Geoconservation Group

A story of river flow and floodplains of the River Kennet. An OS map extract shows where to park in Woolhampton for a circular walk including the Kennet and Avon canal.

**Start point** Car park beside the canal in Woolhampton SU 57255 66498

**Cost** free to download from: [www.berksgeoconservation.org.uk/reports.php](http://www.berksgeoconservation.org.uk/reports.php)

**The Geology of the Newtown Road Cemetery, Newbury, 2010** Berkshire Geoconservation Group

An illustrated report giving a brief history of the cemetery, its underlying geology and types of rock used as gravestones.

**Start point** Newton Road Cemetery, Newbury SU 47031 66158

**Cost** free to download from: [www.berksgeoconservation.org.uk/reports.php](http://www.berksgeoconservation.org.uk/reports.php)

**BUCKINGHAMSHIRE EARTH HERITAGE GROUP**

[www.bucksgeology.org.uk/index.html](http://www.bucksgeology.org.uk/index.html)

Contact re Publications: Mike Palmer Email: [mpalmer@buckscountymuseum.org](mailto:mpalmer@buckscountymuseum.org)

**Whiteleaf Nature Reserve, 2011**

Buckinghamshire Earth Heritage Group

The geological interest lies in the demonstration of how geology controls landscape - in this case the typical Chilterns landscape of dip and scarp slopes, and vale.

**Start point** Whiteleaf Hill car park SU 8215 0370.  
**Cost** Free <http://www.bucksgeology.org.uk/whiteleaf.html>

### **Coombs Quarry, 2012**

Buckinghamshire Earth Heritage Group

An excellent site with a blend of archaeological, geological and botanical interest, geology covers Jurassic Blisworth Limestone, Blisworth Clay and Cornbrash.

**Start point** Thornborough Bridge picnic site car park, off A421 SP 731 332

**Cost** Free [www.bucksgeology.org.uk/coombs\\_quarry.html](http://www.bucksgeology.org.uk/coombs_quarry.html)

### **Ivinghoe Beacon, 2011**

Buckinghamshire Earth Heritage Group

This is a beautiful location on Chalk hills offering spectacular views of the vale and of dry valleys.

**Start point** Beacon Hill National Trust car park, signed from B488 SP 954 149

**Cost** Free [www.bucksgeology.org.uk/ivinghoe\\_beacon.html](http://www.bucksgeology.org.uk/ivinghoe_beacon.html)

### **Northmoor Hill, 2011**

Buckinghamshire Earth Heritage Group

A circular walk around a site showing how geology controls habitats.

**Start point** Northmoor Nature Reserve car park TQ 034 891.

**Cost** Free [www.bucksgeology.org.uk/northmoor\\_hill.html](http://www.bucksgeology.org.uk/northmoor_hill.html)

### **Burnham Beeches, 2011**

Buckinghamshire Earth Heritage Group

The geology of the site consists of several Quaternary gravel terraces with two small streams that disappear into sinkholes.

**Start point** Burnham Beeches main car park SU 953 850

**Cost** Free [www.bucksgeology.org.uk/burnham\\_beeches.html](http://www.bucksgeology.org.uk/burnham_beeches.html)

## **GEOCONSERVATION KENT**

[www.kentrigs.org.uk](http://www.kentrigs.org.uk)

3 booklets by Geoff Downer available via the website

### **Geology of Reculver Country Park, 2011**

This illustrated booklet describes the geology of the Reculver Country Park, a classic coastal section on the north Kent coast. The sedimentary beds exposed in the cliffs are detailed together with the local 'drift' deposits. The landscape of the Country Park is explained with the silting of the Wantsum Channel to the east, marine erosion to the north and the impact of numerous historical landslips on the coastline. The booklet includes a circular walk for the geological beginner from Reculver to Bishopstone Glen and back highlighting many of the geological and landscape features to be seen.

**Start point** Car park at Reculver TR 2265 6926

**Cost** £4.50 inc p&p: [www.kentrigs.org.uk/index.php?option=com\\_content&view=article&id=16&Itemid=22](http://www.kentrigs.org.uk/index.php?option=com_content&view=article&id=16&Itemid=22)

### **Stones of Reculver country Park, 2011 (£4.50 inc p&p)**

This well illustrated booklet describes the building stones used in the two nationally important scheduled monuments at Reculver: the wall of the Roman Fort of Regulbium and the remains of St Mary's Church. The booklet includes a walk along the surviving perimeter wall of the Roman fort identifying the various stones you can see as well as some of the building techniques employed. Finally there is a review of the historical background on the coastal defences and an illustrated survey of the principal stones to be found in the sea defences in the Country Park.

**Start point** Car park at Reculver TR 2265 6926

**Cost** £4.50 inc p&p: [www.kentrigs.org.uk/index.php?option=com\\_content&view=article&id=16&Itemid=22](http://www.kentrigs.org.uk/index.php?option=com_content&view=article&id=16&Itemid=22)

### **The Stones of St Augustine's Abbey Canterbury, 2009**

This profusely illustrated booklet details the building stones used in the construction of the St Augustine's Abbey in Canterbury. The abbey site provides an unparalleled range of medieval building materials both representative of those commonly used in East Kent and accessible to the public. The booklet includes numerous photographs, maps and a plan of the site showing the location of the stones illustrated.

**Start point** St. Augustine's Abbey TR 160 580

**Cost** £3.95 inc p&p: [www.kentrigs.org.uk/index.php?option=com\\_content&view=article&id=16&Itemid=22](http://www.kentrigs.org.uk/index.php?option=com_content&view=article&id=16&Itemid=22)

## **GEOLOGISTS' ASSOCIATION**

[www.geologistsassociation.org.uk](http://www.geologistsassociation.org.uk)

**Guides Editor: Susan Marriott**

### **GA Guide No. 55 Early Cretaceous environments of the Weald, 1996**

Alastair Ruffell, Andrew Ross & Kevin Taylor

In order for the Guide not to become out-of-date it concentrates on exposures that are likely to remain in their present state for some time, thus some abandoned sites are omitted. The interested geologist will find the locations easily, observe the main features with no trouble, and be able to do this for some years to come.

**Cost:** Members Price: £9.00, Non-Members Price: £12.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

#### **Itinerary 1 The Hastings Group in the core of the Weald**

Five different stops give insight to points of geological interest which are the junction of Lower Tunbridge Wells Sand and Grinstead Clay, the Lower Tunbridge Wells Pebble Bed, the Ardingly Sandstone, succession in the Wadhurst clay, palaeosols, plant fossils, non-marine bivalves, and siderite concretions.

**Start Point** Philpots Quarry TQ 355 322

#### **Itinerary 2 Coastal sections around Hastings**

Three stops reveal fluvial channel sandstones, palaeosols, bone-beds, siderite and sphaerosiderite concretions, saurian footprints, faults, fossil plants, old sea-cliffs, Ashdown Formation/Wadhurst Clay junction, Cliff End sandstone, Tunbridge Wells Sand, and Weald Clay.

**Start Point** Eastern Coastal Outcrop – Cliff End, TQ 8890 1327

#### **Itinerary 3 The Weald Clay of the Weald**

Three stops feature the Upper and Lower Weald Clay, Clockhouse Sandstone, Large '*Paludina*' Limestone, gastropods, ostracods, conchostracans, insects, fish, sharks, and conifer twigs.

**Start Point** Clockhouse Brickworks TQ 173 386

#### **Itinerary 4 Folkestone**

Three stops take you to see rotational slumps; rag and hassock, ammonites, the Hythe and Folkestone Formation type locations, the junction between them and associated exotic conglomerate or 'unconformity facies', junction between Folkestone Formation and the Gault, phosphate nodule beds and abundant fossils.

**Start Point** Sandgate Foreshore TR 194 348

#### **Itinerary 5 The South Downs**

Eleven major stops (and more minor stops) highlight basal Chalk succession, Upper Greensand, the Hythe Formation, early diagenesis and coarsening-up cyclicity, Sandgate Formation and its junction with the Hythe Formation, smectite clays, Folkestone-Gault junction, Iron Grit, Lower Greensand, Park Lane fossiliferous location, junction of Pulborough Sandrock and Marehill Clay, bivalve fossils, silica and carbonate diagenesis, Fuller's Earth, shallow marine sedimentary structures, tabular cross-stratification, vertical trace fossils, and clay drapes.

**Start Point** Cow Gap TV 5955 9563

#### **Itinerary 6 The core of the Weald Anticline around Petersfield**

Constant travel between roadside points builds up a knowledge of the Cretaceous succession; viewable are: the Sandgate Formation, Pulborough Sandrock (fossiliferous), Folkestone Formation (marine sands), iron/carstone, Selham Ironshot Sands, and the Hythe Formation.

**Start Point** Habin River Bridge SU 808 229

#### **Itinerary 7 Haslemere to Godalming**

Four locations investigate facies changes from the core of the Weald anticline to Lower Greensand Group: Hythe and Sandgate Formations, Bargate (Beds) Member, fossils and cross-stratification, chert cementation, glauconitic sands, burrow traces.

**Start Point** Devil's Punch Bowl SU 9000 3580

#### **Itinerary 8 The Hog's Back (Farnham to Dorking)**

Three stops showcase Gault-Folkestone Formation junction, Folkestone clay beds, sandwave sedimentology, silica and carbonate cemented Hythe Formation, and Hythe-Sandgate contact.

**Start Point** Mear's Pit SU 865 476

#### **Itinerary 9 Albury**

Five stops bring you to the Hythe Formation beds and Bargate member with derived phosphatised Jurassic fossils, and the variable lithology of the Folkestone Formation including cross-bedded sands.

**Start Point** Great Halfpenny Lane TQ 0215 4842

#### **Itinerary 10 Redhill – Bletchingley – Godstone**

Seven stops cover the very variable succession, based on the Nutfield type sections, from oldest to youngest. Seen are the Hythe Beds, the Nutfield 'beds' and Redhill 'sands' in the Sandgate Formation, and the Folkestone Formation.

**Start Point** Walkingstead Pond TQ 3621 5078

### **Itinerary 11 The eastern North Downs**

Three stops take you to quarries for Kentish Rag with the Hythe Formation exposed, the fossiliferous Rag & Hassock (Hythe Formation), the Sandgate Formation, Fuller's Earth, and ammonite, brachiopods, and sponges among the fossils.

**Start Point** Dryhill TQ 498 552

## **GA Guide No. 60 Geology of the Isle of Wight, 1998**

Allan Insole, Brian Daley & Andy Gale

The purpose of this field guide is twofold: to provide a general introduction to the island's geology and secondly to provide descriptive accounts of locations which can be visited to see this geology. The island is an importance source of fossils and has some of the richest collecting locations in Britain. It is commonly known as the 'Dinosaur Island'.

**Cost:** Members Price: £9.00, Non-Members Price: £12.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

### **Itinerary 1 Bembridge Foreland**

The low cliffs around Bembridge Foreland provide discontinuous exposers of the Quaternary (Ipswichian and Devensian) deposits of the northeastern corner of the Island.

**Start point** Car Park at the Foreland (SZ 655 873) or Car Park at Lifeboat Station, Lane End (SZ 656 881)

### **Itinerary 2 Whitecliff Bay**

The cliffs forming the southern end of Whitecliff Bay and their southerly continuation in Culver Cliff (Itinerary 3) afford the most complete and reasonably accessible section through the entire Chalk Group succession in southern England. In Whitecliff Bay itself, within a distance of just over one kilometre, a little over 500m of late Palaeocene to late Eocene strata are visible. These exposures provide the most continuous section of this age in northwest Europe and is consequently of international, as well as national, importance. The cyclic transgressive/regressive nature of the Palaeogene succession is clearly demonstrated by the variable character of lithology and fauna. Whitecliff Bay and Alum Bay/Headon Hill (Itineraries 15 & 16) provide serial sections through the shallow marine and nonmarine sediments deposited during the Palaeogene. It is instructive to compare and contrast the successions exposed at these two sites.

**Start point** Car Park at the Foreland; unsuitable for coaches (SZ 655 873) or Car Park at Whitecliff Bay Holiday Park (SZ 639 865) small vehicles only outside the summer season.

### **Itinerary 3 Sandown Bay North**

The cliff section between Yaverland and Culver Cliff at the northern end of Sandown Bay exposes almost the whole of the local Cretaceous succession. In recent years parts of the succession have become obscured by landslips but it is possible to see much of the Wessex and Vectis Formations, most of the Lower Greensand Group and the Lower Chalk Formation. The section lies on the northern limb of the Sandown anticline and there is a gradual increase in dip from about 10 degrees North at Yaverland to nearly vertical at the eastern end of Culver Cliff.

**Start point** Public Car Park opposite Sandown Zoo (SZ 611 849) for cars and minibuses

### **Itinerary 4 Central Sandown Bay**

The cliffs between Sandown and Shanklin expose the central part of the Ferruginous Sands Formation. The exposures lie on the southern limb of the Sandown Anticline, the beds dipping at a shallow angle, generally less than 5 degrees to the south, this being interrupted by a low amplitude anticline between Little Stairs and Shanklin Chine. Deep weathering and the general rarity of fossils makes correlation between this section and that of the type section in Chale Bay (Itinerary 7) uncertain. However, it appears that the equivalent to the succession between the unnamed Member VI and the New Walpen Chine Member is represented. The base of the cliff has been protected from marine erosion by a massive sea wall and this has resulted in a general deterioration of the exposures. Furthermore some sections of the cliff have been obscured by further anti-erosion works.

Nevertheless, the section here reveals some features which are either absent or difficult to access at either Ferruginous Sands localities.

**Start point** Southern end of Sandown Esplanade (SZ 596 838) or in reverse direction from northern end of Shanklin Esplanade (SZ 588 819). No coaches at either point.

#### **Itinerary 5 Knock Cliff and Luccombe Bay**

The cliffs at the southern end of Sandown Bay expose a Lower Greensand Group sequence ranging from the uppermost part of the Ferruginous Sands Formation to the basal part of the Carstone. The Ferruginous Sands here are relatively fossiliferous and the Sandrock is rich in both trace fossils and sedimentary structures.

**Start point** Southern end of Shanklin Esplanade (SZ 585 811). Cars and minibuses only.

#### **Itinerary 6 The Western Undercliff (Binnel Bay to Rocken End)**

The main objective of this itinerary is to investigate the solid geology of the upper part of the Lower Greensand Group, Gault, Upper Greensand and Lower Chalk. There are also some features which relate to the mass movements which were responsible for the formation of the Undercliff.

**Start point** Road adjacent to Buddle Inn, Nilton (SZ 503 757). Cars and minibuses only; no coaches.

#### **Itinerary 7 Chale Bay**

This itinerary examines the type section of the Lower Greensand Group between Atherfield and Rocken End. The beds dip about 3 degrees NW in Chale Bay and as a consequence the Lower Greensand is exposed over a distance of about 5km.

**Start point** Shepherd's Chine at the western end; roadside verge parking (SZ 451 799). Whale Chine towards the centre of the section; car park (SZ 470 784) and the footpath past Knowles Farm (SZ 497 754) at the eastern end.

#### **Itinerary 8 Mass Movements in the Blackgang Area**

The objective of this itinerary is to examine some of the spectacular examples of mass movement which can be seen in the Undercliff, the coastal area between Luccombe in the east and Blackgang Chine in the west.

**Start point** Car Park at Blackgang Chine (SZ 489 768).

#### **Itinerary 8a Chale Terrace**

#### **Itinerary 8b Blackgang**

**Start point:** Car Park at Blackgang Chine (SZ 489 768).

#### **Itinerary 8c Gore Cliff**

**Start point:** Viewpoint Car Park above Blackgang Chine (SZ 490 767). Coach parking difficult in summer season.

#### **Itinerary 8d Sandrock Road**

**Start point** National Trust Car Park at western end of Sandrock Road, west of Niton (SZ 494 759). Not suitable for coaches.

#### **Itinerary 9 Cowleaze Chine to Atherfield Point**

The whole of the Vectis Formation and the uppermost part of the Wessex Formation can be examined in an oblique section through the gently dipping southern limb of the Brighstone Anticline exposed on the coast between Cowleaze Chine and Atherfield Point. Rapid erosion has produced marked deterioration of the exposures in recent years, with large parts of the Vectis Formation now obscured by landslips.

