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(Figure 47) View from south of Doddington, looking west. Simplified reconstruction of palaeo-Lake Milfield, showing probable lake extent (blue) and location of fan (brown).

(Figure 48) Ice-wedge cast in section at Woodbridge Farm Quarry. Ice wedges form under intensely cold conditions, as water freezes in vertical cracks in soils, and repeated freeze-thaw cycles widen the crack, into which larger debris is sorted by the freezing and thawing, causing swelling and shrinking of the soil.

(Figure 49) Ripple cross-bedded sands in section at Woodbridge Farm Quarry.

(Figure 50) Cobble gravels in section of River Breamish at Branton. Imbrication, or stacking of the clasts is clear, as is the less coarse alluvial deposit in the upper part of the section, relating to lower energy flow regimes. These most likely occurred long after the coarse material was deposited by glacial meltwater flow. Subsequent late Holocene activity has seen downcutting through the older deposits.

(Figure 51) Panoramic view from near Glanton Pyke, looking southwards toward Whittingham. The ridges marked ‘a’ and ‘b’, are clearly visible on the valley floor and were probably formed by glaciofluvial outwash processes.

(Figure 52) View from Pondicherry near Rothbury, looking southwards over the Coquet floodplain. Recent Holocene fluvial activity has ensured the floodplain has remained active. Low relief, linear ridges of glaciofluvial deposits are visible on the southern side of Coquetdale.

(Figure 53) Proposed flow regime in the Cheviot region (after Clapperton, 1971), with cold- and warm-based ice shown by blue/pink colouration of arrowed flowlines. Position of mega-scale glacial lineations shown in yellow (Clark et al., 2005). After Everest et al., 2006.

(Figure 54) Distribution of in situ weathered bedrock and tor features in the Cheviot massif (Hillshade image derived from NEXTMap® © Intermap Technologies Inc.).

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(Figure 56) Section in deeply weathered bedrock near Hownam; clearly showing the preservation of primary igneous texture.

(Figure 57) A meltwater channel draining north-eastward from Ewartly Shank [NT 9644 1470].

(Figure 58) The distribution of mineral veins in the district; the inset map shows, highly simplified, the main areas in Great Britain where mineral veins occur.

(Figure 59) Witherite crystals from Fallowfield Mine.

(Figure 60) Alstonite crystals from Fallowfield Mine.

(Figure 61) Cut and polished surfaces of agates, from amygdales in Devonian age lavas of Cheviot volcanic rocks, found as pebbles in river shingle. The upper photo is of a red ‘fortification’ agate with centre of crystalline amethystine quartz.

(Figure 62) Top left: Sign at entrance to Beltingham Nature Reserve; Top right: Spring sandwort; Bottom left, Alpine pennycress; Bottom right: Thrift.

(Figure 63) Synclinal fold formerly exposed in the Great Limestone at Mootlaw Quarry. Note how the bedding in the upper part of the mudstones overlying the fold is apparently unaffected.

(Figure 64) Monoclinal fold in the Great Limestone at Crindledykes Quarry.

(Figure 65) Trace fossils in sandstone at Hindleysteel Quarry, Henshaw Common.

(Figure 66) Sketches of some characteristic graptolites from the Coquet Head Inlier. 1 *Monograptus priodon*, 2 *Monograptus riccartonensis*, 3 *Monograptus flemingii*.

(Figure 67) A — Crinoid, Woodocrinus sp. B — Goniatite C — Brachiopod, Spirifer bisulcatus group.

(Figure 68) Extracting and crushing rock for aggregate at Barrasford Quarry; the near-horizontal bedded rocks behind the excavator are metamorphosed Oxford Limestone.

(Figure 69) Roadway in underground workings of the Little Limestone Coal at Blenkinsopp Colliery photographed in 2002 © Joel Porter.

(Figure 70) Stock piles of witherite at Settlingstones Mine in 1967.

(Figure 71) Barrasford cottages.

(Figure 72) Houses built from local sandstone in Front Street, Glanton.

(Figure 73) Abandoned millstones in Prudham Sandstone Quarry.

(Figure 74) Hole Bastle, near Bellingham, constructed from random rubble sandstone with roughly dressed larger blocks used for corner stones and surrounds to openings. The flagstone roof is typical of those once common in southern parts of the district.

(Figure 75) Glanton Pike Sandstone Quarry, photographed in 1928.

(Figure 76) Blocks of sandstone stockpiled in Millknock Quarry awaiting processing.

(Figure 77) The working face at Cop Crag Quarry near Byrness showing the highly distinctive yellow-orange colour of the sandstone. The massive thick sandstone beds are split by inserting a series of parallel vertical drill holes and black powder blasting, visible on the quarry face in front of the figure.

