



# *Geology Path*

*Malcolm Barnes*



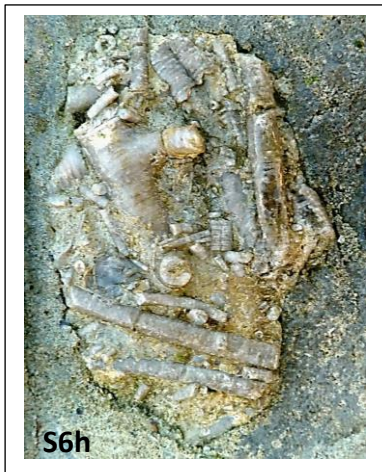




S16



S28

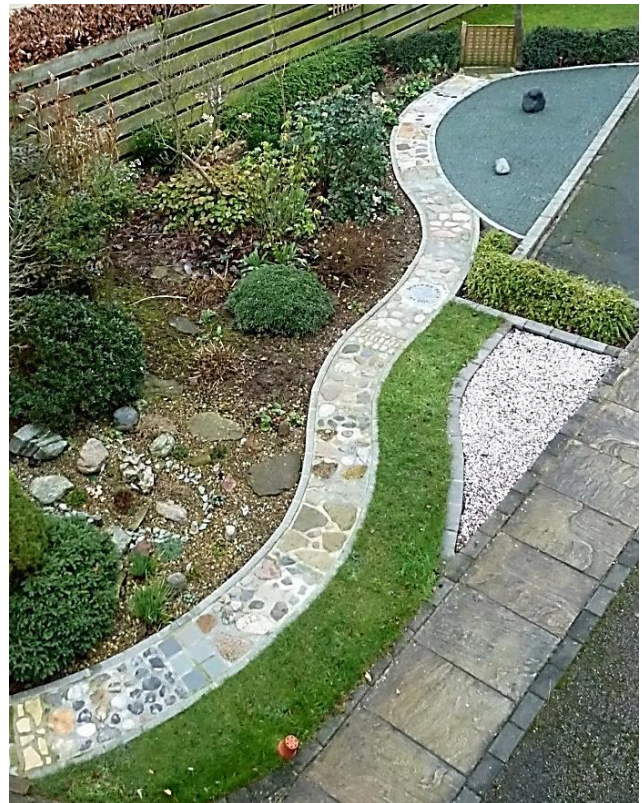


S6h

**Contents:**  
Introduction.  
Scale plan of path  
(with positions of  
numbered sections  
and samples).  
Index of sections,  
samples, sources  
and geological  
periods.  
Photographs of  
selected locations.



S11c





## Creating the Geology Path

In 2014 we were developing a strip of front garden that leads away from the house alongside the road. Its long narrowing shape presented a design problem. It was an odd shape that didn't go anywhere. It needed an access path and paths are supposed to lead somewhere, even if it's only to another section. Yet, just as the process of gardening can be an end in itself, why can't a path be that too? Not only the journey along it or what you see from it, but the making of it? And why not make the contents of the path its purpose?



Marking the line of the path through the new section of garden before edging with bricks.



By the rockery the path has Norfolk flint, quarry swatches, crystals, fossils, Irish porcellanite, etc.

Over previous years we had collected lots of 'rocks' on holidays and several stone sculptures for the main garden. And we had also been gradually accumulating rock samples and fossils from outings and field trips with the Midweek Geology Group based in Yorkshire. Like many people, I had labelled and bagged them just in case, but without any real plan of what could be done with them in the end. How many other amateur geologists have collections gathering dust in the garage or loft? On one trip, to Shetland some years earlier, a seed had been planted in my subconscious when we visited the amazing 'geology wall' at Mavis Grind, which displays samples of all the kinds of rocks to be found on the island as well as an interpretation board naming them.



Geology Wall at Mavis Grind, Shetland



Sea-washed Islay beach pebbles in the Geology Path



One day when we were talking about what kind of path to have in the garden extension the penny dropped: why not put all our rock samples and fossils into it? Why not collect lots more over the next year to pave all 11 metres of the new path? Several geologist friends donated pieces to the project and it gradually gathered momentum. We decided on an aesthetic arrangement, with samples grouped loosely according to where they came from, rather than their geological periods.



Preselli 'bluestone' as used at Stonehenge (S14)



Delaminating equisetum fossil (centre)

Other problems in the design and construction were solved as we went along. The samples had to have at least one flat surface and be small enough to fit into the fairly narrow dimensions of the path. They needed to be durable and withstand wear and winter frosts. Some mudstones soon proved too soft, including a lovely fossil equisetum which unfortunately started delaminating and breaking up after repeated wetting and drying, so were replaced by more durable fossils. Some fine but delicate examples of graptolites had to be rejected.