**Start point** Beside the A3055 about 250m east of the Atherfield Holiday Camp (SZ 451 799)

#### **Itinerary 10 Brighstone Bay**

The objective of this itinerary is to examine the cliff and foreshore sections in the Wessex Formation from Chilton Chine eastwards to Ship Ledge. Of particular interest in this area are the large-scale cross-bedded mudstone units and the so-called plant debris beds, of which the Grange Chine Black Band is an excellent example. Coastal erosion is fairly rapid along this part of the coast and the state of exposures is therefore unpredictable.

**Start point** Footpath (BS72) from the Car park at Chilton Chine (SZ 410 822) or footpath (BS57) down western side of Grange Chine (SZ 420 817).

#### **Itinerary 11 Brook Undercliff**

The excellent cliff exposures between Chilton Chine and Sudmoor Point allow a rare opportunity to examine the vertical and lateral relationships within a Wessex Formation fluvial channel sandstone unit, the Sudmoor Point Sandstone, together with the adjacent overbank mudstone deposits.

**Start point** Recommended east to west from Chilton Chine Car Park (SZ 410 822).

### **Itinerary 12 Hanover Point**

This itinerary examines the Wealden group section between Brook Chine and Shippard's Chine, where exposures occur in the northern limb of the Brighstone Anticline. The main interest at this locality is the sedimentology of the Wessex Formation and in particular the plant debris beds, including the so-called "Pine Raft" at Hanover Point, and the several horizons in which dinosaur-induced deformation structures are apparent.

**Start point** Either Brook Chine (SZ 384 836) or Shippard's Chine (SZ 376 842).

### **Itinerary 13 Compton Bay**

This itinerary covers the Cretaceous sequence exposed in an oblique section through the northern limb of the Brighstone Anticline in Compton Bay. It extends from the base of the Lower Greensand Group to the lower part of the White Chalk Formation.

**Start point** Car Park a short distance above Compton Chine (SZ 370 851). Not suitable for coaches.

### **Itinerary 14 Freshwater Bay**

Freshwater Bay affords easily accessible sections through highly tectonised chalk in the Chalk Formation which was in places broken up by freeze-thaw activity under periglacial conditions during the Pleistocene.

**Start point** Car (no coaches) Park in the centre of the bay or that immediately west of the Albion Hotel (SZ 346 857). Coaches may be parked in a small car park above the eastern side of the bay.

### **Itinerary 15 Alum Bay**

The famous "coloured sands" make Alum Bay the best known and most visited geological locality on the Isle of Wight. With their continuation into Headon Hill, the cliffs of Alum Bay exhibit an essentially complete sequence from the uppermost part of the Chalk Group through the late Palaeocene to late Eocene beds.

**Start point** Car Park at Needles Pleasure Park (SZ 306 854).

### **Itinerary 16 Headon Hill**

The prime objective of this itinerary is to examine the type locality of the Headon Hill Formation and some of its constituent members. A variety of sedimentary facies is represented here, including good exposures of freshwater limestones and calcretes. The site is famous for its well preserved fossils. Molluscs are the most common macrofossils, but vertebrates also occur, including fish, reptiles and mammals.

**Start point** Car Park at Needles Pleasure Park (SZ 306 854). A path also descends from the customers' car park at the Headon Hall Tea Rooms (SZ 306 857).

### **Itinerary 17 Colwell Bay**

At Colwell Bay a low cliff section, together with intermittent foreshore exposures, provide an opportunity to examine the lower part of the Headon Hill Formation. The section is particularly noteworthy for the presence of a very fossiliferous development of the Colwell Bay Member. Overall, it provides an interesting comparison with the succession seen on Headon Hill (Itinerary 16), from which it differs in a quite striking manner, and also with that at Whitecliff Bay (Itinerary 2).

**Start point** Colwell Chine Road at the seaward end of which is a public car park (SZ 327 878).

### **Itinerary 18 Bouldnor and Hamstead**

The foreshore and intermittent cliff sections along the coast between Bouldnor and Hamstead provide the only locality where the whole of the Bouldnor Formation may be examined. The Bembridge Marls Member and the lower part of the overlying Hamstead Member are best exposed in the cliff and foreshore section on the coast north of Hamstead (around SZ 400 918). The upper part of the formation, the Cranmore Member, is accessible at the top of the cliff northwest of Cranmore (SZ 386 904).

#### **Itinerary 18a Hamstead Ledge**

**Start point** Access is possible by car along the private road towards Hamstead Farm (SZ 400 913).

#### **Itinerary 18b Cranmore**

**Start point** Drive up Cranmore Avenue to the road junction at the top of the hill (SZ 390 907)

### **Itinerary 19 Thorness and Gurnard**

This itinerary covers the exposures of the Bouldnor Formation and the Bembridge Limestone in Thorness Bay and for a short distance to the north of Gurnard Ledge. The best known feature of this locality is the thin Bembridge Insect Bed which has yielded a prolific flora and insect fauna. Various macrofossil (mainly molluscan) assemblages representing brackish to freshwater environments also occur, whilst an unusual silicified development in the Bembridge Limestone contains pseudomorphs after gypsum.

**Start point** best approached from the northeast by footpath from Gurnard Bay. Limited car parking space beside the road at the western end of Marsh Road, Gurnard (SZ 471 953).

## **GA Rockwatch Guide No. 1 North shore of the Isle of Sheppey, Kent**

Adrian Rundle

A pocket guide to the London Clay exposed on the North Shore of the Isle of Sheppey, Kent. It has general information on the fossils of the London clay along with helpful suggestions for collecting. There are sections with short descriptions of fossil types to be found, accompanied by clear, labelled illustrations. A neat pocket guide, easy to use in the field.

**Access** Warden Beach Car Park, off Warden Bay Road, Warden TQ 023 718

**Cost** Members Price: £3.50, Non-Members Price: £3.95 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

## **MOLE VALLEY GEOLOGICAL SOCIETY**

[www.mvgs.org.uk](http://www.mvgs.org.uk)

### **Guildford Building Stones Walk**

Surrey RIGS

A one mile linear walk around the town looking at the building stones.

**Start point** Tunsgate Arch, High Street SU 997 494

**Cost** Free, available to download from the internet: [www.mvgs.org.uk](http://www.mvgs.org.uk)

### **Albury Trail**

The circular Geology Trail from Newlands Corner to Albury and back was devised by Iain Fletcher and his Surrey RIGS Group some years ago. It was produced as a booklet funded by SITA, but which is now out of print and has been scanned and put on the website to be used by all. It includes an excellent cut-away diagram of the landscape showing exactly where the 9 stops are with a more detailed description of each including stratigraphic column and diagrams and photographs.

**Start point** Newlands Corner car park TQ 042 492

**Cost** the booklet is now out of print but it is scanned and freely available on the website: [www.mvgs.org.uk](http://www.mvgs.org.uk)

### **The Box Hill & Mole Valley Book of Geology**

Richard Selley, 2006

Friends of Box Hill. Dorking.

**Available** from Dorking Museum: [www.dorkingmuseum.org.uk](http://www.dorkingmuseum.org.uk).

### **Dorking Caves: History, mystery and geology**

Richard Selley, 2015

**Entrance** South Street, Dorking TQ 163 494 Details of cave tours visits via Dorset Museum

**Available** from Dorking Museum: [www.dorkingmuseum.org.uk](http://www.dorkingmuseum.org.uk)

### **The Geology of St Barnabas Church, Ranmore Common, Dorking**

Richard Selley, 2008

**Location** North Downs Way, near Ramnor Common Way at TQ 145 504

**Available** from St Barnabas.

## **OPEN UNIVERSTIY GEOLOGICAL SOCIETY LONDON BRANCH**

[www.lougs.org.uk/localgeo/geowalks.htm](http://www.lougs.org.uk/localgeo/geowalks.htm)

### **Hog's Back Geowalk, 2013**

Devised by Brian Harvey in 2002 for LOUGS, the Hog's Back Geowalk has been written up and published by Iain Fletcher. It is a circular country walk of 7 miles from central Guildford westwards to Compton and back. As there are few accessible geological exposures, it explores the relationships between geology,



topography, land use and building stones. The route is mostly on footpaths and pavements, including a section along the river, and mostly of gentle gradient except for the Chalk slopes up and down the Hog's Back ridge.

**Start point** SU 9950 4918

**Cost** free pdf [www.lougs.org.uk/localgeo/geowalks.htm](http://www.lougs.org.uk/localgeo/geowalks.htm)

### **Albury Trail**

The circular Geology Trail from Newlands Corner to Albury and back was devised by Iain Fletcher and his Surrey RIGS Group some years ago. It was produced as a booklet funded by SITA, but which is now out of print and has been scanned and put on the website to be used by all. It includes an excellent cut-away diagram of the landscape showing exactly where the 9 stops are with a more detailed description of each including stratigraphic column and diagrams and photographs.

**Start point** Newlands Corner car park TQ 042 492

**Cost** free pdf [www.lougs.org.uk/localgeo/geowalks.htm](http://www.lougs.org.uk/localgeo/geowalks.htm)

## **OXFORDSHIRE GEOLOGY TRUST**

[www.oxfordshiregt.org](http://www.oxfordshiregt.org)

### **Secrets in the landscape series**

**Cost** £2 available online from: [www.thematic-trails.org/](http://www.thematic-trails.org/) or by post through OGT

#### **1. Faringdon Trail**

An 8 km circular walk starting in Faringdon town centre following the the golden ridge of the Corallian Faringdon Limestone.

**Start point** The Bell Hotel, Faringdon

#### **2. Kirtlington & Bletchingdon Trail**

A rural walk taking in beautiful landscapes.

#### **3. Oxford City Trail**

A city trail showing how local rock is used in Oxford's building stones.

#### **4. Stonesfield Trail**

Discover Stonesfield's fascinating prehistoric past.

#### **5. White Horse Trail**

Explore the geology underpinning Oxfordshire's famous landmark.

#### **6. Adderbury Trail**

A short stroll exploring this characteristic ironstone village.

#### **7. Burford Trail**

A circular walk taking in a classic Cotswold town and its surrounding landscape.

#### **8. Chipping Norton Trail**

Find out how the Cotswold landscape is dictated by its underlying geology.

## **WEST SUSSEX GEOLOGY**

[www.westsussexgeology.co.uk](http://www.westsussexgeology.co.uk)

### **Fossil Hunting at Bracklesham & Selsey**

David Bone, 2009

A geological Guide to collecting fossils in Bracklesham Bay, starting at either Bracklesham or Selsey

**Start point** Bracklesham Car Park SZ 806 963

**(Cost** out of print – update due 2016)

### **The Stones of Boxgrove Priory**

David Bone, 2010

A guided walk around both the ruins and the extant church, inside and out to view 12 different building stones, many of them local, including the little-known Lavant Stone.

**Start point** Outside the south porch SU 9075 0745

**Cost** £4 [www.westsussexgeology.co.uk/page1-02.html](http://www.westsussexgeology.co.uk/page1-02.html)

### **Bognor's Rocks, a geological Guide**

David Bone, 2014

A guide to the different rocks found near Bognor, starting with the London Clay at Bognor and going deeper to the Reading Formation and the White Chalk to the west along the Coast to Felpham.

**Start point** Bognor Beach, opposite the end of Nyewood Lane SZ 925 986

**Cost** £4 [www.westsussexgeology.co.uk/page1-02.html](http://www.westsussexgeology.co.uk/page1-02.html)

## REGION 9: SOUTH WEST

### DORSET'S IMPORTANT GEOLOGICAL SITES GROUP (D.I.G.S.)

[www.dorsetrigs.org.uk](http://www.dorsetrigs.org.uk)

#### The Poxwell Pericline, 2008

The Poxwell Pericline is one of the best examples in the UK of a landform reflecting this unusual geological structure. The 5 km walk takes you anticlockwise completely round the structure to encounter different Jurassic and Cretaceous rock types.

**Start point** Poxwell Old Quarry, south of Poxwell SY 793 835

**Cost** free from Weymouth Tourist Information Office or via [www.dorsetrigs.org.uk/publications/](http://www.dorsetrigs.org.uk/publications/) (P&P charged)

#### A geological walk around Weymouth

A circular walk of 7 km to look at the local Late Jurassic and Cretaceous rocks in the vicinity as well as encountering them in the building stones.

**Start point:** Radliff View at the end of Bincleaves Road, Weymouth SY 680 781

**Cost** free from Weymouth Tourist Information Office or via [www.dorsetrigs.org.uk/publications/](http://www.dorsetrigs.org.uk/publications/) (P&P charged)

#### The Geology of Brownsea

**Cost** free from Weymouth Tourist Information Office or via [www.dorsetrigs.org.uk/publications/](http://www.dorsetrigs.org.uk/publications/) (P&P charged)

#### Beneath your Feet: Countryside walks to explore the rocks that form the landscape of West Dorset and Purbeck (2 packs)

DIGS have published two attractive packs of self-guided leaflets to allow you to explore Dorset's geological and stone heritage. Each pack contains five leaflets.

**Cost** : £3.95 each, available by post via [www.dorsetrigs.org.uk/publications/](http://www.dorsetrigs.org.uk/publications/) (P&P charged)

## GEOLOGISTS' ASSOCIATION

[www.geologistsassociation.org.uk](http://www.geologistsassociation.org.uk)

**Guides Editor: Susan Marriott**

#### GA Guide No. 22 Dorset, 2016 (new edition)

John C. W. Cope

The Dorset coast has provided the training ground for many aspiring geologists and also attracts amateur geologists in large numbers. This guide provides information that will be accessible to those from all levels of geological background. In addition to the description of the succession, the guide covers many other aspects of the geology as they arise and includes information about access. The new edition has been revised with a bit of new stratigraphy, some new figures and new logistics following storms. There is also a new section with seismic lines and interpretations.

**Cost:** Members Price: £11.00, Non-Members Price: £14.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

## **WEST DORSET**

Pinhay Bay to Lyme Regis

**Access** via the coastal path from the cob at Lyme Regis SY 338 916 (Pinhay Bay SY 318 907)

Lyme Regis to Charmouth

Charmouth to Seatown

Seatown to Eype Mouth

Eype mouth to West Bay

Bridport

West Bay to Burton Bradstock

## **SOUTH DORSET**

Abbotsbury and Porlesham areas

**View Point** c. SY 561 860

Bathonian and basal Callovian of the Fleet coast

Callovian, Oxfordian and basal Kimmeridgian of the Fleet coast

Oxford Clay, Corallian Group and Kimmeridge Formation on the coast south of Weymouth

Isle of Portland

The Weymouth Relief Road

Browleaze Cove to Ham Cliff

Ringstead Bay and White Nothe

The Abbotsbury and Ridgeway Faults northeast of Weymouth

## **PURBECK AND EAST DORSET**

The Lulworth area

**Car Park** at Lulworth SY 820 801

Warbarrow Bay

Kimmeridge Clay of the type area

Portland Stone of Purbeck

Durlston Bay

Swanage Bay

## **GA Guide No. 31 West Cornwall, 2005**

A. Hall

West Cornwall A classic area of British geology on account of its wide variety of igneous and metamorphic rocks, and its mineral deposits, especially tin and copper. The five itineraries cover all the prime localities in the region where these rocks can be examined including Land's End, Marazion, St. Michael's Mount, Cligga Head, Kynance Cove and The Lizard.

**Cost:** Members Price: £5.00, Non-Members Price: £7.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

### **Itinerary 1 Land's End Peninsula**

The Land's End peninsula corresponds roughly with the outcrop of the Land's End granite intrusion, and the granite does not extend far beyond the present coastline. Patches of the metamorphic aureole are preserved at many places along the north and west coasts, at Longships lighthouse at Land's End, and at Tater-du on the south coast of the peninsula. The hardening of the country rocks by contact metamorphism has evidently made them more resistant to erosion than the unaltered sediments away from the granite.

**Start Point** Lands End: SW 3418 2534

### **Itinerary 2, Mount's Bay**

The coast between the Land's End and Lizard peninsulas offers a complete section through the Tregonning-Godolphin granite and exposures of several smaller igneous intrusions. The itinerary begins at Marazion and ends at Porthleven.

**Start Point** Marazion SW 524 305

### **Itinerary 3, St. Agnes District**

The St. Agnes district has been an important mining area in the past. It includes two small granite bosses, those of Cligga Head and St. Agnes Beacon, and their metamorphic aureoles. The mineralisation is concentrated around the two intrusions, which are therefore regarded as 'emanative centres'. The area is also notable for the only outcrop of Miocene sedimentary rocks in Britain.