(Figure 78) Building stones quarries table.

(Figure 79) Volcanic rocks exposed in the River Coquet near Shillmoor Farm © Graeme Peacock https://www.graeme-peacock.com/.

(Figure 80) Vibrator vehicles operating in Northumberland during a seismic survey in the late 1980s. Large pads are lowered onto the road surface and a radio signal is sent which induces a vibration into the ground from each pad.

(Figure 81) Guided walk exploring the landscape above Walltown © NNPA.

(Figure 82) Walltown. The hard rock trail booklet.

(Figure 83) The Lordenshaw rock, a panel of rock art cut into the Fell Sandstone; looking north-west towards the Cheviots © Graeme Peacock https://www.graeme-peacock.com/.

(Figure 84) The opening into the pot at Great Tosson Limekiln.

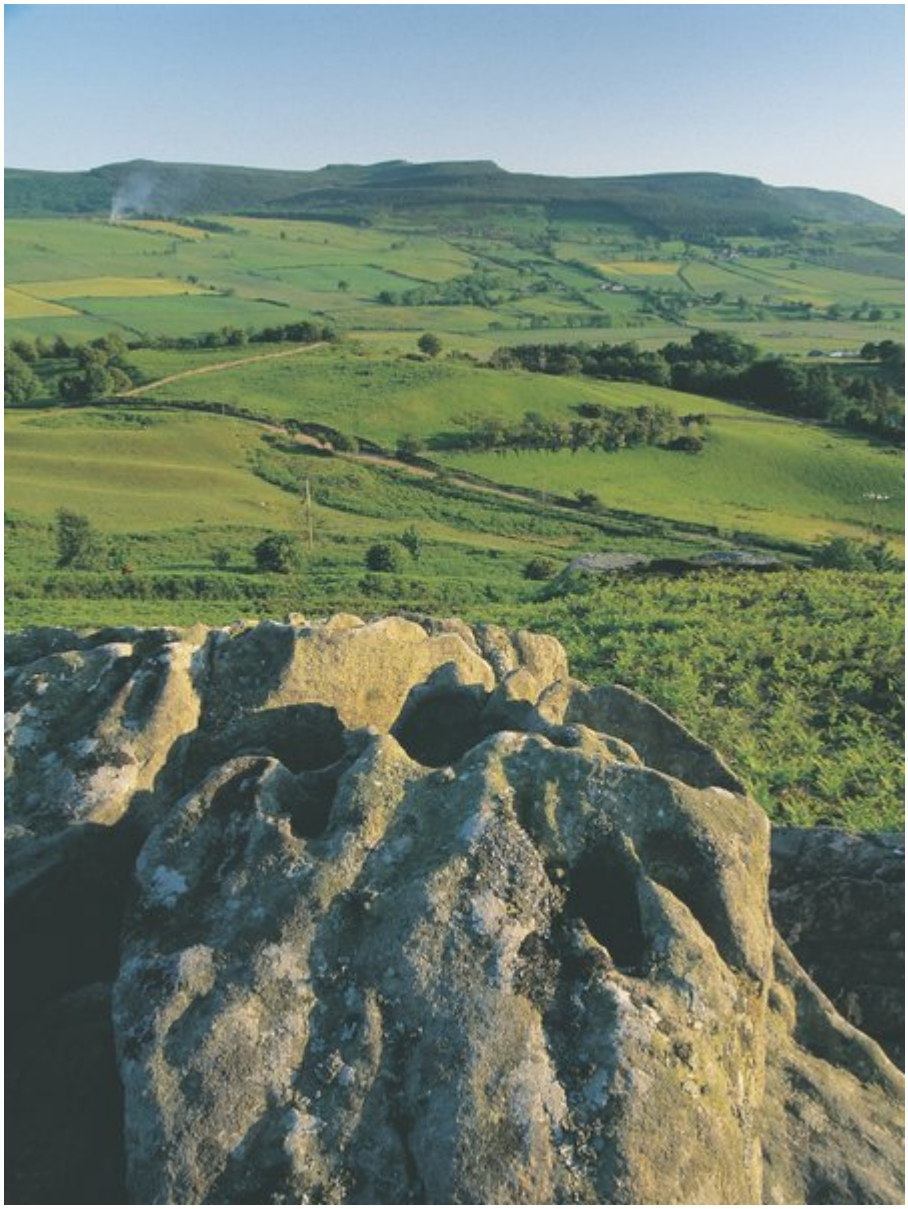
(Figure 85) Old quarry in the Whin Sill at Walltown Crags © Graeme Peacock https://www.graeme-peacock.com/.