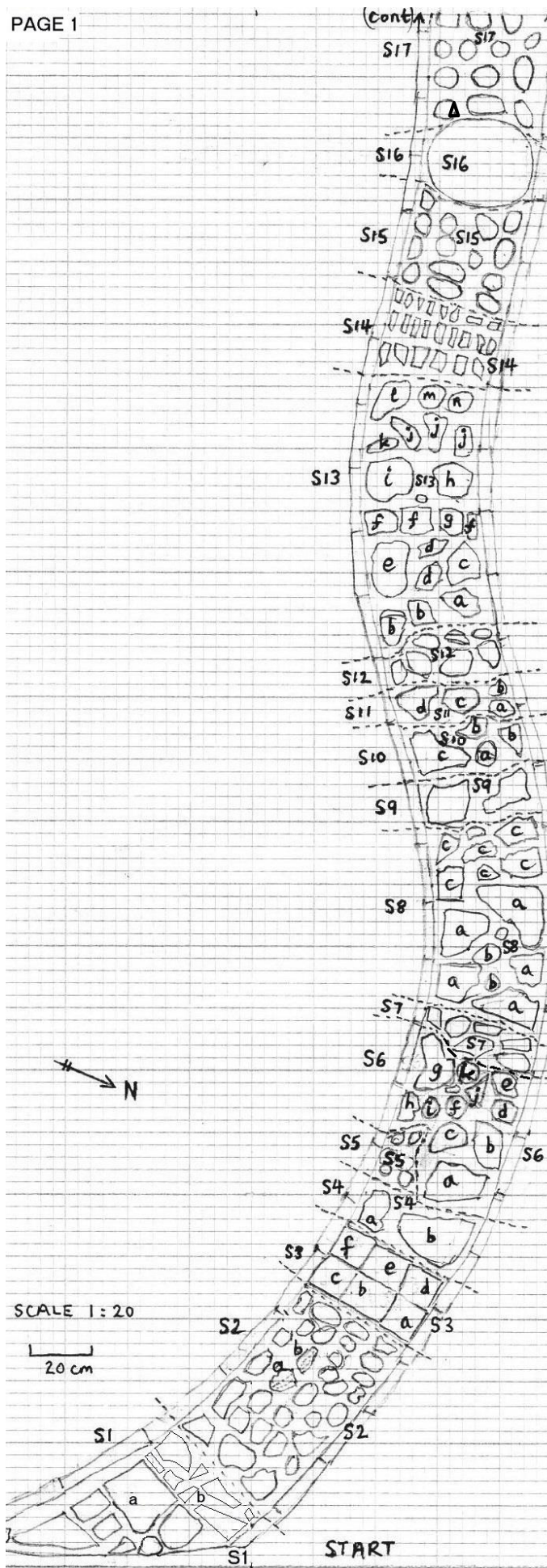
But with careful bedding and pointing, construction of the path was completed in about 40 days stretched over 18 months. This included drawing and recording section by section along a base-line tape using a 20cm squared one-metre drawing frame. Without a plan showing all the samples and where they came from the geological information would be lost and it would only be a pretty path. The surface was topped off finally with two coats of a water-based sealant to keep the rain and frost from penetrating the exhibits.

The path had become an end in itself...