**Start Point** Cligga Head, Perranporth SW 737 536

### **Itinerary 4, Falmouth Bay**

The coast around Falmouth is a convenient area in which to examine the Devonian sedimentary rocks in an unmetamorphosed condition. Within the Gramscatho Group, a distinction can be made between the Falmouth Beds, in which light brown sandstone predominates, and the Portscatho Beds, which are mainly grey slates. This 'stretch of coastline also shows two very interesting minor igneous intrusions. The estuary of the River Fal is a classic example of a drowned valley resulting from a rise in sea-level or subsidence of the land.

**Start Point** Falmouth, Pendennis point 826 316

### **Itinerary 5, The Lizard Peninsula**

The Lizard peninsula is famous for the variety of igneous and metamorphic rock types which occur there, including the serpentinite which is the best example of its kind in England. Inland, the peninsula consists of a flat platform about 80 m above sea-level and there are relatively few exposures, but around the coast there are excellent sections of all the principal rock types.

**Start Point** Jangye Ryn SW 658 207

## **GA Guide No. 41 The Geology of Jersey, 2003**

A.C.Bishop, D.H.Keen, S.Salmon & J.T.Renouf

The rocks of the island are well displayed in coastal exposures, and the clean, wave polished surfaces are ideal for studying rock relationships and textures. The 9 itineraries cover most of the island's geology -

metamorphic and igneous rocks, plutonic intrusions, etc. of the Cadomian Orogeny - in coastal sections.  
**Cost:** Members Price: £5.00, Non-Members Price: £7.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

### **Itinerary 1 St Helier**

St Helier sits in the southeast igneous complex, extending from Elizabeth Castle to Gorey and consisting of andesite/agglomerate, granite/granophyre and diorite. The rock types and their interrelationships can be viewed at 8 locations, some offshore where tidal incursions can be extremely dangerous.

**Start Point** Elizabeth Castle 49.103370N, 2.073149W (BGS 390991, -80302)

### **Itinerary 2 Green Island and Le Nez Point**

Constituting the southernmost area of the southeast igneous complex, granite and diorite are accessible at three locations. Areas east of Havre des Fontaines should only be attempted by those who are thoroughly familiar with the reefs, the tide and tidal runs.

**Start Point** Le Croc Point 673 462 (BGS 394386, -81922)

### **Itinerary 3 Mont Orgueil to La Coupe**

This itinerary consists of 8 locations between the above-named, accessed along the northeastern coast. Rhyolite and ignimbrite and the Rozel Conglomerate Formation are prominent. La Coupe is accessible only at half-tide.

**Start Point** Mont Orgueil Castle 716 503 (BGS 998622, -78061)

### **Itinerary 4 St Aubin to St Ouen's Bay**

8 locations around the perimeter of Noirmont peninsula include igneous rocks, Jersey shale formation, loess strata, and peat/buried forest, an old quarry, and a famous archaeological cave site La Cotte de St Brelade (no entry). Ouaisné requires low tide.

**Start Point** Bulwarks, St Aubin 607 486 (BGS 387867, -79976)

### **Itinerary 5 L'Étacq to Le Pinnacle**

The Northwest Granite Complex requires visiting during half-tide to low tide. Granite, Jersey Shale Formation and Brioverian sediments are exposed at 4 locations and can be visited in half- to low-tide.

**Start Point** Disused quarry nr Le Pulec 558 543 (BGS 382618, -73380)

### **Itinerary 6 Ronez and Sorel Point**

Continuing in the Northwest Granite Complex, this itinerary focuses on granite–diorite–gabbro relationships. On Sorel Point, beware of calm sea swells; access to tidal rocks between Sorel Point and Le Fossé Vicq is dangerous. Itinerary 7b can also be started from Sorel Point.

**Start Point** Ronez Point car park 625 557 (BGS 388440, -71029)

### **Itinerary 7a Devil's Hole to L'Âne and Grève de Lecq**

A signposted path leads to the Devil's Hole (creux), lined with broken granite of the cliff in a crush zone. Climbing the clifftop path towards L'Âne and Grève de Lecq gives a good view of the creux, a sea stack at Île Agois, and porphyritic granodiorite of the Northwestern Granite at Grève de Lecq.

**Start Point** Priory Inn car park 607 558

### **Itinerary 7b Devil's Hole to Sorel Point**

This walk along the clifftop, down into Le Mourier Valley to see granite with aplite veins, then upwards to the north for diorite veined by granite and pegmatitic granite pipes in diorite. This walk can start from the opposite direction at Sorel Point.

**Start Point** Priory Inn car park 607 558

### **Itinerary 8 Côttil Point to Les Rouaux**

This itinerary covers 8 discontinuous locations along the northeast coast; part of the coast is of difficult access and can be cut off by rising tide. Aplogranite, various volcanics including silicified rhyolitic ash, raised beaches of flint pebbles, and Brioverian sediments are featured.

**Start Point** St John's Church 627 554 (BGS 390693, -72005)

### **Itinerary 9 Bouley Bay**

Rhyolitic ash, mudstones preserving fossil rain-prints, Rozel Formation conglomerate in an alluvial fan are viewable in a cove setting. The rocky descent to the cove shingle is very slippery.

**Start Point** Pot de Rocher 677 539

## **GA Guide No. 47 The Coastal Landforms of West Dorset, 1992**

Robert J.Allison

A series of itineraries illustrating the geology and denudational history along the coastline of West Dorset. This most beautiful coast is world famous for its spectacular recurrent landslides and the causes of these are fully explored together with their effects on shingle movement at beach level, the latter and best known being Chesil Beach.

**Cost:** Members Price: £9.00, Non-Members Price: £12.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

### **Denudation history**

Start point Cockpit Hill ST 413 012

### **Landslide types and processes**

Black Ven, SY 355 929

Higher Sea Lane SY 363 930

Stonebarrow Hill SY 375 927

### **Urban landslides**

Lyme Regis SY 337 918

### **Costal sediment supply and transport**

Charmouth SY 366 929

Seatown SY 420 916

Eyp SY 448 910

### **Chesil Beach**

**Viewpoint** car part on summit at north end of Isle of Portland SY 691 731

### **Access**

Chiswell sea wall SY 683 735

Portland causeway SY 670 750

Abbotsbury SY 577 854

West Bexington SY 532 865

Cogden Beach SY 504 880

Burton Bradstock SY 486 896

West Bay SY 462 904

## **GA Guide No. 66 The Geology of Watchet and its Neighbourhood, Somerset, 2006**

Eric Robinson

A short guide, very suitable for beginners, to the Devonian, New Red Sandstone and Jurassic (Lias) rocks in the vicinity of Watchet. Relatively gentle walks along the foreshore and inland to view exposures, plus the added bonus of examining the usage of local and imported rocks for walls, housing and bridges.

**Cost:** Members Price: £4.00, Non-Members Price: £5.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

### **1 The Palaeozoic Foundations**

Inland exposures of Mid Devonian sandstones and grits

**Start point** Park and picnic place on A39 near West Quantoxhead: ST 114 417

### **2 The New Red Sandstone**

Triassic pebble beds can best be seen in Woolston Quarry, in the Doniford Valley between the Quantock and Brendon Hills. Carboniferous limestone is found within the same quarry.

**Start point** Woolston Quarry: ST 094 403

### **3 Watchet Foreshore**

Triassic-Jurassic transition beds on coastal sections either side of Watche Harbour.

**Start point** Splash Point: ST 077 436

### **4 Watchet West Beach**

Faulting on the foreshore makes stratigraphy difficult but distinctive pebbles and fossils can provide clues.

**Start point** West Street Slipway: ST 068 434



## 5 Watchet Townscape

A look at local building stones in the walls of the town. Some of the examples came from further afield, maybe brought as ballast.

**Start point** Entrance to the Watchet Museum at the top of the main slipway to the modern marina: ST 071 434

## 6 Hellwell Bay

Triassic-Jurassic boundary less faulted than elsewhere

**Start point Walk** From the car park beside the railway inland from Hellwell Bay, take the path to the headland: ST 078 434

## 7 The Mineral Line

The Mineral Line delivered iron ore from the Brenden Hill mines to Watchet between 1856 and World War 1. The route is traced from Watchet to Washford. In season a steam train can transport you back to Watchet.

**Start point** West Quay car park: ST 070 435

## GA Guide No. 71 The Coast of the Bristol Region: Quaternary Geology and Geomorphology,

compiled by David J. Case 2013

The Quaternary geology and geomorphology of the Bristol Region coastline has great importance as a record of, and analogue for, climate fluctuation and sea-level change. This guide covers five excursions between Oldbury Flats, c. 7 km north-east of the First Severn Road Bridge, to Lilstock, c. 12 km west of Burnham-on-Sea:

**Cost:** Members Price: £4.00, Non-Members Price: £5.00

[www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

### Excursion 1 Aust-Northwick Warths, Oldbury Flats

*John R.L. Allen*

A day trip looking at Late Quaternary geology and geomorphology in the Severn Estuary, Aust-Northwick Warths and Oldbury Flats.

**Start point** Park on B4461 to WSW of Aust village: ST 563 887

### Excursion 2 Gordano Valley

*Ann Bridle, Tom Hill, Chris Spencer & Wendy Woodland*

Pleistocene glaciation and Holocene sea-level rise, in the Gordano Valley.

**Start point** Mouth of Walton Valley, 3 km NE of Clevedon (M5 Junction 20): ST 423 737

### Excursion 3 Middle Hope and Sand Bay

*David J. Case*

A circular walk, c. 6 km, looking at the Late Quaternary geology and geomorphology of the Middle Hope headland and Sand Bay.

**Start point** National Trust Car Park at N end of Beach Road, Sand Point: ST 330 659

### Excursion 4 Burnham-on-Sea to Brean Down

*Chris Spencer*

Late Devensian geology and Holocene coastal development, Burnham-on-Sea to Brean Down.  
**Start point** Berrow Beach: ST 288 524 (park off the main B3140 road, close to St. Mary's Church)

### **Excursion 5 Lilstock to Stert**

*David J. Case*

Holocene coastal change and geomorphology of the Lilstock to Stert coastline, mostly within the Bridgwater Bay National Nature Reserve.

**Start point** Lilstock car park between village and beach: ST 172 453 (via A39 from Bridgwater)

## **GA Guide No. 72 Devonshire Marbles**

Gordon Walkden 2015

This is a combined research volume and comprehensive introduction to what is probably Britain's most spectacular and diverse decorative marble, yet the least well-known. The GA guide is in two volumes. Volume 1: Understanding the marbles, highlights the discovery, characteristics and uses of Devonshire marble, its origin amongst the Devonian Coral seas of Devon and the formation of its rich textures in the geological upheavals that followed. In Volume 2: Recognising the marbles, there are guides to the best outcrops of the limestones, to the 30 best buildings up and down the country that contain the 'marbles', to the fossils, once collector's items, and of course to the marbles themselves, of which there are at least 20 distinct varieties.

**Cost:** Members Price: £9.00 each for Vols 1 & 2; Non-Members Price: £12.00

[www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

### **Itineraries in Volume 2**

#### **The exposures**

#### **Section 1. The Plymouth Area (P)**

Itinerary P1 Mount Batten (SX 486 533) and Radford Quarry

Itinerary P2 The Western King limestone headland, west Plymouth (SX 461 533)

Itinerary P3 Cattedown (SX 495 535)

Itinerary P4 Plymouth Hoe foreshore (SX 474 537)

#### **Section 2 South-east Devon (T)**

Itinerary T1 Triangle Point (SX 9280 6288), Hope's Nose (SX 948 635) and Dyer's Quarry (SX 922 628)

Itinerary T2 Berry Head, Brixham (SX 948 566) and Petit Tor Down, Torquay (SX 924 662)

Itinerary T3 East Ogwell and the Lemon Valley, Newton Abbott (SX 839 711)

#### **Section 3 Supplementary itineraries (S)**

Itinerary S1 The streets of Ashburton (Quarry SX 754 700)

Itinerary S2 Long Quarry Point, Torquay (Walls Hill car park SX 9285 6528)

### **Devonshire Marble Buildings**

#### **Group 1, Central London** (all difficult to gain access)

Goldsmiths' Hall, 13 Foster Lane, City of London EC2V 6BN (TQ 322 813)

The Gibson Hall, 13 Bishopsgate, City of London EC2N 4AJ

Lloyd's Register, 71 Fenchurch Street, City of London EC3N 4BS

### **Group 2, West London**

Brompton Oratory, Brompton Road, South Kensington, SW7 2RP (TQ 271 791)

The Natural History Museum, Exhibition Road, South Kensington, SW7 4BD

St. Augustine's Church, 117 Queen's Gate, South Kensington SW7 5LW

### **Group 3, West London**

St James's Church, Sussex Gardens, Paddington, W2 3UD (TQ 266 809)

Westminster Cathedral, Victoria Street, Victoria (TQ 292 791)

(Clery's Office, 42 Frances Street, SW1P 1QW)

### **Group 4, Birmingham**

Birmingham City Art Gallery and Museum, Chamberlain Square B3 3DH (SP 066 869)

Birmingham Grand Hotel, Colmore Row (entrance will be on Church Street SP 069 871)

### **Group 5, Oxford**

Exeter College Chapel, 27 Broad Street OX1 3DP

Oxford University Museum of Natural History, Parks Road OX1 3PW (SP 514 069)

Keble College Chapel, 16 Parks Road OX1 3PG

### **Group 6, Cambridge**

The Sedgwick Museum, Downing Street, CB2 3EQ (TL 450 581)

St John's College Chapel, St John's Street, CB2 1TP

The Fitzwilliam Museum entrance hall, Trumpinton Street CB2 1RB

### **Group 7. Torquay centre**

Church of St Mary Magdalene, Uniorn Street TQ1 4BX (SX 912 643)

Torbay Town Hall, Lymington Road TQ1 4BW

Torquay 'new' Public Library, Lymingotn Road TQ1 3DT

### **Group 8, Torquay (Babbacombe and St Marychurch)**

All Saints Church, Cary Avenue, Babbacombe TQ1 3QT (SX 924 652)

The Royal Marble Works, St Marychurch Road, Babbacombe TQ1 4LY

Torquay Museum, 529 Babbacombe Road TQ1 1HG

Church of St John the Apostle, Montpellier Road, Torquay TQ1 1BJ

### **Group 9, Plymouth**

Plymouth Cathedral, Wyndahm Street East, PL1 5ER (SX 470 548)

Guildhall, Plymouth, Armada Way PL1 2AD

Plymouth Civic Centre and Council House, Armada Way PL1 2AA

### **Group 10, Exeter**

Exeter Cathedral, 1 The Cloisters EX1 1HS (SX 920 925)

Church of the Sacred Heart, 25 South Street, Exeter EX1 1EB

Royal Albert Memorial Museum, Queen Street EX4 3RX

Devon County Hall, Topsham Road, Exeter EX2 4QD

### **Group 11, north and west**

The Manchester Town Hall complex, The Rates Hall, Manchester Town Hall extension, entrances on Lloyd Street and St Peter's Square M2 5BD (SJ 839 980)

Dobroyd Castle, Pexwood Road, Todmorden OL14 7JR (SD 929 237)

Todmorden Unitarian Church, Honey Hole Road OL14 6LE (SD 935 238)

The Marble Church, Rhuddlan Road Bodelwydden, Denbighshire, North Wales LL18 5UR  
(SJ 003 756)

## **THEMATIC TRAILS**

[www.thematic-trails.org](http://www.thematic-trails.org)

### **Cornwall – North Cornish Coast**

[www.thematic-trails.org/cornwall-north.htm](http://www.thematic-trails.org/cornwall-north.htm)

#### **Bude Geology Trail**

North Cornwall District Council

A folding 10-page pocket-sized pamphlet including a geology map. A clear trail map and directions cover a two and a half mile walk of about two hours which helps you to explore the coastal scenery and geology of the Bude coastline. Coastal features discussed include folding, ripple marks, load casts, liesegang rings and turbidites. The port's industrial heritage including the canal, lime kilns and the breakwater are also illustrated.