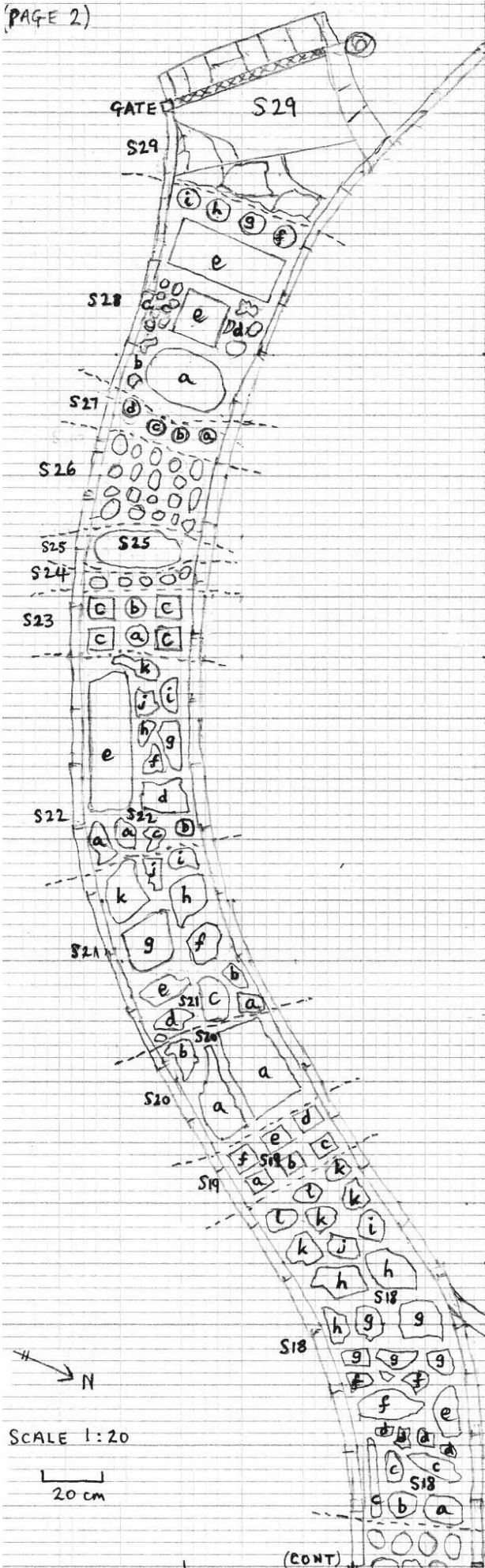


**Plan of Geology Path**

PAGE 1



- S17** Islay, Sanaigmore beach pebbles;
- S16** granite (AT) title stone carved by monumental mason; plus small sample of granite, Mt. Everest
- S15** Islay, Portnahaven, beach pebbles polished in narrow sea gully, various types/periods;
- S14** Preselli Mts, 'bluestone', spotted dolerite with pellets of feldspar; Ordovician 450Ma;
- S13** Pembrokeshire: **a** rhyolite, St. Non's Well, Pre-Camb 540+Ma; **b** microgranite, Porth Clais, late Pre-Cambrian 540+Ma; **c** 'Caerbwdy' purple sandstone, see St. David's Cathedral (SH), Cambrian 500Ma; **d** basal conglomerate, St Non's, Cambrian 500Ma; **e** red 'Caerfai Shales', Camb 500Ma (SH); **f** micro-diorite & **g** with rectangular feldspar crystals, igneous, Ordovician 450Ma; **h** lapillae tuff with pumice clasts (explosive volcanism) from Ramsey Isle; **i** hydrothermal breccia + quartz veins and igneous rock, Ordovician 450Ma; **j** ironstone, **k** sandstone beach pebbles with quartz, Broadhaven; **l** mudstone with trace fossil burrows above sandstone, Carboniferous, 320Ma; **m** rhyolitic breccia & **n** erratic, beach pebbles, Broadhaven;
- S12** pitchstone, Arran west coast, Tertiary 60Ma;
- S11** NE & Yorks coast: **a** trace fossil plant, Yorks coast, Mesozoic; **b** sandstone slickensides, Dales; **c** fossil ichthyosaur vertebra, Jurassic, 180Ma; **d** bi-valves & belemnite in coastal conglomerate, Durham (AH);
- S10** Scotland: **a** beach pebble, Lewis; **b** schist (DN); **c** Lewisian gneiss (AH);
- S9** Marlowes Beach, Pembrokeshire: coralliferous mudstone with orthid brachiopods, Silurian 430Ma;
- S8** Coquetdale, Northumberland: **a** fine sandstone + leaf deposits, Carboniferous 330Ma; **b** red granite pebbles; **c** ripple bedded sandstone, Carboniferous 330Ma;
- S7** Antrim, NI: porcellanite flakes, neolithic axe factory site, Tievebulliagh, Palaeogene 60Ma;
- S6** **a** bioturbated limestone mud, Mappleton, Yorks, Jurassic 180Ma (BC); **b** brachiopod in mudstone, orthid type, Silurian 430Ma (BC); **c** ganister nodule, coal tip, Todmorden, Carboniferous 340Ma; **d** chert ammonite; **e** trace plant fossil in mudstone (BC); **f** ganister, coal tip, Todmorden Moor, 340Ma; **g** coral colony, **h** branching crinoid and **i** polished ammonite (BC); **j** banded mudstone, Crummackdale, Silurian 430Ma; **k** brachiopod, limestone, Stainmore, Carboniferous 330Ma;
- S5** Cayton Bay, Yorks: incl. fingerhorn ammonite & zigzag 'cockscorb' oystershell, Jurassic 160Ma;
- S4** **a** fluorspar crystals, Trollers Ghyll, NY (DL); **b** 'pipe rock' worm tubes, NW Scotland, Cambrian 500Ma (DL);
- S3** Baycliffe Quarry swatches, Ulverston: **a** & **b** meta-volcanic, Ordovician 450Ma; **c** mudstone, Silurian 430Ma; **d** & **e** metavolcanic, Ordovician 450Ma; **f** metavolcanic, Silurian 430Ma;
- S2** Norfolk flint, incl. **a** & **b** fossil sponge stems;
- S1** **a** Yorkstone, sandstone, Carb. 330Ma; **b** mag limestone & manganese oxide crystals, local quarry, Permian 250Ma;



(Finish)

- S29** 'Yorkstone', Carboniferous 330Ma;
- S28** a slate, Slapton Sands, Devon, Devonian 395Ma; b chiastolite, Skiddaw Slates, L District, Ordovician 450Ma; c fossils and calcite crystals, Elbolton Reef Knoll, Y Dales, Upper Carb. 340Ma; d galena, barytes, calcite & fluorspar, Cold Cutts Quarry, N Yorks; e sandstone with dendritic manganese oxide crystals, India; f Cumbrian Slate swatch, Ordovician 450Ma; g Carrara Marble, Italy, Jurassic 160Ma; h Nabresina limestone, Italy; i Yorkstone, 330Ma;
- S27** gravestone swatches: a 'Emerald Pearl' & b 'Blue Pearl' granite (pub stone), Larvikite, Norway, Carboniferous 330Ma; c 'Bahama Blue' granite, India; d 'Dark Grey' gabbro;
- S26** Pembrokeshire beach pebbles, mainly Marlowes beach;
- S25** slate, Slapton Sands, Devon, Devonian 395Ma;
- S24** quartzite, beach pebbles, Anglesey;
- S23** a 'Baltic Brown' & b 'Indian Crystal Green', gravestone swatches, granite; c limestone, Baycliffe Quarry, 330Ma;
- S22** a calcareous marine mudstone with goniatite, coal tip, Todmorden Moor, Carbo. 330Ma; b beach pebble, Spurn Point; c ammonite, mudstone, Sandsend, Jurassic 170Ma; d ripple marks in lacustrine mudstone, Westray, Orkney, mid Devonian 465Ma, (DL); e sandstone with limpet marks, Brough of Birsay, Orkney, Devonian 465Ma; f cordirite, Skiddaw Slates, Lake District, Ordovician 460Ma; g sandstone with gypsum pseudomorphs, 'Lake Orcadie', Yesnerby, Orkney, 460Ma; h greisen, granite, Mosedale, L District, Ordovician 460Ma; i banded agate (BC); j fossilised wood, Queensland, Australia; k slickenside, re-crystallised slate, Honister, Ordovician 460Ma;
- S21** Northumberland (AT): a coral colony, Scremeston Limestone, low Carb. 310Ma; b Scremeston limestone bored by lythophaga mussels, 310Ma; c Eelwell limestone with shells & d with coral, Northumberland, 310Ma; e flip-side of d; f Fell Sandstone, Northumberland, 310Ma; g shelly Eelwell limestone; h dolerite, Whin Sill, North-umberland, 295Ma; i Cheviot andesite lava, Devonian 405Ma; j Acre limestone, 310Ma; k sandstone with trace fossils, 310Ma;
- S20** a 'sole marks', Millstone Grit, Yorkshire, Carb. 330Ma (DL); b corals in limestone, Borrowdale Beck, Stainforth;
- S19** Baycliffe Quarry swatches, Ulverston: a & b metavolcanic, Ordovician 450Ma; c mudstone, Silurian 430Ma; d, e & f meta-volcanic, Ordovician 450Ma;
- S18** Islay, Saligo Bay: a metamudstone + quartz, Neoproterozoic 900Ma (radiometric-dated zircon grains); b metasandstone, turbiditic, 900Ma; c laminated phyllites, metamudstone dep. 750Ma, met. 470Ma; Machir Bay: d lamprophyre, igneous intrusion, 470Ma; e metaultrabasite with amphibole crystals, beach pebble; Port Ellen west: f Jura Quartzite & mudstone \*dep. 630Ma, met. 470Ma; g ibid, with crystals; Caol Islay: h ripple-marked metasiltstone, date\*ibid; Port Weymss: i gneiss, 1800Ma; j amphibolite, metagabbro, 1800Ma; Port Ellen: k pebbly Scarba Conglomerate, opening of Iapetus Ocean, 600Ma; l metabasite, with phenocrysts, 600Ma.

Where contributions from others are included their initials are shown in brackets: Alison Tymon, Barbara Chamberlain, Sheila Wilson, David Leather, Anne Hopkins, Sheila Wilson, David Newman, Sid Howells.