**Start point:** Crescent Car Park in Bude SS 208 063

Cost **70p** [www.thematic-trails.org/cornwall-north.htm](http://www.thematic-trails.org/cornwall-north.htm)

#### **Crackington Geology Trail**

North Cornwall District Council, 2007

A folding 10 page pocket-size pamphlet. A clear map of the trail and an associated geology map offer directions and a commentary for a 5 mile circular walk along the coast (about two hours). Topics include minerals and mining, quarrying, coastal features and a look at beach pebbles.

**Start point:** need start point

Cost **70p** [www.thematic-trails.org/cornwall-north.htm](http://www.thematic-trails.org/cornwall-north.htm)

#### **Pentire Geology Trail**

North Cornwall District Council

A folding 10-page pocket-sized pamphlet including a geology map. A clear trail map and directions cover a four mile walk of about three hours which encourages an exploration of the varied geology of the Pentire peninsula. Landscape features are explained whilst a series of thumb-nail photos facilitate the recognition of rocks and minerals associated with Pentire's industrial mining heritage.

**Start point:** need start point

Cost 70p [www.thematic-trails.org/cornwall-north.htm](http://www.thematic-trails.org/cornwall-north.htm)

### **South Cornwall and Bodmin Moor**

[www.thematic-trails.org/cornwall-south-bodmin.htm](http://www.thematic-trails.org/cornwall-south-bodmin.htm)

#### **Geological Guide to South East Cornwall**

John Macadam, Caradon District Council, 1998

A clear brief guide pack with five double-sided pocket-size (A5) sheets sealed in all-weather plastic coats.

**Cost** £2.75 [www.thematic-trails.org/cornwall-south-bodmin.htm](http://www.thematic-trails.org/cornwall-south-bodmin.htm)

Three trails are included (explanations are simple but lucid).

1. **Lantic Bay** need start point
2. **Minions** need start point
3. **Cawsands Bay** need start point

#### **Explore the landscape and rocks of the St Austell area**

John Macadam. Cornwall County Council 2001.

A well-illustrated full-colour guide pack with pocket-size (A5) sheets sealed in all-weather plastic coats.

The 16-page pack includes information sheets covering rocks, minerals, fossils and folds and faults.

**Cost** £2.75 [www.thematic-trails.org/cornwall-south-bodmin.htm](http://www.thematic-trails.org/cornwall-south-bodmin.htm)

Three trails are included:

1. **Scenic tour around the China Clay area from the Eden Project or Wheal Martyn China Clay Museum** need start point
2. **Granite tor walk** need start point
3. **St Austell town trail** need start point

#### **Pendower and Carne Geological Trail**

John Macadam Cornwall County Council, 1997

A 3 km beach walk suitable for family use but also locates sites of interest for more academic study.

**Start point** SW 894 381

**Cost** 12 page fold-out leaflet. Free [www.thematic-trails.org/cornwall-south-bodmin.htm](http://www.thematic-trails.org/cornwall-south-bodmin.htm)

#### **Roughtor Geology Trail**

North Cornwall District Council

A folding 10-page pocket-sized pamphlet including a geology map. A clear trail map and directions cover a two mile walk of about two hours which gives confidence for an exploration of the geology and granite scenery of Rough Tor on Bodmin Moor. Attention is drawn to evidence of mining, china clay and quarrying as well as explanations for some of the strange landscape features of the granite landscape.

**Start point:** Roughtor Car Park SX 139 819

Cost 70p [www.thematic-trails.org/cornwall-south-bodmin.htm](http://www.thematic-trails.org/cornwall-south-bodmin.htm)

#### **The Copper Trail, Once around Bodmin Moor**

Martin Camp, 2005

A circular walk around the whole of the moor. Taken in its entirety this is about sixty miles but, conveniently for most people, it is divided into 6 day-walks. Included in the walks are high moor, remote farms, ancient monuments including clapper bridges, mines and ruins.

**Cost** 4.95 [www.thematic-trails.org/cornwall-south-bodmin.htm](http://www.thematic-trails.org/cornwall-south-bodmin.htm)

**Day 1 Minions to St Neot**

8 ½ miles

**Start Point** SX 261 712

**Day 2 St Neot to Bodmin**

13 miles

**Day 3 Bodmin to St Breward**

10 miles

**Day 4 St Breward to Camelford**

6 miles

**Day 5 Camelford to Five Lanes**

10 ½ miles

**Day 6 Five Lanes to Minions**

9 miles

## REGION 10: WEST MIDLANDS

### BLACK COUNTRY GEOLOGICAL SOCIETY

[www.bcgs.info](http://www.bcgs.info)

#### **The Geology of the Wren's Nest National Nature Reserve, Dudley**

Black Country Geological Society/Dudley Museum, 2009

A fold-out leaflet explaining the geology of the Wren's Nest, including a geological trail.

**Start point:** Just north of Wren's Hill Road near SO 938 922

**Cost** free on bcgs website: <http://bcgs.info/pub/local-geology/geological-leaflets-and-guides/wrens-nest-leaflet-2009/>

### GEOCONSERVATION STAFFORDSHIRE

<http://srigs.staffs-ecology.org.uk>

#### **The Hamps and Manifold Geotrail**

A 13 km linear trail along the rivers Hamps and Manifold from Hulme End to Waterhouses. Easy access along a resurfaced section of the old Leek & Manifold Valley Light Railway Line.

**Start point** Hulme End (Car Park, Information Centre & toilets)

**Cost** free <http://srigs.staffs-ecology.org.uk/Geotrails/index.html>

#### **The Churnet Valley Geotrail**

A 25 km circular walk starting and finishing at Froghall Wharf. If preferred the walk is broken down into sections.

**Start point:** Froghall Wharf on the Caldon Canal (Car Park, Information Centre & toilets)

**Cost** free <http://srigs.staffs-ecology.org.uk/Geotrails/index.html>

#### **The Cannock Chase Geotrail**

A 25 km circular walk starting and finishing at Satnall Hills. If preferred the walk is broken down into sections.

**Start point:** Satnall Hills on the A513 between Stafford and Rugeley (Car Park)

Cost free <http://srigs.staffs-ecology.org.uk/Geotrails/index.html>

## GEOLOGISTS' ASSOCIATION

[www.geologistsassociation.org.uk](http://www.geologistsassociation.org.uk)

**Guides Editor: Susan Marriott**

### **GA Guide No. 7 Geology of the Manchester District, 1990**

R.M.C.Eagar & F.M.Broadhurst

The rocks exposed in the Manchester area range in age from Dinantian (Lower Carboniferous) to Triassic and superficial coverings of Pleistocene and Recent sediments. Of the sixteen itineraries described, two are devoted to Dinantian, five to the Silurian, four to the Triassic and three to the Pleistocene and Recent. The last two itineraries are concerned with mineralisation and mining and with the building stones of Manchester.

**Cost:** Members Price: £4.00, Non-Members Price: £5.00

[www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

Need details

### **GA Guide No. 27 Geology of South Shropshire, 2002**

M.Allbutt, J.Moseley, C. Rayner & P. Toghil

This guide has itineraries grounded in a well understood and documented stratigraphy that spans all periods from Pre-Cambrian through to Triassic and covers lithologies from volcanic tuffs and lavas through fossiliferous marine and fluvial sediments to aeolian sandstones. The authors hope to share their thrill of finding that the older classic areas of Shropshire still have the capacity to inspire.

**Cost:** Members Price: £9.00, Non-Members Price: £12.00

[www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

#### **Itinerary 1 The Longmynd area**

John Moseley

The purpose of this itinerary is to examine representative sections of the late Precambrian sedimentary sequence that forms the Longmyndian supergroup.

**Start Point** Ragleth Inn, Little Stretton SO 442 911

#### **Itinerary 2 Wart Hill and Hopesay Common**

John Moseley

This excursion examines the diversity, structure and stratigraphy of the Precambrian Uriconian Volcanic Group that forms Wart Hill, and the relationship as a fault-bounded inlier within the Church Stretton Fault System to the slightly younger Precambrian sandstones of the Longmyndian Supergroup.

**Start Point** access point to Wart Hill SO 401 845

#### **Itinerary 3 Caer Caradoc**

Peter Toghil

This excursion studies the Uriconian Volcanics of the Caer Caradoc area, the adjacent Ordovician sediments laid down during the Caradoc epoch and the local development of the Church Stretton Fault System.

**Start Point** Willstone SO 492 953

#### **Itinerary 4 The Stiperstones and East Shelve Inlier**

John Moseley

This itinerary examines the rocks of the Tremadocian to Lower Llandeilo Series of the Ordovician Period and their fault-bounded eastern margin with volcanic and sedimentary Precambrian rocks.

**Start Point** Car Park on the east side of the Stiperstones ridge SO 369 976



**Itinerary 5 Mortimer Forest**

Martin Allbutt

The standard Ludlovian sections.

**Start Point** SO 474 732

**Itinerary 6 Wenlock Edge and Corvedale**

Martin Allbutt

Mid Shelf Silurian stratigraphy.

**Start Point** SO 500 900

**Itinerary 7 Southwest Shropshire**

Martin Allbutt

Outer Shelf Silurian stratigraphy.

**7A Plowden Woods and Edgton**

**Start Point** SO 379 877

**7B Kempton and Bury Ditches**

**Start Point** SO 356 830

**Itinerary 8 The Wrekin area**

Christine Rayner

Classic unconformity of Cambrian on Late Precambrian; wide variety of Lower Palaeozoic sediments together with volcanics and igneous intrusions.

**Start Point** SJ 639 092

**Itinerary 9 Clee Hills**

John Moseley

Lower Devonian to Upper Carboniferous sedimentary sequence with major dolerite sill.

**Start Point** SO 585 898

**Itinerary 10 Bridgnorth**

Martin Allbutt

Permian Bridgnorth Sandstone.

**Start Point** SO 738 904

**GA Guide No. 45 Onny Valley, Shropshire, Geology Teaching Trail, 1992**

Peter Toghil

The Onny Valley, to the east of the Church Stretton Fault complex, provides a classic and famous section through the Caradoc Series and along it are exposed all the characteristic rocks varieties containing their well-known shelly faunas. The trail guide is meant to appeal to students, undergraduates, as well as amateur geologists. The general public will find something to interest them too, as the trail follows a beautiful wooded valley, with plenty of wildlife to see.

**Cost:** Members Price: £2.00, Non-Members Price: £3.00

[www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

The itinerary along the Onny Valley is 1.57km long and goes through the village of Cheney Longville, on a narrow surfaced road

**Start Point** SO 430 844

**HEREFORD & WORCESTER EARTH HERITAGE TRUST**

[www.earthheritagetrust.org/](http://www.earthheritagetrust.org/)

**'Explore' Trail Guides**

**Cost:** £1.95 each or £ 30 for the full set of 21. Available on line:

### **Abberley Village Churches Building Stones & Geology Trail**

A short, pleasant walk links the two Abberley churches. This trail explains the building stones used in the Norman church of St Michael, which is built on Saxon foundations, and the 150 year old church of St Mary. The trail takes approximately one and a quarter hours to complete.

### **Abberley Hill Landscape & Geology Trail**

The Abberley Hills provide some wonderful scenery and viewpoints in north-west Worcestershire. This guide describes the landscape and explains its origins and takes you on a walking trail largely along the Worcestershire Way. The Way is a long-distance footpath that passes many old workings where the rocks have been quarried in the past for roadstone or building stone. This trail takes two to three hours to complete.

### **Bewdley Town Centre Building Stones & Geology Trail**

This walking trail shows how the location of Bewdley has been influenced by the underlying rocks and the River Severn. You will see that a major break in the Earth's crust runs right through the centre of the town and you will learn about the evolution of the river since the Ice Age. The trail takes you to buildings where stones of various types and origins have been used in construction; stones that were once molten rock or were formed in tropical seas millions of years ago. The trail takes approximately one hour to complete.

### **Bredon Hill Landscape & Geology Trail**

Bredon Hill, imposing and slab-like, stands sentinel above the valley of the River Avon in south Worcestershire. This trail will show how geology and the forces of nature have moulded the hill, how they help explain the glorious views and how they are responsible for a number of curiosities for which the hill is famous. At the highest point there are good picnicking sites. This is a circular walking trail of 5 miles, which takes four to five hours to complete.

### **Broadway Building Stones Building Stones Trail**

A gentle walk through this picturesque Cotswold village looking at the building stones and the origin of the warm creamy Jurassic limestones of the area. There is an optional walk to the top of the escarpment. This trail takes one and a half hours around the village with the more strenuous trail to the top of the hill and back taking another two hours.

### **Byton and Kinsham Landscape & Geology Trail**

The geological history of Herefordshire is written in the landscape. It has not always been as you see today. Once this area was covered by a warm tropical sea. More recently the land was covered by ice. This trail tells how these conditions have formed the landscape that you will see on this trail and how the River Lugg had to cut itself a new route after its course was blocked by ice in the Ice Age. The maximum distance walked is approximately 6 miles. If this is too strenuous it can be done in sections.

### **Clent Hills Landscape & Geology Trail**

The Clent Hills stand proud and distinctive in the west Midlands landscape and provide excellent views over the surrounding area. The ancient rocks that underlie the Hills were formed on a dry tropical landmass and this trail tells the story of their formation. The circular walk takes approximately two and a half hours to complete.

### **Goodrich Castle Building Stones Trail**

This red sandstone castle is situated on a rock outcrop high above the River Wye. Rock has been quarried from the moat below to provide some of the building stone for the castle. At first glance it may seem as if the whole castle is built of red sandstone. However, as you walk around the trail you will see the variations in types and colours of the sandstones used. Following the trail you will discover how sandstone is formed and how it changes when weathered. This trail takes two to three hours to complete.

### **Great Malvern Building Stones Building Stones Trail**

Great Malvern is characterised by the presence of the local Malvern rock. However it is also possible to

see a number of other rock types used as building material. This guide aims to introduce the visitor to aspects of geology through the use of building stones, both local and far-travelled. In addition, the trail illuminates the connection between the development of the town on this site because of its geographical location and the natural resources of water and stone. This trail takes approximately one hour to complete.

### **[Hampton Bishop Geology, River & Landscape trail](#)**

This fascinating trail follows the rivers Wye and Lugg along the line of the flood defence barrier, built after the disastrous floods in 1960, known locally as 'The Stank'. It looks at the river, how man has influenced it and how the area is affected by floods. This is a walking trail which takes approximately three hours to complete. Do not travel this trail during times of flood.

### **[Hereford Cathedral Building Stones Trail](#)**

There has been worship on the site of Hereford Cathedral for well over 1200 years. At different times the priority has been for local stone, such as the Caplar stone (from Caplar quarry near Howe Caple) used in the original building phase, or for a more ornamental stone, as in the Staffordshire Hollington Stone used by Oldrid Scott in his restoration of the west face. This trail takes one to two hours to complete.

### **[Hereford City Centre Building Stones Trail](#)**

The city of Hereford nestles in the Wye Valley amid open countryside. There is an interesting mix of buildings, from mediaeval lath and plaster dwellings, to Georgian brick houses and stone public, commercial and religious buildings. A variety of building and facing stones have been used that are prized for their beauty, some local and some from as far away as Italy, Finland and Norway. This trail includes a remaining section of the mediaeval walls which formed a semi-circle around the town. This trail takes approximately two hours to complete.

### **[Kington and Hergest Landscape & Geology Trail](#)**

This trail looks at the geology and landscape in the area of Kington. There is a short trail around Kington itself and a long trail which goes up onto Hergest Ridge. Fossils can be found in Silurian rocks which formed in tropical seas. There is also clear evidence of the effects of the Ice Age. There are magnificent views across Herefordshire and into Wales from Hergest Ridge, where the topography reflects the underlying rock structure.

The short trail takes approximately 1.5 hours and the long trail approximately 5 hours.

### **[Lickey Hills Landscape & Geology Trail](#)**

This circular walk guides you through four of the different rock types which makes up Lickey Hill. You will walk over heathland, through woodland and conifer plantations, and see panoramic views on a clear day. On this trail are several different types of sedimentary rocks, ranging in age from 488 to 251 million years old; these rocks reveal the nature of the environment at the time they were formed. This trail is 3 miles long, and takes approximately three hours to complete.

### **[Malvern Hills Landscape & Geology Trail](#)**

The rocks of the Malvern Hills form a natural boundary between Worcestershire and Herefordshire. This guide illustrates and explains the landscape that you can see whilst walking around Midsummer Hill, situated near the southern end of the Malverns. It tells a tale of deep Earth processes, tropical seas, deserts and ice ages.