**Index to Geology Path** (sections, samples, sources, periods)

**Acre Limestone:** Northumberland: S21j, Carboniferous  
**Agate:** banded: S22i, polished  
**Andesite lava:** S21i, Cheviot, Devonian  
**Ammonite:** S6i polished; S5 'fingerhorn', Jurassic; S22c, Jurassic  
**Amphibole:** crystals, Islay: S18e  
**Amphibolite:** Islay: S18j, metagabbro, Paleo-Proterozoic  
**Anglesey:** Cemaes Bay: S24 quartzite beach pebbles  
**Antrim:** Northern Ireland: S7 porcellanite, neolithic axe factory site, Tievebulliagh, Palaeogene  
**Arran:** Hebridean Island: S12 pitchstone  
**Australia:** Queensland: S22j fossilised wood  
**Axe factory site:** S7 porcellanite, neolithic site, Tievebulliagh, Antrim, Palaeogene  
**Barytes:** S28d, Cold Cutts Quarry, North Yorkshire  
**Baycliffe Quarry:** Ulverston, swatches: S3a, S3b, S3d and S3e metavolcanic, Ordovician; S3c mudstone, Silurian; S19a, S19b, S19d & S19e metavolcanic, Ordovician; S19c mudstone, Silurian; S23c limestone swatches, Carboniferous;  
**Bluestone:** S14 spotted dolerite with pellets of feldspar, Preselli Mountains; as used at Stonehenge  
**Brachiopod:** S6b orthid type, Silurian; S6k limestone, Stainmore, Yorkshire, Carboniferous; S9 orthid, Marlowes, Pembrokeshire, Silurian.  
**Broadhaven:** Pembrokeshire: beach pebbles, S13k, S13m, S13n  
**Brough of Birsay:** Orkney: S22e, sandstone with limpet marks, Devonian  
**Burrows:** S13l trace fossils in mudstone  
**Caerbwdy purple sandstone:** S13c, Pembrokeshire, as used on St. David's Cathedral  
**Caerfai Shales:** red, S13e, Cambrian, Pembrokeshire  
**Calcite crystals:** S28c, Elbolton Reef Knoll, Yorkshire Dales, Upper Carboniferous; S28d, Cold Cutts Quarry, North Yorkshire  
**Cambrian: (542-488 Mya)** Scotland: S4b 'pipe rock', worm tubes; Pembrokeshire: S13b microgranite, S13c purple sandstone, S13d basal conglomerate, S13e red shale  
**Caol Islay:** Islay: S18h, ripple-marked metasiltstone, Ordovician  
**Carboniferous: (359-299 Mya)** Yorkshire: S1a and S29, Yorkstone; S28i Yorkstone, gravestone swatch; Todmorden: S6c & S6f ganister nodules; Pembrokeshire: S13l mudstone; Northumberland: S21a limestone; S21b limestone; S21c limestone; S21d & S21e limestone; S21f sandstone; S21g limestone; S21j limestone; S21k sandstone; S22a mudstone  
**Cayton Bay:** Yorkshire: S5 'fingerhorn' ammonite, Jurassic; S5 'cockcomb' oystershell, Jurassic  
**Chastolite:** Lake District: S28b, Skiddaw Slates, Ordovician  
**Cheviot:** andesite lava, S21i, Devonian  
**Cold Cutts Quarry:** North Yorkshire: S28d galena, barytes, calcite and fluorspar  
**Conglomerate:** S13d basal conglomerate, Cambrian, St. Non's  
**Coquetdale:** Northumberland: S8 rock samples  
**Coral:** S6g; S21a, Scremeston, Carboniferous; S21d, Eelwell, Carboniferous  
**Cordirite:** Lake District: S22f, Skiddaw Slates, Ordovician  
**Crinoid:** branching, S6h  
**Crummackdale:** S6j banded mudstone, Silurian  
**Dendritic crystals:** S28e, of manganese oxide in sandstone  
**Devonian: (416-359 Mya)** S21i Cheviot andesite lava; S22d ripple marked mudstone; S22e sandstone with limpet marks; S28a slate  
**Dolerite:** spotted, see bluestone, S14; S21h, Whin Sill, Northumberland, Permian  
**Dolostone:** S1b (magnesian limestone) with manganese oxide crystals, local quarry, Permian  
**Eelwell limestone:** Northumberland: S21c, with shells; S21d, with coral; S21g, shelly  
**Elbolton Reef Knoll:** S28c fossils and calcite crystals, Upper Carboniferous