This trail takes about two hours.

### **[Queenswood and Bodenham Landscape & Geology trail](#)**

This trail looks at the history, on a time scale of thousands of years, of the deep valley of the River Lugg as it swings in a loop round Dinmore Hill in the Bodenham area, and also looks at the rocks through which the Lugg cuts, which were laid down by rivers about 400 million years ago. The trail is in two sections (1.5 miles and 2.5 miles). The whole takes approximately five hours to complete.

### **[Ross-on-Wye Landscape & Geology Trail](#)**

This trail looks at the River Wye in the Ross-on-Wye area, a valley which is an abandoned former course of the river, the river terrace at Wilton, Old Red Sandstone rocks of the area and the use that has been made of them in building the town. This is a trail of 3 miles.

### **Woolhope Dome Landscape & Geology Trail**

The Woolhope Dome is an area of hills to the east and south-east of Hereford. On reaching Mordiford the hills rise abruptly from the flood plain of the rivers Lugg and Wye to Bagpiper's Tump near the village. Their impressive appearance can be seen on almost any approach to the area but it belies the more gentle landscape beyond. This driving trail is approximately 10 miles long and will take three to four hours to complete.

### **Worcester Cathedral Building Stones Trail**

This trail is an introduction to time travel through the geological periods in the magnificent setting of Worcester Cathedral. The cathedral has been the subject of several phases of construction and restoration. As you walk around you will see that different architects have used a diverse range of building stones in their work. This guide identifies and explains the origin of some of these stones. This building stones trail takes two to three hours to complete.

### **Worcester City Centre Building Stones Trail**

The trail starts and finishes at the Guildhall, on the High Street. This elegant eighteenth century building is one of the finest Guildhalls of its type in the country and is a harmonious blend of brick and natural stone. The examples of building stone, which are described in the guide, have been selected to illustrate both local types, usually found in the oldest buildings and more exotic rocks which became available later. The trail follows a circular route and takes about one and a half hours to complete.

### **Wyche and Purlieu Geology & Landscape Trail**

This walking trail covers a diverse range of landscape and geology features. The visitor will take in views across the relatively flat Severn Plain and compare them with views across the rolling limestone hills of eastern Herefordshire. The visitor will also walk over some of the oldest rocks in the British Isles, before descending through terrain that once graced the bottom of a warm shallow sea. The route follows part of an old salt way, a pack horse track used for transporting salt from Droitwich. The track ran from the Rhydd Ferry on the River Severn, across the Malvern Hills at the Old Wyche Road, down The Purlieu and on to Bosbury. This trail takes approximately two hours to complete.

### **Geopark Way**

A Geopark Way Trail Guide together with a Geopark Geology Map, presented in a clear plastic protective sleeve is available or the *The Abberley and Malvern Hills Geopark Geology map* can be purchased separately. ('Special Edition', purpose-made by the British Geological Survey)

### **Geopark Way Circular Trails leaflets**

#### **'Mathon and the Malvern Hills' geology and landscape trail (free)**

This 9 mile trail begins with a walk over the Precambrian rocks of the Malvern Hills before heading west down to West Malvern. From here the path continues westwards across ridge and vale topography created by the underlying Silurian rocks. Upon reaching Mathon the trail turns south-west, revealing evidence of the long gone River Mathon. The trail visits former hard rock aggregate quarries on the Malvern Hills, as also on the hills around Mathon; these feature along with the sand and gravel pits in Mathon parish.

#### **'Alfrick and the Suckley Hills' geology and landscape trail (pdf from website)**

This 5 mile trail begins on ground underlain by Triassic rocks before climbing Crews Hill onto the Silurian aged rocks of the Suckley Hills. The trail then traverses a variety of sedimentary rock types, all of Silurian age, on its way towards and through the Knapp and Papermill Nature Reserve. From the reserve the route recrosses Triassic rocks as its return to Alfrick church. The trail visits the former aggregate sites on the Suckley Hills ridgeline and also explores evidence of the aggregate quarries in the Knapp and Papermill nature reserve.

### **'Martley' geology and landscape trail (pdf from website)**

This 6 mile walking trail takes you through the contrasting landscapes of the rural Worcestershire parish of Martley. The trail begins on ground underlain by Triassic sandstones before passing onto Silurian aged rocks in the hamlet of Kingswood. From here, the route traverses a variety of Silurian-aged rocks on its way up and over Pudford and Rodge Hills. Descending Rodge Hill and travelling east, the trail revisits Triassic rocks before encountering a 'Fossil Hunt' around Penny Hill. The final section of the trail follows a pleasant route back to St Peter's church. In places, this route skirts around a line of former limestone aggregate quarries.

### **SHEFFIELD AREA GEOLOGICAL TRUST**

[www.geologyatsheffield.co.uk/sagt/building\\_stone\\_walk/](http://www.geologyatsheffield.co.uk/sagt/building_stone_walk/)

#### **The building stones of Sheffield - a geological walk in the city centre**

Peter Kennett, Sheffield Building Stones Group, 1999

The sturdy laminated A3 card guide provides a self-guided tour of the new building stones of the Peace Gardens and of the pavings in Fargate, as well as descriptions of many of the shop fronts, new and old, encountered on the way. The route is only a few hundred metres in length and much of it is free of traffic. A wide range of rocks from all over the world has been used and their characteristics are described, including the ways in which some are weathering, not least the gypsum tomb of the Earl of Shrewsbury outside the Cathedral, which seems to be dissolving whilst you look at it!

**Start Point** Peace Gardens, Town Hall, Norfolk Street SK 353 871

**Cost** can be downloaded in pdf format free at [www.geologyatsheffield.co.uk/sagt/building\\_stone\\_walk/](http://www.geologyatsheffield.co.uk/sagt/building_stone_walk/) or is available from SAGT.

### **SHEFFIELD GENERAL CEMETERY TRUST**

<http://gencem.org>

#### **Rock in the Sheffield General Cemetery**

Peter Kennett,

The folded A3 leaflet describes the 29 stones set in a spiral in the Memorial Garden within the cemetery. It was designed by Adrian Hallam and Nigel Dunnett. There are 9 different rock-types and each is described in turn.

**Start point** The Gatehouse, Sheffield General Cemetery SK 340 059

**Cost** free from the Cemetery or through the Earth Science Teachers' Association (no direct link found) <http://gencem.org>

### **SHROPSHIRE GEOLOGICAL SOCIETY**

<http://www.shropshiregeology.org.uk/SGS/SGSintro.html>

Contact re Publications: Andrew Jenkinson

Email: [andrew@scenesetters.co.uk](mailto:andrew@scenesetters.co.uk)

Comprehensive publications list on SGS website

[www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm](http://www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm)

#### **Shaping the landscape: a self-guided walk around Ludlow in Shropshire, 2014**

Mike Rosenbaum

An RGS-IGB Discovering Britain Guide with supporting maps, photographs and audio files, focussing on the Devensian glaciers which almost reached the outskirts of Ludlow.

**Start Point** Whitcliffe Common toposcope at SO 500 740

**Cost** PDF download free with a link to follow the virtual walk:

[www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm](http://www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm)

#### **A little mountain with many secrets: Discover The Wrekin in Shropshire, 2013**

G. Evans

An RGS-IGB Discovering Britain Guide with supporting maps, photographs and audio files.

**Start Point** car park by motorway at SJ 646 103

**Cost** PDF download free with a link to follow the virtual walk:

[www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm](http://www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm)

**Wonder as you Wander: From a Big Squeeze to a Big Freeze - a walk up Carding Mill Valley, near Church Stretton, 2012**

Shropshire Geological Society

**Start Point** from the National Trust shop at SO 443 945

**Cost** PDF download free: [www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm](http://www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm)

**Walls of Shells and Sand: wonder as you wander past Much Wenlock's stone buildings, 2012.**

Shropshire Geological Society

**Start Point** centre of Much Wenlock at SO 623 999

**Cost:** PDF download free: [www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm](http://www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm)

**Wonder as you Wander around the site of The Bog lead mine, 2012**

Shropshire Geological Society

**Start Point** the Bog Centre at SO 350 970

**Cost** PDF download free: [www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm](http://www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm)

**Walk through the past for a healthy future: Alveley & Severn Valley Country Park, 2009**

Shropshire Geological Society and Herefordshire & Worcestershire Earth Heritage Trust

Leaflet describing the Geopark Health Walk associated with the Geopark Way supported by the DEFRA Aggregates Levy Sustainability Fund.

**Start Point** Alveley Country Park car park at SO 753 839

**Cost** £2.95+p&p available from [andrew@scenesetters.co.uk](mailto:andrew@scenesetters.co.uk) at [www.scenesetters.co.uk](http://www.scenesetters.co.uk)

**Walk through the past for a healthy future: Bridgnorth, 2009**

Shropshire Geological Society and Herefordshire & Worcestershire Earth Heritage Trust

Leaflet describing the Geopark Health Walk associated with the Geopark Way supported by the DEFRA Aggregates Levy Sustainability Fund.

**Start Point** Bridgnorth Library at SO 710 930

**Cost** £2.95+p&p available from [andrew@scenesetters.co.uk](mailto:andrew@scenesetters.co.uk) at [www.scenesetters.co.uk](http://www.scenesetters.co.uk)

**The Geopark Way: a 109 mile walking trail through the Abberley and Malvern Hills Geopark, 2009.**

A. Jenkinson (Editor)

Herefordshire & Worcestershire Earth Heritage Trust.

**Start Point** see detailed itineraries under Herefordshire & Worcestershire EHT above

The start point in Shropshire is at Bridgnorth Castle: SO 717 982

**Cost** £1.95 each or £ 30 for the full set of 21. Available on line:

[www.earthheritagetrust.org/pub/category/publications/explore-trail-guides](http://www.earthheritagetrust.org/pub/category/publications/explore-trail-guides)

**Ludlow's Medieval Town Walls, 2009**

Ludlow Historical Research Group

Walking Trail with a geological bias.

**Start Point** Market Square, Ludlow, at SO 510 746

**Cost** PDF download free: [www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm](http://www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm)

**Rocks Make the Landscape: Haughmond Hill, 2009**

Shropshire Geological Society

GeoTrail supported by the DEFRA Aggregates Levy Sustainability Fund. Bardonia Aggregates in collaboration with the Shropshire Geological Society.

**Start Point** Haughmond Hill visitor's car park at SJ 546 147

**Cost** £2.95+p&p available from [andrew@scenesetters.co.uk](mailto:andrew@scenesetters.co.uk) at [www.scenesetters.co.uk](http://www.scenesetters.co.uk)

**Rocks Make the Landscape: Ironbridge Gorge, 2009**

Shropshire Geological Society

GeoTrail supported by the DEFRA Aggregates Levy Sustainability Fund.

**Start Point** Coalbrookdale car park at SJ 667 047

**Cost** £2.95+p&p available from [andrew@scenesetters.co.uk](mailto:andrew@scenesetters.co.uk) at [www.scenesetters.co.uk](http://www.scenesetters.co.uk)

**Rocks Make the Landscape: Lyth Hill and Sharpstone, 2007**

Shropshire Geological Society

GeoTrail supported by the DEFRA Aggregates Levy Sustainability Fund.

**Start Point** Lyth Hill car park at SJ 473 069

**Cost** £2.95+p&p available from [andrew@scenesetters.co.uk](mailto:andrew@scenesetters.co.uk) at [www.scenesetters.co.uk](http://www.scenesetters.co.uk)

**Rocks Make the Landscape: Llanymynech Hills, 2007**

Shropshire Geological Society

GeoTrail supported by the DEFRA Aggregates Levy Sustainability Fund.

**Start Point** Llanymynech by the canal at SJ 266 209

**Cost** £2.95+p&p available from [andrew@scenesetters.co.uk](mailto:andrew@scenesetters.co.uk) at [www.scenesetters.co.uk](http://www.scenesetters.co.uk)

**Rocks Make the Landscape: Severn Valley: Bridgnorth to Highley, 2007**

Shropshire Geological Society

GeoTrail supported by the DEFRA Aggregates Levy Sustainability Fund.

**Start Point** Bridgnorth Castle at SO 717 982

**Cost** £2.95+p&p available from [andrew@scenesetters.co.uk](mailto:andrew@scenesetters.co.uk) at [www.scenesetters.co.uk](http://www.scenesetters.co.uk)

**Rocks Make the Landscape: Titterstone Clee and Clee Hill, 2007**

Shropshire Geological Society

GeoTrail supported by the DEFRA Aggregates Levy Sustainability Fund.

**Start Point** Clee Hill village car park at SO 595 753

**Cost** £2.95+p&p available from [andrew@scenesetters.co.uk](mailto:andrew@scenesetters.co.uk) at [www.scenesetters.co.uk](http://www.scenesetters.co.uk)

**Rocks Make the Landscape: Around the Wrekin, 2007**

Shropshire Geological Society

GeoTrail supported by the DEFRA Aggregates Levy Sustainability Fund.

**Start Point** Forest Glen car park at SJ 638 093

**Cost** £2.95+p&p available from [andrew@scenesetters.co.uk](mailto:andrew@scenesetters.co.uk) at [www.scenesetters.co.uk](http://www.scenesetters.co.uk)

**An illustrated guide to the wonderful landscapes and geology of the Church Stretton area, 2008. K.**

Hotchkiss

Two walking trails and two car/cycle trails, published by Scenesetters on behalf of the Shropshire Geological Society

**Start Point** New House Farm on the outskirts of Church Stretton at SO 467 942

**Cost** £3.95+p&p available from [andrew@scenesetters.co.uk](mailto:andrew@scenesetters.co.uk) at [www.scenesetters.co.uk](http://www.scenesetters.co.uk)

**Teme Bank Trail, Ludlow, 2007**

E. Etheridge, D. Lockett & M.S Rosenbaum

An extensively revised leaflet written and produced by Shropshire County Museum Service, Shropshire Wildlife Trust and Shropshire Geological Society based on the concept of the leaflet produced by Kate Andrew in 2002.

**Start Point** below the Castle walls at SO 508 747

**Cost** PDF download free: [www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm](http://www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm)

**A Geological Trail around Hawkstone Park, 2007**

C. Rayner

**Start Point** Hawkstone Follies visitors car park at SJ 570 280

**Cost** PDF download free: [www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm](http://www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm)

**Be a Rock Detective around Hawkstone Park, 2007**

C. Rayner

**Start Point** Hawkstone Follies visitors car park at SJ 570 280

**Cost:** PDF download free: [www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm](http://www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm)

**A Geological Trail in front of the last glacier in South Shropshire, 2007**

M.S Rosenbaum

**Start Point** East Hamlet, Ludlow, at SO 515 754

**Cost** PDF download free: [www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm](http://www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm)

**The building stones of Ludlow: a walk through the town, 2007**

M.S Rosenbaum

**Start Point** below the Castle walls at SO 507 745

**Cost** PDF download free: [www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm](http://www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm)

**Geological Trail for Titterstone Cleve and Cleve Hill, 2005**

M.S. Rosenbaum & W.B. Wilkinson

**Start Point** Cleve Hill village car park at SO 595 753

**Cost:** PDF download free: [www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm](http://www.shropshiregeology.org.uk/SGSpublications/Table%20of%20Contents%20for%20Trail%20Guides.htm)

**GeoTrails Project: Titterstone Cleve, 2005**

**Shropshire Geological Society**

**Start Point** Cleve Hill village car park at SO 595 753

**Cost** £2.95+p&p available from [andrew@scenesetters.co.uk](mailto:andrew@scenesetters.co.uk) at [www.scenesetters.co.uk](http://www.scenesetters.co.uk)

**Rocks Make the Landscape: Wenlock Edge, 2005**

**Shropshire Geological Society**

**Start Point** National Trust car park at SO 614 996

**Cost** £2.95+p&p available from [andrew@scenesetters.co.uk](mailto:andrew@scenesetters.co.uk) at [www.scenesetters.co.uk](http://www.scenesetters.co.uk)

**GeoTrails Project: Wenlock Edge, 2005**

Shropshire Geological Society

**Start Point** National Trust car park at SO 614 996

**Cost** £15 plus p&p leaflet, printed booklet or in digital form on CD available from [andrew@scenesetters.co.uk](mailto:andrew@scenesetters.co.uk) at [www.scenesetters.co.uk](http://www.scenesetters.co.uk)

**Severn Valley Railway, 2002**

R. Thornhill

Leaflet published by Herefordshire and Worcestershire RIGS Group

**Start Point** Kidderminster SVR station at SO 838 763

**Cost** £3.95 plus p&p available from [www.earthheritagetrust.org/pub/shop/trail-guides-shop/trail-guides](http://www.earthheritagetrust.org/pub/shop/trail-guides-shop/trail-guides)

**Wigmore glacial lake, 2001**

R. Thornhill

Leaflet published by Herefordshire and Worcestershire RIGS Group

**Start Point** Wigmore village car park (400 m east of the centre of the village) at SO 415 690

**Cost** £3.95 plus p&p available from [www.earthheritagetrust.org/pub/shop/trail-guides-shop/trail-guides](http://www.earthheritagetrust.org/pub/shop/trail-guides-shop/trail-guides)

**Mortimer Forest Geology Trail, 2000**

Jenkinson, A.

Published in association with the Forestry Commission (West Midlands Forest Division) and Scenesetters

**Start Point** High Vinnals car park at SO 474 732

**Cost** £3.95 plus p&p available from [andrew@scenesetters.co.uk](mailto:andrew@scenesetters.co.uk) at [www.scenesetters.co.uk](http://www.scenesetters.co.uk)



## TEME VALLEY GEOLOGICAL SOCIETY

[www.geo-village.eu](http://www.geo-village.eu)

Contact re Publications: John Nicklin

Email: [martleypfo@gmail.com](mailto:martleypfo@gmail.com)

### **1 Geopark Way, Circular Trail, 2009**

TVGS

A 6 mile circular geology and landscape trail

**Start point** Car Park behind the Church SO 37561 25965

**Cost** Free (but donations always welcomed!) [www.geo-village.eu/?page\\_id=1637](http://www.geo-village.eu/?page_id=1637)

### **2 Martley Geology Trail 2, 2012**

TVGS

A three mile stroll around local geological features

**Start point** The Old Weighbridge SO 37536 25997

**Cost** Free (but donations always welcomed!) [www.geo-village.eu/?page\\_id=1591](http://www.geo-village.eu/?page_id=1591)

### **3 Martley Geology Trail 3, 2012**

TVGS

A fairly strenuous walk through beautiful scenery, visiting some of Martley's geological formations.

**Start point** The Old Weighbridge SO 37536 25997

**Cost** Free (but donations always welcomed!) [www.geo-village.eu/?page\\_id=1644](http://www.geo-village.eu/?page_id=1644)

## WARWICKSHIRE GEOLOGICAL CONSERVATION GROUP

[www.wgcg.co.uk](http://www.wgcg.co.uk)

### **Royal Leamington Spa: its geology and building stones**

A guided walk, 1.5 km long, through the centre of Leamington to see the fascinating array of stones that have been used in buildings historic and modern

**Start point** George House, Clarendon Avenue SP 317 662

**Cost:** free on website: [www.wgcg.co.uk/leaflets/](http://www.wgcg.co.uk/leaflets/)

# REGION 11: WALES

## GEOLOGISTS' ASSOCIATION

[www.geologistsassociation.org.uk](http://www.geologistsassociation.org.uk)

Guides Editor: Susan Marriott

### GA Guide No. 40 Anglesey, 1981

D.E.B.Bates & J.R.Davies

Anglesey contains a fascinating variety of rock types and geological structures, best exposed in a magnificent coastline 'Hard rock' and structural geology interests are catered for in Precambrian and Ordovician areas, palaeontology in the Ordovician and Carboniferous and sedimentology in all the systems. The ten itineraries are roughly in stratigraphical order but each itinerary covers a particular area.

**Cost:** Members Price: £2.00, Non-Members Price: £3.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

#### Itinerary 1 Holy Head

**Start Point** Car Park at South Stack SH 206 822

#### Itinerary 2 Central West Anglesey

**Start Point** Gwynydy on the B 5109, 10 km NW of Llangefni SH 394 793

#### Itinerary 3 Southern Anglesey

**Start Point** Llanfairpullgwyngyll, below the Marquis of Anglesey's Column on N side of the A5 SH 535 715

#### Itinerary 4 Carmel Head

**Start Point** Park large vehicles near Llanfairynghornwy church (SH 326 908) and walk the 4 km to the old copper mines at Penbrynreglwys SH 296 927

#### Itinerary 5 Cemaes Bay to Porth Wen

**Start Point** Car park at the eastern end of Cemaes Beach SH 375 938

#### Itinerary 6 Dulas Bay to Point Lynas

**Start Point** various points of access to Dulas Bay including the minor road at SH 418 887

#### Itinerary 7 The Ordovician rock of Central Anglesey

**Start Point** Llanerchymedd – old quarry belonging to Tyddyn Farm, on north side of the road west of Bachau SH 427 839

#### Itinerary 8 Parys Mountain

Copper mines dating back to the Romans and in the early 19<sup>th</sup> C was the site of the most important copper mines in Europe, finally closing before the First World War.

**Start Point** road junction on B 5111 SH 433 900, then on foot to southern slopes of the mountain at SH 438 898

## **Itinerary 9 The Old Red Sandstone**

**Start Point** roadside exposure at Mynydd Bodafon SH 4740 8532

## **Itinerary 10 Lower Carboniferous of the coast from Lligwy Bay to Red Wharf Bay**

**Start Point** south side of Lligwy Bay at Carreg Ddafed from Lligwy Beach SH 496 871

## **GA Guide No. 54 The Aberystwyth District, 1995**

compiled by M.R.Dobson

The Aberystwyth Grits and Borth Mudstones (Silurian) are magnificently exposed in accessible cliffs along the coastline of Cardigan Bay and are world-famous as classic examples of turbidity current deposition. But the region is also known for the variety of its glacial landforms and modern sedimentary environments. Nineteen itineraries are described in detail, the first eight dealing with the variations in the turbidite fan succession between New Quay in the south and Harp Rock in the north. The rest cover the Dovey Estuary, the Quaternary and solid geology of Cardigan Bay and the Plynlimon area.

**Cost:** Members Price: £9.00, Non-Members Price: £12.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

**Itinerary 1 New Quay** Proximal turbidites, amalgamated beds, sedimentary dykes and sills.

**Start Point** SN 3868 6044

**Itinerary 2 Cei Bach to Gilfach** Coastal geomorphology, amalgamated beds, washouts and sole markings.

**Start Point** SN 415 600

**Itinerary 3 Aberarth to Morfa** Coastal geomorphology, slumped bedding, lobe progradation and sole markings.

**Start Point** SN 480 642

**Itinerary 4 Monk's Cave** Coastal geomorphology, glacial deposits, thick bedded sandstones and washouts.

**Start Point** SN 555 745

**Itinerary 5 Aberystwyth to Clarach** Classic Aberystwth Grits Formation: distal turbidites, sole markings and lateral correlation.

**Start Point** SN 583 825

**Itinerary 6 Clarach to Wallog** Slumped beds, ripple drift bedding, correlation across folds and faults, folding and cleavage, graptolites.

**Start Point** SN 586 841

**Itinerary 7 Wallog to Harp Rock** Distal facies, sole markings, regular banding, amalgamated beds, internal rippling and graptolites.

**Start Point** SN 590 857

**Itinerary 8 Borth to Harp Rock** Very distal basin plain mudstones, trace fossils and quartz veining.

**Start Point** SN 6073 8887

**Itinerary 9 Dovey Estuary** Tidal flats, fauna, flora, sedimentation and fossil forest.

**Start Point** SN 654 929

**Itinerary 10 Ynyslas Foreshore** Fossil forest, sand and shingle spit, dune field and shells.

**Start Point** SN 607 925

**Itinerary 11 Dovey / Dyfi Valley** start at Mallwyd Late Pleistocene and Holocene sediments and landforms.

**Start Point** SN 860 125

**Itinerary 12 Tonfanau** Quaternary erratics and Cardigan Bay geology, Ordovician volcanism, Tonfanau Quarry: volcanics and intrusion.

**Start Point** SH 564 038

**Itinerary 13 Bird Rock and Castell y Bere** and SH 66770856 Ordovician Caradoc volcanism.

**Start Point** SH 6436 0686

**Itinerary 14 Llwyngwriil** Cambrian stratigraphy, igneous intrusions and minerals.

**Start Point** SH 5994 1107

**Itinerary 15 A Nant y Moch** Ordovician, glacial topography, engineering and mining, graptolites.

**Start Point** SN 763 864

**Itinerary 15 B Carn Owen** Uppermost Ordovician, folding, faulting and mineralisation.

**Start Point** SN 7362 8854

**Itinerary 15 C Rheidol Gorge** spectacular geology, glaciation, graptolites, lead mining and gigantic pot holes.

**Start Point** SN 7467 8055

**Itinerary 15 D Devil's Bridge** Narrow gorge cut in Pleistocene.

**Start Point** SN 7415 7703

**Itinerary 16 Ystwyth Area** Ystwyth inlier, sandstone lobes, graptolites, Tertiary drainage patterns.

**Start Point** SN 930 650

**Itinerary 17 Hendre Quarry** A working quarry, need permission to access this. A minor lobe of basinal arenaceous turbidites.

**Start Point** SN 721 690

**Itinerary 18 Cwmystwyth and Eaglebrook Mines** Minerals and mineralisation.

**Start Point** SN 740 890

**Itinerary 19 Cwmystwyth Area** Silurian stratigraphy, high matrix turbidites.

**Start Point** SN 789 741

## **GA Guide No. 69 The Roadside Geology of Wales, 2011**

Jim Talbot and John Cosgrove

This guide book is written for those who have little background knowledge of geology. It focuses on the geology of Wales that can be seen from a car and the descriptions are organized in relation to the main

roads. The best outcrops are in the sea cliffs and on beaches and these are also described where they are easily accessible from a main road. Many examples of geological activity are illustrated along the roads and cliffs of Wales including basin sedimentation and volcanic activity. The effects of plate tectonics in opening basins and folding and metamorphosing the rocks in two major continental collisions are recorded in the Welsh Mountains.

**Cost:** Members Price: £14.00, Non-Members Price: £17.00 [www.geologistsassociation.org.uk/guidesales.html](http://www.geologistsassociation.org.uk/guidesales.html)

## **Gwynedd North West Wales**

### **Anglesey**

#### **Itinerary 1 A5/A55 Menai Bridge to Holyhead 20 miles**

Visiting the Marquis of Anglesey and his blue schist one of the world's rare rocks, possibly the oldest in the world, a signature of high pressure low temperature metamorphism marking the site of a Cambrian subduction zone. Excellent Precambrian granites and interesting glacially sculpted landscapes abound.

**Start point** Menai Bridge SH 555 720

#### **Itinerary 2 Southwest Coast Road on the A4080 Menai Bridge to Rhosneigr 23 miles**

Carboniferous Limestone, deposited over the Precambrian basement peneplain, forms flat farmland. See pillow lavas and magnificent sand dunes. The road crosses a major melt water channel which exposes fine Precambrian rocks which have suffered greatly. Find evidence for the Caledonian and Variscan Orogenies and thus continental collision.

**Start point** Menain Bridge SH 555 720

#### **Itinerary 3 Holy Island to Beaumaris on the A5025 33 miles**

Spectacular tight, accordion-like folds in Precambrian schists support the lighthouse and underlie much of Holy Island. On a clear day the Llyn Peninsula and Snowdonia's mountains can be seen. Much of Holy Island is metamorphosed volcanic ash, mudstone and shale but Holyhead mountain is sparkling quartzite. At Cemaes Bay, the spectacular Gwna Melange is exposed, the result of submarine landslides whilst the rocks were still soft. This road passes the Wylfa nuclear power station and the Parys mountain copper mines originally worked by the Romans. Experience the raised beach overlying Carboniferous Limestone with interesting dissolution features in the cliffs and a wave cut platform.

**Start Point** the car park at South Stack SH 202 823

### **Llyn Peninsula**

#### **Itinerary 1 Porthmadoc to Aberdaron: South coast A497/A499 and B4413 29 miles**

This itinerary is a tale of glacial cover and solid rock. A fine Ordovician sill, with columnar joints, supports Criccieth Castle, but the town of Criccieth sits dangerously on glacial till which needs support.

**Start point** Porthmadog SH 567 388

#### **Itinerary 2 Aberdaron to Caernarfon: North coast on the B4417 and A499 32 miles**

See Precambrian pillow lavas at the Lifeboat Station. Later volcanic history can be seen in the Ordovician volcanic rocks associated with the story of the closure of the Iapetus Ocean. Quarries in granites of Ordovician age can be seen from the road, on the mountain Yreifl. The itinerary finishes on the raised marine terrace into Caernarfon.

**Start point:** Aberdaron SH 172 264

### **Snowdonia**

#### **Itinerary 1 Circular route around Snowdonia: Conwy to Porthmadoc A55/A487/A470 89 miles**

Crossing Ordovician volcanic and intrusive rocks wonderfully exposed by the re-routing of the A55. Cambrian slates, including the largest slate quarries in Wales, are also visible and a wealth of glacial landscape features.

**Start point** Conwy SH 780 774

#### **Itinerary 2 The Snowdon Passes: Betws-y-Coed to Menai Bridge, The Nant Ffrancon A5 22 miles**

Follow Watling Street through the Ordovician outcrops and see the effect of glaciation on the more resistant volcanics.

**Start point** Betws-y-Coed SH 795 565

#### **Itinerary 3 The Pass of Llanberis: Capel Curig to Caernarfon A4086 23 miles**

Admire the glacial lakes preserved in Ordovician volcanics and a classic U-shaped valley with waterfalls from hanging valleys. Worth a visit, the Dinorwic hydro-electric power station which makes use of old Cambrian slate quarries.

**Start point** Capel Curig SH 721 581

**Itinerary 4 The Pass of Rhyd-Ddu: Caernarfon to Porthmadoc A4085/ A498** 19 miles

If you wish to climb Snowdon this is the route to choose. This a good opportunity to see the confluence of two glacial valleys at Beddgelert. Road cuttings show good exposures of the Snowdon Volcanic Group, rocks which filled the Snowdon caldera and you can also visit the old Sygun copper mine which shows how many metallic ore deposits were formed.

**Start point** Caernarfon SH 482 627

### **Harlech Dome**

**Itinerary 1 Dolgellau to Ffestiniog A470** 9 miles

A feast of Cambrian rocks whose hardness is reflected in the landscape.

**Start point** SH 728 178

**Itinerary 2 The Coast Road Dolgellau to Ffestiniog A496** 31 miles

See some of the finest exposures of the oldest sedimentary rocks of the Welsh basin, travel through 70 million years of Cambrian rock. These beds were deposited as turbidity currents poured off-shelf into the Welsh basin. Harlech Castle stands on the Rhinog grits formed from coarser facies of the turbidite sequence. This castle built by Edward I guards the water gate, one of his supply routes.

**Start point** Dolgellau SH 728 178

### **The Cadair Idris Range**

**Itinerary 1 Eastern Cadair Idris: Machynlleth to Dolgellau A487** 16 miles

Travel a forested gorge of Silurian slates and cross one the largest faults in Wales, the Bala fault in Ordovician slate and pick up changes in rock type in the walls and buildings.

**Start point** Machynlleth SH 745 008

**Itinerary 2 The Cadair Idris Coast Road: Dolgellau to Machynlleth A493** 34 miles

See the Dolgoch Falls, a series of cascades cutting into Ordovician slates. The Silurian slates showing steep cleavage in many road cuttings which have been used as roof slates, as have the Cambrian Ffestiniog flags.

**Start point** Dolgellau SH 728 178

## **Clwyd North East Wales**

**Itinerary 1 The A5: Shrewsbury to Betws-y-Coed** 61 miles

An excursion into the Palaeozoic. Westwards off the rich Permo-Trias farmland, into the Vale of Llangollen which exposes the Carboniferous Millstone Grit deltaic sandstones then the older, grey Carboniferous Limestone scarp and dark Silurian Slates, on which stands Castell Dinas Bran. These slates mark the compression of the region during the Caledonian Orogeny and they can be seen in large quarries and also are used in the local buildings. Conwy Falls tumble from a hanging glacial valley over the dark Silurian slates. The road follows the glacial valley with Ordovician volcanic on the west and the slates on the east.