**Everest Mt.:** S16, granite

**Explosive volcanism:** S13h, lapillae tuff with pumice clasts, Marlowes Beach pebble, Pembrokeshire

**Feldspar:** S13g, rectangular crystals in microdiorite, Ordovician; S14, pellets in 'Bluestone'

**Fell Sandstone:** Northumberland: S21f, Carboniferous

**Flint:** Norfolk: S2, incl. S2a and S2b fossil sponge stems

**Fluorspar crystals:** S4a, Trollers Ghyll, Yorkshire; S28d, Cold Cutts Quarry, North Yorkshire;

**Fossils:** S2a and S2b fossil sponge stems; S5 'fingerhorn' ammonite, Jurassic; S5 'cockcomb' oystershell, Jurassic; S8a leaf deposits in sandstone, Carboniferous: S11c ichthyosaur vertebra, Jurassic; S11a plant, Mesozoic; S11d bi-valves and belemnite; S13l trace fossil burrows, Carboniferous; S21b traces of boring by *Lythophaga* mussels, Carboniferous; S21c shells, Carboniferous; S21k trace fossils in sandstone, Carboniferous; S22a goniatite, Carboniferous; S22e limpet marks, Devonian; S22j fossilised wood; S28c fossils, Upper Carboniferous

**Gabbro:** S27d 'Dark Grey', gravestone swatch

**Galena:** S28d, Cold Cutts Quarry, North Yorkshire

**Ganister:** nodules S6c and S6f, coal tip, Todmorden Moor, Carboniferous

**Gneiss:** Lewisian: S10c; Islay: S18i

**Goniatite:** S22a, Carboniferous

**Granite:** S16 title stone; S22h greisen, Mosedale, Lake District, Ordovician; see also gravestone

**Gravestone:** swatches: S23a 'Baltic Brown', Rapakivi granite, Finland; S23b 'Indian Crystal Green' granite; S27a 'Emerald Pearl' granite; S27b 'Blue Pearl', aka 'Pub Stone', Larvikite granite, Norway; S27c 'Bahama Blue', granite; S27d 'Dark Grey', gabbro; S28f Cumbrian slate, Ordovician; S28g Carrara marble, Italy, Jurassic; S28h Nabresina limestone, Italy; S28i Yorkstone, Carboniferous

**Greisen:** granite: S22h, Mosedale, Lake District, Ordovician

**Gypsum pseudomorphs:** S22g sandstone, 'Lake Orcadie', Yesnerby, Orkney, Ordovician

**Honister:** Lake District: S22k 'slickensides', re-crystallised slate, Ordovician

**Hydrothermal breccia:** S13i, Marlowes Beach pebble

**Igneous:** S13f and S13g microdiorite; S13i hydrothermal breccia; S18d lamprophyre intrusion

**Ironstone:** S13j, beach pebbles, Marlowes

**Islay:** Hebridean island: S15 and S17 beach pebbles; S18 various rock samples. Reference guide book: *A Guide to the Geology of Islay*, D Webster et al., Ringwood Glasgow, 2015

**Iapetus Ocean:** opening of: S18k, pebbly Scarba Conglomerate, 600 Mya

**Jura Quartzite:** Islay: S18f

**Jurassic: (200-146 Mya)** Cayton Bay, Yorkshire: S5 'fingerhorn' ammonite; S5 'cockcomb' oystershell; Sandsend, Yorkshire: S11c ichthyosaur vertebra; Italy: S28g Carrara marble, gravestone swatch

**Lacustrine mudstone:** S22d, ripple marks, Westray, Orkney, Devonian

**Lake District:** S22f cordirite, Skiddaw Slates, Ordovician; S22h greisen, Mosedale, Ordovician; S22k 'slickensides', re-crystallised slate, Honister, Ordovician; S28b chiastolite, Skiddaw Slates, Ordovician

**Lake Orcadie:** S22g, Yesnerby, Orkney, Ordovician

**Lamprophyre:** Islay: S18d, igneous intrusion, Ordovician

**Lapillae tuff:** Pembrokeshire: S13h, with pumice clasts, explosive volcanism

**Lewis:** Isle of, Scotland, S10.

**Limestone:** S6a bioturbated limestone mud, Mappleton, Yorkshire, Upper Jurassic; S28h Nabresina limestone, Italy, gravestone swatch; S23c limestone, Baycliffe Quarry swatches, Carboniferous; see also 'Acre Limestone'; 'Eelwell limestone'; 'magnesian limestone'; 'Scremeston Limestone'

**Lythophaga:** mussel: S21b, Scremeston Limestone, Carboniferous;

**Machir Bay:** Islay: S18d lamprophyre intrusion; S18e metaultrabasite with amphibole crystals



**Magnesian limestone:** S1b (dolostone) with manganese oxide crystals, local quarry, Permian

**Mapleton:** Yorkshire: S6a, bioturbated limestone mud

**Marble:** S28g Carrara marble, gravestone swatch, Italy, Jurassic

**Marlowes Beach:** Pembrokeshire, S9 coralliferous mudstone; S13h; S26 pebbles

**Mesozoic: (251-65 Mya)** Yorkshire Coast: S11a, trace plant fossil

**Metabasite:** Islay: S18l, with phenocrysts, Neo-Proterozoic

**Metamudstone:** S18a, Islay, Neo-proterozoic; S18c

**Metasandstone:** Islay: S18b, Neo-proterozoic

**Metasiltstone:** Islay: S18h, ripple marked, Ordovician

**Metaultrabasite:** Islay: S18e, with amphibole crystals

**Metavolcanic:** Baycliffe Quarry swatches: S3a, S3b, S3d and S3e, Ordovician; S3f, Silurian

**Micro-diorite:** S13f, Pembrokeshire

**Microgranite:** S13b, Porth Clais, late Pre-Cambrian

**Millstone Grit:** Yorkshire: S20a, 'with sole marks', sandstone, Carboniferous

**Monumental mason:** see S16 title stone carving

**Mosedale:** Lake District: S22h greisen, Ordovician

**Mudstone:** Ulverston: S3c, Silurian; Crummackdale: S6j banded mudstone, Silurian; Islay: S18f & S18g, Ordovician; Todmorden Moor: S22a calcareous marine mudstone, Carboniferous; Westray, Orkney: S22d lacustrine mudstone with ripple marks

**Neoproterozoic: (850-550Mya)** Islay: S18a metamudstone; S18b metasandstone; S18l, metabasite

**Northumberland:** S21; see: Acre Limestone; Cheviot; Eelwell Limestone; Fell Sandstone; Scremeston Limestone; Whin Sill

**Ordovician: (488-443 Mya)** S3 a and S3b metavolcanic; S13g feldspar crystals in microdiorite; S14, Preselli 'bluestone'; S18h metasiltstone; S19a, S19b, S19d & S19e metavolcanic; S22f cordirite; S22g gypsum pseudomorphs, sandstone; S22h greisen, granite; S28f Cumbrian slate; S28b chialtolite, Skiddaw Slates

**Orkney:** S22d lacustrine mudstone with ripple marks, Westray, Devonian; S22e, sandstone with limpet marks, Devonian; S22g sandstone, Yesnerby, Ordovician

**Orthid:** type of brachiopod, S9 Marlowes, Pembrokeshire, Silurian

**Palaeogene: (65-23 Mya)** Antrim: S7, porcellanite

**Paleo-Proterozoic: (2500-1600 Mya)** Islay: S18j amphibolite, metagabbro (1800Mya)

**Pembrokeshire:** S13 rock samples; S26 beach pebbles, mainly Marlowes Beach

**Permian: (299-251 Mya)** S1b, magnesian limestone (dolostone), with manganese oxide crystals, cut pieces, local quarry

**Phyllites:** laminated: Islay: S18c metamudstone, Ordovician

**Pipe rock:** worm tubes, S4b, NW Scotland, Cambrian

**Pitchstone:** S12, west coast of Isle of Arran, Hebrides, Tertiary

**Port Ellen:** Islay: S18f and S18g, Jura Quartzite and mudstone

**Port Ellen:** Islay: S18k pebbly Scarba Conglomerate; S18l metabasite with phenocrysts, Neo-Proterozoic

**Port Weymss:** Islay: S18i gneiss, Paleo-Proterozoic; S18j, metagabbro, Paleo-Proterozoic

**Porth Clais:** Pembrokeshire, S13b, microgranite, late Pre-Cambrian

**Portnahaven:** Islay, S15, polished beach pebbles in sea-gully

**Pre-Cambrian: (540+ Mya)** Pembrokeshire: S13a rhyolite

**Pre-Cambrian: (540+ Mya)** S13a; S13b; S13c; S13d; S13e, Pembrokeshire

**Preselli:** Preselli Mountains, Pembrokeshire, source of spotted dolerite or 'bluestone', S14

**Pub Stone:** common name for S27b 'Blue Pearl', gravestone swatch, Larvikite granite, Norway

**Pumice clasts:** S13h, in lapillae tuff

**Quartz:** S13i; S13k; S18a

**Quartzite:** Islay: S18f and S18g Jura quartzite; S24 beach pebbles, Cemaes Bay, Anglesey

**Radiometric dating:** using zircon grains: S18a metamudstone, Islay

**Rhyolite:** S13a, St. Non's Well, Pembrokeshire; S13m rhyolitic breccia

**Ripple marks:** S8 ripple-bedded sandstone; S18h ripple marked siltstone; S22d lacustrine mudstone

**Saligo Bay:** Islay: S18a metamudstone; S13b metasandstone; S13c laminated phyllites, metamudstone; S13d lamprophyre; S13e metaultrabasite