**Start point** Shrewsbury SJ 487 096

**Itinerary 2 The A55: Chester to Conwy** 38 miles

A good opportunity to admire the red Permo-Trias, New Red Sandstone (NRS), which was quarried to build Chester. Passing from the Dee valley over the Clwydian range, Carboniferous Limestone blocks are scattered on the fields. Thick limestone layers mark the fault bounded Clwyd valley graben, part of the opening Atlantic story and the break-up of Pangaea. The contrast in agriculture clearly reflects the underlying geology. The coast road follows a wave-cut terrace caused by sea-level changes associated with the last glaciation. Conwy Castle exploits the local Carboniferous Limestone as its building material.

**Start point:** Chester SJ 425 642

**Itinerary 3 The A452/A525: Llangollen to Rhyl and the Vale of Clwyd** 35 miles

Cross over the folded dark Silurian slates and gently tilted Carboniferous Limestone, pass Valle Crucis Abbey where the slates show paper-thin sandstones with rippled surfaces, which emphasize an angular relationship. Slate quarries show interesting colour banding, in well cleaved, ideal roofing and billiard table material. A nearby area shows lead, zinc and silver mineralization of Variscan age, which has been worked from Roman times and produced one-eighth of Britain's lead during the Industrial Revolution. Sands derived from desert environments in NRS times provide material for the beaches. Glacial features can be detected and reddish colouration has stained the limestones. Above Prestatyn, a good view of the general landscape features is worth stopping for.

**Start point** Llangollen SJ 215 419

### **The Clywdian Range**

**Itinerary 1 The A494: Mold to Ruthin** 10 miles

Road cutting shows bladed and folded Silurian siltstones and slates overlain by Carboniferous limestone in angular unconformity. Millstone grit can be seen in the buildings.

**Start point** SJ 238 639

**Itinerary 2 The A451: Mold to Denbigh** (16 miles/26 km)

A feast of Carboniferous Limestone.

**Start point** Mold SJ 238 639

### **The Denbighshire Moors**

**Itinerary 1 The A548: Abergele to Llanwrst** 17 miles

3000 m of Silurian sediments, produced by submarine slides and turbidity currents underlie this sector of the Cambrian mountains; gentle easterly dips interrupted by some large folds are again topped with Carboniferous limestone in an angular unconformity. Glacial melt water channels incise these rocks, now showing tiny misfit streams.

**Start point** Abergele SH 945 785

**Itinerary 2 The A543: Denbigh to Pentrefoelas** (17 miles/27 km)

Small quarries expose finely banded turbidite sediments which show weak cleavage developed during the Devonian Acadian Orogeny

**Start point** Denbigh SJ 058 665

**Itinerary 3 The B5113 Colwyn Bay to Llanwrst** 19 miles

Here you cross one of the high Welsh plateaux originally a Permian erosional surface. Now deeply incised, it gives great panoramas of Snowdonia.

**Start point** Colwyn Bay

## **Central Wales The Palaeozoic Welsh basin**

### **The Coast Road**

**The A487: New Quay to Machynlleth** 39 miles

Track some of the finest exposures of Silurian turbidites, moving north into the Welsh Basin and losing bedload and energy, as mudstone deposition dominates the deeper part of the basin. The Caledonian Orogeny resulted in tilting and folding of these sediments, near vertical in places, and showing an angular unconformity with the overlying Irish Sea glacial till, a real mixed bag of a sediment. Trace fossils show evidence of life in Silurian times. Near journey's end the rocks show "concertina folds" and pervasive cleavage resulting from compression in the Caledonian Orogeny.

**Start point** New Quay SN 385 598

### **The Inland Roads**

**Itinerary 1 The A44: Kington to Aberystwyth** 61 miles

Silurian rocks intruded along faults by dolerite at the end of the Caledonian collision are valued for road aggregate. At Ponterwyd, visit mines exploited in the 19<sup>th</sup> century for zinc, silver and lead ores, the tips are worth picking over. Devil's Bridge, where glacial melt water cuts a deep gorge with fine pot holes in the Ordovician slates, is a place where graptolite fossils can be found.

**Start point:** Kington SO 302 568

**Itinerary 2 Mountain Road (B4574 in part) Devil's Bridge to Rhayader** 23 miles

An adventurous road over Silurian turbidites with good cleavage in fine sediments, passing Jubilee Arch (memories of George III), and scour waste heaps at Cwmwyswyth mine, which has been worked for zinc, lead and silver since the Bronze Age. Over the moors, you can see excellent views of the high Welsh plateau and work out the geological story.

**Start point** Devil's Bridge SN 738 769

**Itinerary 3 The A483: Builth Wells to Oswestry** 58 miles

A good opportunity to find "pencil" slate in the Silurian slates, good for building not for writing.

Overlook the Severn Valley plain and contrasting red Triassic rocks which were deposited in a down-faulted valley associated with the Atlantic opening.

**Start point** Builth Wells SO 040 510

**Itinerary 4 The A470: Brecon to Dolgellau** 104 miles

Here you cross the deepest part of the Welsh Basin with the longest record of Ordovician and Silurian sand and mud deposition, indicating off-shelf turbidite facies. In the south you meet the other red sandstone the Devonian, Old Red Sandstone (ORS), much is neither red nor sandstone; these are flood plain sediments formed when the Welsh Basin had finally filled. A broad anticline outlines Builth Wells and several large folds can be traced as you drive north, with Ordovician slates stained red by rusted pyrite in the original mudstone. Follow the river Wye as it jumps down steps formed of resistant sandstone forming little rapids. Near Cemmaes, sparse, poorly consolidated mud and silt outcrops means few stone boundaries and subdued landscapes. Rugged moors form on Ordovician volcanic rocks of the Cadair Idris group.

**Start point** Brecon SO 045 285

**Itinerary 5 The A470 and A4212: Ffestiniog to Bala** 26 miles

This route crosses Cambrian and Ordovician rocks, with few outcrops apart from masses of dark dolerite. Typical hummocky moraine left by Ice Age glaciers can also be seen. Horizontal volcanics are eroded to form the Arenig hills; crystals can be seen, as can columnar joints in places, these are ignimbrites. Towards Bala, landscape reverts to rolling grazing land.

**Start point** Ffestiniog SH 701 419

**Itinerary 6 The B4391: Bala to Llanfyllin** 28 miles

Here you cross the Berwyn mountains formed of Ordovician and Silurian turbidite rocks mostly covered by glacial debris. Road cuttings show some sandstone and shale clasts ripped up by successive turbidites. Ribs of Ordovician volcanic rocks stand proud on some slopes. Much of the southern part of this route shows subdued landscape.

**Start point** Bala SH 929 362

### **The Welsh Borderland**

**Itinerary 1 The 458: Shrewsbury to Welshpool** 18 miles

The Severn Valley is floored with Triassic mudstone. The road climbs onto Carboniferous sandstone soils and then back onto folded Ordovician and Silurian slates. You can find volcanic bombs at Middletown in the steeply dipping Ordovician volcanics, mostly of fine ash. Look out for the landscape contrasts here.

**Start point** Shrewsbury SJ 490 127

**Itinerary 2 The A490, A489 and A49: Welshpool to Church Stretton (Shropshire)** 27 miles

A classic geological area with rocks of Precambrian to Silurian ages and the tectonic and structural relationships are worth disentangling. A knob of dolerite forms a prominent hill at Churchstoke. Mining for lead and zinc and quarrying are an important part of the history of the area, with waste tips in abundance. Jagged teeth of the white quartzite Stiperstones stand proud on the skyline. They mark the position of a nearshore sand bar as Ordovician sea-level rose. You can recall the Pleistocene tundra landscape when looking at the stone stripes which stretch out on the slopes below. The Longmynd, a Precambrian mountain shows few outcrops, visit the car park west of Church Stretton to reveal these Longmyndian rocks. Make use of the National Trust car parks to see Silurian Wenlock limestone, the same age as the Welsh Basin, but showing rocks from a different environment, an ancient barrier reef.

**Start point** Welshpool SJ 225 074

### **Glamorgan and Gwent, Southeast Wales**

#### **The Forest of Dean and the Usk Valley**

**Itinerary 1 The A4136: Mitcheldean to Monmouth** 10 miles

Encounter a different scale of coal mining exploiting the Carboniferous Coal Measures, which with the Carboniferous Limestone, form the bedrocks under the Forest of Dean. The rim of the basin is formed from an ORS conglomerate, speckled with round white quartz pebbles and as the road drops down to the Wye Valley, the soil reddens as it crosses the less resistant ORS beds.

**Start point** Mitcheldean SO 665 183

**Itinerary 2 The A466: The Wye Valley, Monmouth to Chepstow** 16 miles

Follow the River Wye as it cuts down into the plateau of Carboniferous rocks, forming the boundary between England and Wales. The meandering river originally developed on a plain near sea level, incising to form the deep valley regardless of rock type as the plain rose. It crosses ORS rocks until, south of Tintern Abbey, cliffs have formed as the vertical joint pattern in the Carboniferous Limestone controls the way the rocks erode.

**Start point** Monmouth SO 510 130

**Itinerary 3 The A40 and A449: Monmouth to Newport** 25 miles



Here you cross the anticline which divides the synclinal South Wales Coalfield and Forest of Dean. Keeping an eye on the soil colours helps decide whether you are on the Silurian or Devonian rocks, as outcrops are rare.

**Start point** Monmouth SO 510 130

### **The South Wales Coalfield**

#### **Itinerary 1 The A470: Cardiff to Brecon 44 miles**

Crossing the South Wales Coalfield, the broad sweep of the Coal Measures rocks forms a basin, with roadside outcrops of Pennant Sandstone. Valleys also show the clear effects of the last glaciations, as well as relics of the great mining industry which exploited the Coal Measure rocks for both coal and iron. The north part of the route exposes Millstone Grit, cuts down into Carboniferous Limestone, then the underlying ORS and the Usk Valley. The ice sculpted Brecon Beacons National Park with its many road cuttings gave geophysical evidence that these ORS flash flood sandstones were deposited 20° south of the Equator.

**Start point** Cardiff ST 193 747

#### **Itinerary 2 The A4059 and A470: Hirwaun to Brecon 21 miles**

Rock outcrops appear gradually in road cuttings and as isolated blocks of Carboniferous Limestone which gives a fine opportunity to see the effects of acid rain at Porth-yr-Ogof caves. The overlying Millstone Grit scarp, with white quartz pebbles, shows clearly, with ribs of limestone below it. ORS forms the bedrock for the moors before the Brecon Beacons are seen, capped by more massive ORS sandstones.

**Start point:** Hirwaun SN 950 055

#### **Itinerary 3 The A465: Heads of the Valleys Road, Abergavenny to Swansea 44 miles**

An opportunity to reflect on the relics of the mining and steel industries, forged from the Carboniferous Coal Measures. Associated lower, thick, gently dipping, massive sandstones and shales, deposited from huge, fluvial deltas interleaved with marshy areas, are easily seen in road cuttings. West of Hirwaun, are more complex areas of faults and folds, the 'disturbances'. The Neath Disturbance is best seen near the Waterfalls Centre which tells the geological and cultural story of the area.

**Start point** Abergavenny SO 305 128

### **The Western Coalfields**

#### **Itinerary 1 The A4067 / A4109 and A40 : Swansea to Brecon 41 miles**

Across the Swansea valley, where towns cluster round old mines which exploited the Coal Measures. Travelling north, the rocks dip gently south, so you travel back in geological time until the white Millstone Grit caps the mountains to the north. An interesting diversion takes in the Henrhyd Waterfall, South Wales' highest, which drops over the 'Farewell Rock', the miners' name for the youngest Namurian sandstone below the lowest coal seam. Dan-yr-Ogaf caves mark the last of the Carboniferous Limestone, before the Devonian ORS gives the landscape a reddish hue and rippled surfaces indicate sandstones deposited on an ancient flood plain.

**Start point** Swansea SS 721 961

#### **Itinerary 2 The A4069: Llandovery to Brynamman 15 miles**

Good views of the landscape, outcrops of bedrock and the oldest rocks in the region, Ordovician slates of the Welsh Basin. The younger Devonian rocks are similar to the Silurian silts below, but the landscape changes as Black Mountain is reached; typical ORS moorland with gullies in glacial till and large sandstone boulders scattered across the surface. Use the car park to examine the top of the ORS with its magnificent white, vein-quartz pebbles set in a sandy matrix. Towards the top of the mountain, Carboniferous Limestone has been quarried.

**Start point** Llandovery SN 766 343

#### **Itinerary 3: The A483: Swansea to Llandeilo (26 miles/42 km)**

Crossing unproductive Coal Measures which produce a subdued landscape, a cutting through a south dipping ridge of Carboniferous Limestone indicates that here it is the north limb of the syncline. Pastureland towards Llandeilo is underlain by ORS and Silurian siltstones.

**Start point** Swansea SS 721 961

#### **Itinerary 4 The A40: Ross-on-Wye to Carmarthen 107 miles**

Skirting the South Wales Coalfield, the road cuttings show ORS coarse sands and conglomerates, deposited from fast flowing rivers across coastal plains. Grey cliffs at Symonds Yat expose Carboniferous Limestone tilting gently west. In Monmouth, colour difference shows where red

sandstones from the ORS, below the Carboniferous Limestone, are used in the buildings. Soils give clues to the underlying ORS where outcrops are absent.

**Start point** Ross-on-Wye SO 598 242

**Itinerary 5 Motorway geology, M48 and M4: Chepstow to Carmarthen** 90 miles

Motorways skirt the South Wales Coalfield, crossing ORS, Carboniferous Limestone, Triassic New Red Sandstone (NRS) and Jurassic rocks, often difficult to distinguish when flashing past at 70mph, as all contain limestones and sandstones and there are not many road cuttings. Generally, ORS shows thick, reddish-brown sandstones, whereas NRS has thinner, bright, orange-red beds. Carboniferous Limestone is blueish, 'battleship' grey, often in 1m or thicker beds, whereas Jurassic limestones tend to be thinner, 10 – 20cm layers in buff, yellow-brown.

**Start point** Chepstow ST 535 915

**The Glamorgan Coast south of the M4: Cardiff to Swansea**

**A48/B4232/B4265/B4247 Cardiff to Bridgend**

Here are sediments from fault-bounded, Triassic valleys with red mudstones, part of the NRS. The Triassic and Jurassic rocks are part of the story of the opening of the Atlantic Ocean, when warm seas flooded the basin, now traced by the Bristol Channel. Cliffs along the coast expose these rocks to good advantage. At Lavernock Point, see where Marconi made the first overwater radio transmission. Here alternate layers of thin limestones, separated by dark grey mudstones, are evidence of environmental, and climatic changes, dipping gently to the south and ageing to the north. Barry Island beach shows the unconformable relationship between the Carboniferous Limestone, folded in the Variscan Orogeny and the Triassic green and red mudstones, polygonal cracks are evidence of geological episodes of drying out, as happens today. Along the inland plain, quarries indicate the working of Carboniferous Limestone for road aggregate and an iron mine can be seen north of Cowbridge.

**Start point** Exit 33 M4, Lavernack Point ST 189 679

**The Gower**

**The Gower Peninsula: A4067 / A4118 / B4295**

A marine erosional plain, now at 100m above sea-level, cutting rocks of Devonian and Carboniferous age, folded during the Variscan Orogeny, and now clearly seen at Mumbles Head in the east and Rhossili in the west of the Gower. Another platform, about 7m above sea-level, probably resulted from changing sea-levels during Pleistocene times is clear at Three Cliffs Bay. Today, a third platform is developing on the modern foreshore. Look for cycles of shallowing and deepening water during Carboniferous times as the pulses of collision occurred during the Variscan Orogeny. Glacial sands from the Pleistocene can be seen in the inland dunes, which moved inland in the 14<sup>th</sup> century storm episodes to engulf the village and castle. Another dune field can be seen at Rhossili, to the north of the lovely sandy beach, which fronts hills of ORS and Carboniferous Limestone.

**Start point** Exit 47 M4, Mumbles Head SS 636 871

**Southwest Wales**

**North Pembrokeshire Coast**

**Itinerary 1 The A487: New Quay to St David's** 50 miles

Road builders avoided the deep inlets, sticking to the inland plateau. Excursions to coastal inlets will reveal wonderfully slumped Ordovician beds beneath Silurian alternating siltstones and mudstones, the results of fast moving turbidity currents into the Welsh Basin. This journey also takes in the effects of the Caledonian Orogeny and slaty cleavage in the fine-grained mudrocks and chevron folds can be found. The last glaciation has also left its mark in the form of meltwater channels, frost chattered misfit drainage patterns, 'head', fluvio-glacial sand bodies and eskers deposited by rivers under the glaciers. Dark igneous rocks, some of which can be seen at Stonehenge, form the Preseli Hills. At Strumble Head, Ordovician volcanic rocks, consisting of 'pillow lavas' and ashes - greenish in colour because of later alteration, are interleaved with the slates. Dark slates at Aberiddy are easy to appreciate from the Pembrokeshire Coast Path, as less resistant slates form deep inlets with volcanic rock ribs between. Fossil graptolites can be found if you look carefully in the beach pebbles.

**Start point** New Quay SN 383 598

**Itinerary 2 St David's to Broad Haven and Little Haven** 15 miles

St David's Peninsula shows contrasting geology. To the north, Ordovician slates and igneous intrusions including gabbro occur beneath the landscape, whereas to the south, you find Cambrian sediments and Precambrian volcanics. Look out for the Lingula Flags in the Cambrian. Carn Llidi is

worth the climb to see the speckled gabbro. At St David's Head, see where the gabbro baked the Ordovician mudstones to form hornfels. Caerfai Bay is a good place to see the magnificent Cambrian and Precambrian rocks, dipping steeply to the south. Purple and green sandstones found here made good building stones for the Cathedral. Glacial sediments are easy to find at Newgale and see Cambrian rocks faulted against the Coal Measures which can be seen as a wave-cut platform. Precambrian rhyolite forms the foundations for Roch Castle. Cross the concealed Coal Measure rocks, folded and faulted during the Variscan Orogeny, but well exposed in the coastal cliffs. Nolton, Broad and Little Havens show these effects really well. Druidstone Haven is unique. A faulted 'horst' which brings Ordovician rocks to the surface. These have been affected by both the Caledonian and Variscan Orogenies. Everything to the south shows just Variscan effects.

**Start point** St. David's SM 754 253

### **The Marloes Peninsula**

#### **Marloes B4327 and C class roads**

This area reveals the rocks only in the cliffs below the Pembrokeshire Coast Path. St Bride's Haven shows multiple faults and folds in ORS mudstones and Carboniferous Limestone thrust at a very shallow angle on top. Silurian volcanics and sediments dip at a shallow angle at St Martin's Haven, where the National Trust car park is the hub of several paths for exploration of the youngest Silurian volcanics of the Welsh Basin, the ending of the Iapetus Ocean plate. Both basalt and andesite show gas bubbles, definite indicators of lava flows. Another National Trust car park allows access to the beach at Marloes. Silurian fossil worm burrows, occur in some of the sandstones. The Silurian gives way to ORS opposite Gateholm Island, coarse conglomerates and sandstones, reddish in colour and resulting from flash floods.

**Start point** Talbenny SM 839 119

### **The Pembrokeshire Peninsula**

#### **Itinerary 1 The A478 / A4319 / A4320: South of peninsula 17 miles**

The landscape is very different and strongly influenced by the folded rocks of the ORS and Carboniferous Limestone, with a distinctive east-west Variscan fabric. Exposures are confined to the coast, where evidence for large folds can be discovered at Freshwater East and Stackpole Quay, where the harbour is the core of an eroded anticline in the Carboniferous Limestone. Freshwater West exposes Palaeozoic rocks unconformably overlain by the ORS basal conglomerate. Find calcrete nodules, which indicate development in desert soil horizons. They also show the offset of a large north-south fault which breaks the rocks along the beach. At West Angle Bay, both ORS and Carboniferous Limestone are exposed in tight, asymmetric folds formed during the Variscan Orogeny.

**Start point** Pembroke SM 985 014 or Freshwater East SS 018 984

#### **Itinerary 2 A478 / A4139: Pembroke to Begelly 17 miles**

The road from Pembroke to Manorbier, birthplace of Gerald of Wales, crosses a flat grassy plateau over Carboniferous rocks with no outcrops. At Manorbier, you are back on ORS mudstones and thin sandstones, vertical in attitude but strongly folded. You can see rippled upper surfaces and calcrete nodules. Tenby, on the southern edge of the Pembrokeshire Coalfield, is on the Ritec Fault, which forms the inlet of Milford Haven at its west end, and thrusts the folded Carboniferous Limestone up over the Coal Measures. Good tight folds from Variscan disturbance can be seen. At Saundersfoot, Coal Measure sandstones and mudstones form the cliffs, with lots of sedimentary and structural interest including Ladies' Cave, one of the most photographed anticlines in Britain.

**Start point** Pembroke SM 985 014

#### **Itinerary 3 The Coast Road: Begelly to Pendine 10 miles**

A gentle journey on one of Pembrokeshire's C class roads over a high grassy terrace with no outcrops but the cliff sections take a journey telling a different story. Carboniferous Coal Measure rocks are tightly folded and broken up by faults which disrupt the repetitions of the Coal Measure sediment pattern. To the south of Amroth West you cross the Variscan Orogenic front and at Amroth East the Coal Measure rocks are undisturbed, so the story of coal formation is much easier to work out. Fossil evidence of rootlets and plant fossils can be found.

**Start point** Begelly SN 119 074

### **The back roads between Pendine and Carmarthen**

#### **Itinerary 1: The A4066: Pendine to St Clears (9 miles/14 km)**

Pendine Sands were the place to break land speed records. This wonderful beach has sand reworked by the waves from sand generated by the last glaciation. Carboniferous Limestone to the west of the beach, shows evidence for sea-level fluctuations. You find massive beds of broken

limestone blocks, formed when sea-level fell and surface waters dissolved the limestone to form caves and sinkholes. The roofs collapsed and the hollows filled with the collapse debris. As sea-level rose, the overlying limestone beds show normal horizontal beds. Carboniferous Limestone forms 10 – 20m thick beds of blue-grey, fossiliferous limestone. Vertical joints keep the cliffs steep but waves undercut the cliffs and rock falls occur, so caution is needed. East of Pendine, ORS shows fine sedimentary structures at Laugharne, on the foreshore and the banks of Afon Taf, where Dylan Thomas wrote 'Under Milk Wood' in his boathouse.

**Start point** Pendine SN 233 080

**Itinerary 2: The B4312: Carmarthen to Llansteffan 7 miles**

Bedrock exposure is only seen on the shore south of Llansteffan. Grey-green upper ORS mudstones emerge from below red, Irish Sea till. Within the mudstones, which redden as the rocks age, you can find calcrete nodules formed after seasonal rains in semi- to arid soils when Wales was 20 ° south of the Equator, an interesting environmental story.

**Start point** Carmarthen SN 414 199

## **Southern Pembrokeshire and Carmarthenshire**

**The Inland roads: A40, A477 and A478**

**Itinerary 1 The A40: Carmarthen to Fishguard 46 miles**

Outcrops are rare. The road follows an Ordovician slate belt, with good colour banding, which can be seen in cuttings at Whitland. To the north of Haverfordwest, Treffgarne Gorge, incised by glacial meltwaters, exposes Precambrian volcanics. Rhyolites form high cliffs above the gorge on which stands Maiden's Castle, an iron-age hill fort. The disused, roadside aggregate quarries expose ashes and shales, volcanic bombs have been found, as have rippled surfaces indicating these rocks formed under water.

**Start point** Carmarthen SN 414 199

**Itinerary 2 The A477: St Clears to Pembroke and Haverfordwest 33 miles**

Road cuttings allow you to see the effects of both the Caledonian and Variscan continental collisions. West of St Clears, lower Palaeozoic grey slates show up in cuttings, with Caledonian folding which developed before the ORS was draped over the eroded surface. West of Red Roses, the soil changes to red showing the presence of ORS and forming good farming land. Further west, brown soils indicate a change to Coal Measures, which are clearly visible in superb road cuttings, weakly folded because they are north of the Variscan front. Pembroke Castle stands on Carboniferous Limestone, but outcrops are rare. Faults thrust Precambrian rocks to the surface at Johnston, where the Variscan Front is crossed, but these diorites can only be seen in a quarry to the west.

**Start point** St Clears SN 278 161

**Itinerary 3 The A478: Tenby to Cardigan 35 miles**

The road crosses sandstones of the Carboniferous Coal Measures, the Variscan Front and then red soils indicate ORS, but outcrops are non-existent. After the A40, Ordovician slates form bedrock and again no outcrops occur. A few tors of Ordovician volcanics can be seen.

**Start point** Tenby SN 125 005

## **GEOMÔN ANGLESEY GEOPARK**

[www.geomon.co.uk](http://www.geomon.co.uk)

Contact re publications: Margaret Wood [college@btinternet.com](mailto:college@btinternet.com)

### **Footsteps Through Time- the Rocks and Landscape of Anglesey explained**

GeoMôn geopark production by Stewart Campbell. Margaret Wood and Brian Windley with 14 new geotrails:

1. Cemaes Bay The rock trail. SH 369939
2. Marquess of Anglesey's Column SH 535716
3. Llanddwyn Island SH393635
4. Llanbadrig. SH 376937
5. Rhoscolyn. SH270757
6. South Stack. SH210820
7. Rhosneigr. SH319731
8. Parys Mountain. 439906
9. Cemaes Bay- The dyke trail, SH 369939
10. Gallows Point. SH 595752

11. Traeth Lligwy. SH 865871
12. Red Wharf Bay, SH 536799
13. Malltraeth. SH404690
- 14 Lleniog. SH820791

**Cost** £25 <http://www.geomon.co.uk/e-shop/4579786809>

## **SOUTH WALES GEOLOGISTS' ASSOCIATION - CYMDEITHAS Y DAEAREGWYR GRWP DE CYMRU**

[www.swga.org.uk](http://www.swga.org.uk)

Contact re Publications: Rhian Kendall (Editor) Email [webmaster@swga.org.uk](mailto:webmaster@swga.org.uk) Tel: 07963 732276

### **Geological Walks in Wales – Porthcawl, 1997**

**Teithiau Cerdded Daeargol Yng Nghymru - Porth-cawl (Welsh), 1998**

S R Howe

**Start point** Harbour breakwater at Porthcawl SS 819 763

**Cost** free from: [www.swga.org.uk/pdf/Porthcawl.pdf](http://www.swga.org.uk/pdf/Porthcawl.pdf); [www.swga.org.uk/pdf/C\\_Porthcawl.pdf](http://www.swga.org.uk/pdf/C_Porthcawl.pdf)

### **Walks in Wales - Penarth, Lavernock and St Mary's Well Bay, 1994**

S R Howe

**Start point** The esplanade at Penarth ST 185 704

**Cost** free from: [www.swga.org.uk/pdf/Penarth.pdf](http://www.swga.org.uk/pdf/Penarth.pdf)

### **Walks in Wales – Dunraven, 1998**

**Teithiau Cerdded Daeargol Yng Nghymru -Bae Dwnrhefn southerndown (Welsh), 1998**

S R Howe

**Start point** Dunraven Park SS 885 732

**Cost** free from: [www.swga.org.uk/pdf/dunraven.pdf](http://www.swga.org.uk/pdf/dunraven.pdf) ; [www.swga.org.uk/pdf/C\\_dunraven.pdf](http://www.swga.org.uk/pdf/C_dunraven.pdf)

### **Walks in Wales - Head of the Clydach Gorge, 1991**

T Sharpe

**Start point** Black Road SE of Bridge SO 198 122

**Cost** free from: [www.swga.org.uk/pdf/Clydach.pdf](http://www.swga.org.uk/pdf/Clydach.pdf)

### **Walks in Wales - Cwm Craig Ddu, 1991**

R M Owens

**Start point** Alongside cattle grid SN 9634 4790

**Cost** free from: [www.swga.org.uk/pdf/CwmGraigDdu.pdf](http://www.swga.org.uk/pdf/CwmGraigDdu.pdf)

### **Walks in Wales – Pontneddfechan, 1991**

G Owen

**Start point** Near Angel Pub, Pontneddfechan SN 9004 0763

**Cost** free from: [www.swga.org.uk/pdf/Pontneddfechan.pdf](http://www.swga.org.uk/pdf/Pontneddfechan.pdf)

### **Walks in Wales - Ogmore by Sea (English), 1996**

**Teithiau Cerdded Daeargol Yng Nghymru -Aberogwr Bro Morgannwg (Welsh), 1998**

S R Howe

**Start point** The lifeguard post SS 862 754

**Cost** free from: [www.swga.org.uk/pdf/ogmore.pdf](http://www.swga.org.uk/pdf/ogmore.pdf); [www.swga.org.uk/pdf/AberOgwr.pdf](http://www.swga.org.uk/pdf/AberOgwr.pdf)

### **Walks in Wales - Craig-y-Nos, 1996**

G Owen

**Start point** Car park at Crag y nos Country Park SN 8400 1554

**Cost** free from: [www.swga.org.uk/pdf/Craigynos.pdf](http://www.swga.org.uk/pdf/Craigynos.pdf)

### **Walks in Wales – Llansteffan, 1996**

G Owen

**Start point** Car park below castle SN 3522 1046

**Cost** free from: [www.swga.org.uk/pdf/llansteffan.pdf](http://www.swga.org.uk/pdf/llansteffan.pdf)

### **Walks in Wales - Porth-yr-Ogof to Sgwd Clungwyn, 1996**

T Sharpe

**Start point** Porth yr Ogof car park SN 928 124

**Cost** free from: [www.swga.org.uk/pdf/porthyrOgof.pdf](http://www.swga.org.uk/pdf/porthyrOgof.pdf)

### **Walks in Wales - Cribarth from Craig-y-Nos, 1996**

G Owen

**Start point** Car park at Crag y nos Country Park SN 8400 1554

**Cost** free from: [www.swga.org.uk/pdf/cribarth.pdf](http://www.swga.org.uk/pdf/cribarth.pdf)

### **Walks in Wales - Barry Island-Friars Point, 1998**

A J Thomas

**Start point** Car park at Barry Island ST 1100 6650

**Cost** free from: [www.swga.org.uk/pdf/barry.pdf](http://www.swga.org.uk/pdf/barry.pdf)

### **Walks in Wales - Building stones of Cardiff 1. Cardiff Bay, 2004**

D Wellings & L Garfield

**Start point** Junction of Bute Street and James Street

**Cost** free from: [www.swga.org.uk/pdf/CardiffBay.pdf](http://www.swga.org.uk/pdf/CardiffBay.pdf)

### **Walks in Wales - Building stones of Cardiff 2. Cathays Park to Queen Street, 2005**

**Teithiau Cerdded Daeregol Yng Nghymru -Cerrig adeiladu Caerdydd 2. Parc Cathays i Heol y**

**Frenhines (Welsh), 2006**

E Robinson & T Sharpe

**Start point** Front steps of National Museum of Wales Cardiff ST 183 769

**Cost** free from: [www.swga.org.uk/pdf/CathaysPark.pdf](http://www.swga.org.uk/pdf/CathaysPark.pdf); [www.swga.org.uk/pdf/C\\_CathaysPark.pdf](http://www.swga.org.uk/pdf/C_CathaysPark.pdf)

### **Walks in Wales - Building stones of Newport, 2009**

E Robinson

**Start point** North end of Cambrian Road, opposite railway station ST 309 882

**Cost** free from: [www.swga.org.uk/pdf/newport.pdf](http://www.swga.org.uk/pdf/newport.pdf)

### **Walks in Wales - Dinosaur Footprints at The Bendrick Rock, 2007**

T Sharpe

**Start point** To west of small slipway, east of Bendrick Rock ST 1334 6702

**Cost** free from: [www.swga.org.uk/pdf/Bendrick.pdf](http://www.swga.org.uk/pdf/Bendrick.pdf)

### **The Land of the Beacons Way, 2014**

D Harlow

Description: Describes the landscape and geology across the Brecon Beacons National Park as seen from the Beacons Way, a long distance walking route from Ysgyryd Fawr in the east to Bethlehem in the west.

**Start point** The Skirrid SO 328 164

**Cost** £795 from: [www.swga.org.uk/pubs.html](http://www.swga.org.uk/pubs.html)

## **REGION 12: IRELAND**