**Sandsend:** Whitby: S11c ichthyosaur vertebra, Jurassic

**Sandstone:** Yorkshire: S1a, Carboniferous; S11b 'slickensides'; S20a, Millstone Grit, with 'sole marks', Carboniferous; Coquetdale: S8a with leaf deposits; S8c ripple bedded; Pembrokeshire: S13k beach pebbles; Northumberland: S21f, Fell Sandstone, Carboniferous; S21k trace fossils, Carboniferous; Orkney: S22e with limpet marks, Devonian; S22g gypsum pseudomorphs, Ordovician; S28i Yorkstone, Carboniferous, gravestone swatch; S29 Yorkstone, Carboniferous; S28e sandstone with dendritic manganese oxide crystals, paving stone, India

**Schist:** Scotland: S10b

**Scremeston Limestone:** Northumberland: S21a, coral colony, Carboniferous; S21b bored by lythophaga mussels, Carboniferous

**Silurian: (443-416)** Ulverston: S3c mudstone; S19c mudstone; S3f metavolcanic; Pembrokeshire: S9 coralliferous mudstone

**Skiddaw Slates:** Lake District: S22f cordirite, Ordovician; S28b chiastolite, Ordovician

**Slapton Sands:** Devon: S28a slate, Devonian

**Slate:** Lake District: S22k 'slickensides', re-crystalised slate, Honister, Ordovician; S28f Cumbrian slate, gravestone swatch, Ordovician; Slapton Sands, Devon: S25 and S28a, Devonian:

**Slickensides:** S11, sandstone, Y Dales, Ordovician; S22k, re-crystalised slate, Honister, L District, Ordovician

**Sole marks:** grooves or molds at the interface of two different lithologies: S20a, Millstone Grit

**St. David's Cathedral:** Pembrokeshire: S13c, 'Caerbwdy' purple sandstone, facing stone

**St. Non's Well:** Pembrokeshire, S13a, rhyolite

**Stainforth:** Yorkshire: S20a, Borrowdale Beck

**Stonehenge:** see Bluestone, S14

**Tertiary: (66-2.6 Mya)** Isle of Arran: S12, pitchstone

**Todmorden Moor:** S22a goniatite, mudstone

**Trollers Ghyll:** Yorkshire: S4a fluorspar crystals

**Ulverston:** see Baycliffe Quarry

**Westray:** Orkney, S22d lacustrine mudstone with ripple marks, Devonian

**Whin Sill:** Northumberland: S21h dolerite, Permian

**Worm tubes:** 'pipe rock', S4b, NW Scotland, Cambrian

**Yorkshire Coast:** S11a, trace fossil of plant, Mesozoic

**Yorkshire Dales:** S11b sandstone 'slickensides'; Elbolton Reef Knoll: S28c fossils and calcite crystals, Upper Carboniferous; Trollers Ghyll: S4a fluorspar crystals

**Yorkstone:** S1a sandstone building material, Carboniferous; S29 'Yorkstone', Carboniferous.

## GEOLOGICAL TIME CHART

Origins		Precambrian						Phanerozoic (Visible Life)										EON	
		Achaean			Proterozoic			Paleozoic					Mesozoic			Cenozoic		ERA	
Hadearian	Big Bang	Precambrian						Cambrian	Ordovician	Silurian	Devonian	Carboniferous	Permian	Triassic	Jurassic	Cretaceous	Tertiary	Quaternary	Holocene
20,000 MYA	4600 MYA	4200 MYA	3400 MYA	3000 MYA	2500 MYA	670 MYA	541-485 MYA	485-443 MYA	443-419 MYA	419-359 MYA	359-299 MYA	299-252 MYA	252-201 MYA	201-145 MYA	145-66 MYA	66-1.8 MYA	2.6-.0005 MYA	11700 YBP-present	



Locations where some of the rocks can be seen. (See index)



**Magnesian limestone. River Wharfe, Boston Spa**



**Flint nodules on a Norfolk beach**



**Marlowes Beach, Pembrokeshire**



**Purple Caerbwdy Sandstone, Pembrokeshire**



**Bluestones in the Preselli Mountains**



**Pitchstone on the west coast of Arran**





**Baycliffe Quarry, Lake District**



**Gully with sea-washed pebbles on Islay**



**Metamudstones at Saligo Bay, Islay**



**Ripple-marked metasiltsstones at Caol Islay**



**Jurassic cliffs at Cayton Bay, North Yorkshire**



**Sea stack at Yesnerby, Orkney**

**No rock exposures were harmed in the making of the path. Collected samples were found loose on the ground. 'Swatches' were provided by a monumental mason or working quarries.**