(Figure 86) Geodiversity sites in Northumberland National Park and the surrounding area.

(Figure 87) Coverage of BGS 1:50 000 scale geological maps and explanatory memoirs for the district.

(Front cover) Cover images clockwise from top left: Hadrian's Wall above cliffs of Whin Sill, looking west towards Crag Lough © Graeme Peacock. The Drake Stone, a huge Fell Sandstone boulder near Harbottle BGS © NERC. Caw■elds Quarry in the Whin Sill, now a recreation area © Graeme Peacock. Looking south-west from Long Crags towards the granite hills of Hedgehope and Cheviot © Graeme Peacock https://www.graeme-peacock.com/.

(Location map) Location map for the district described in this book.



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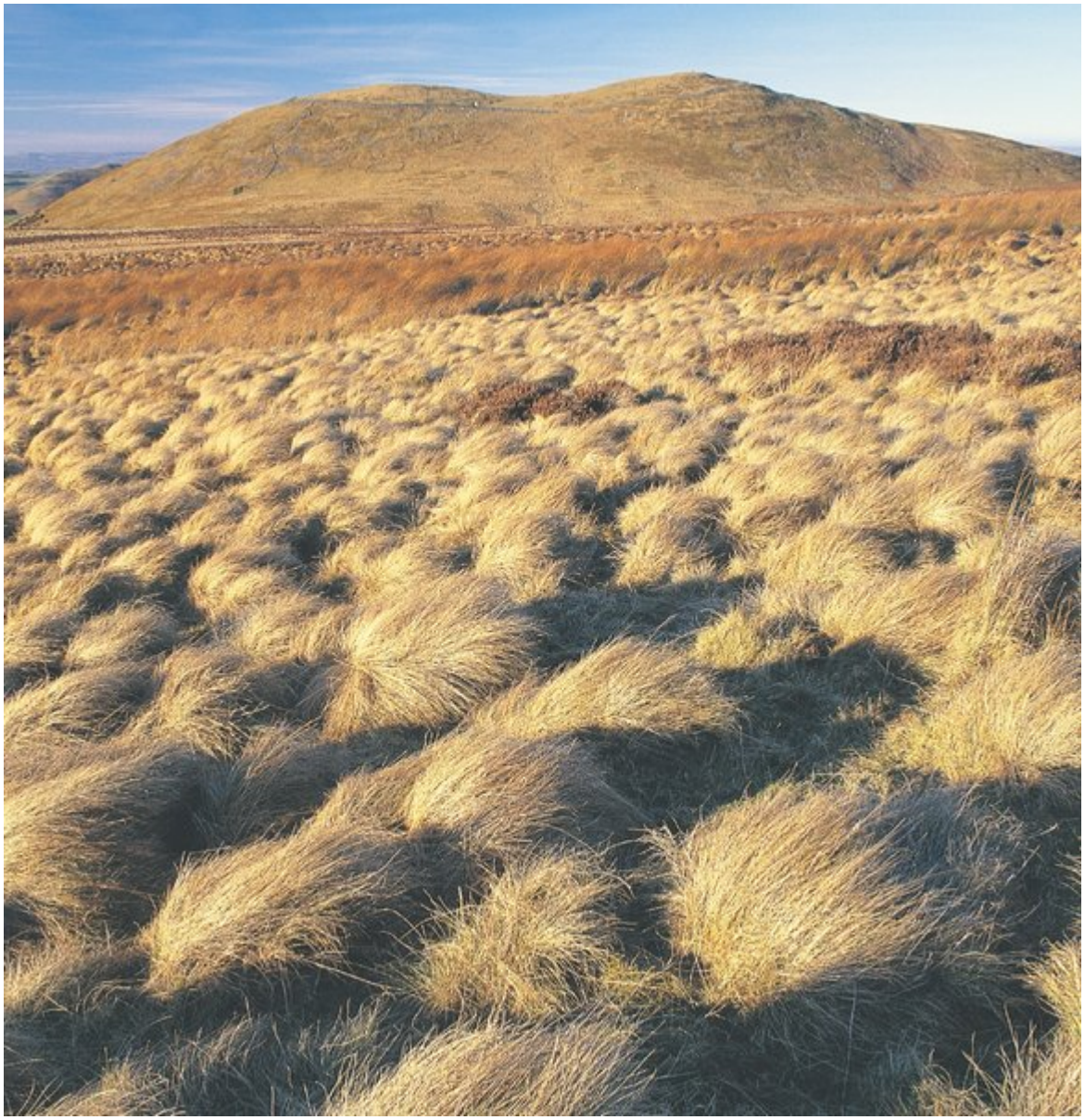

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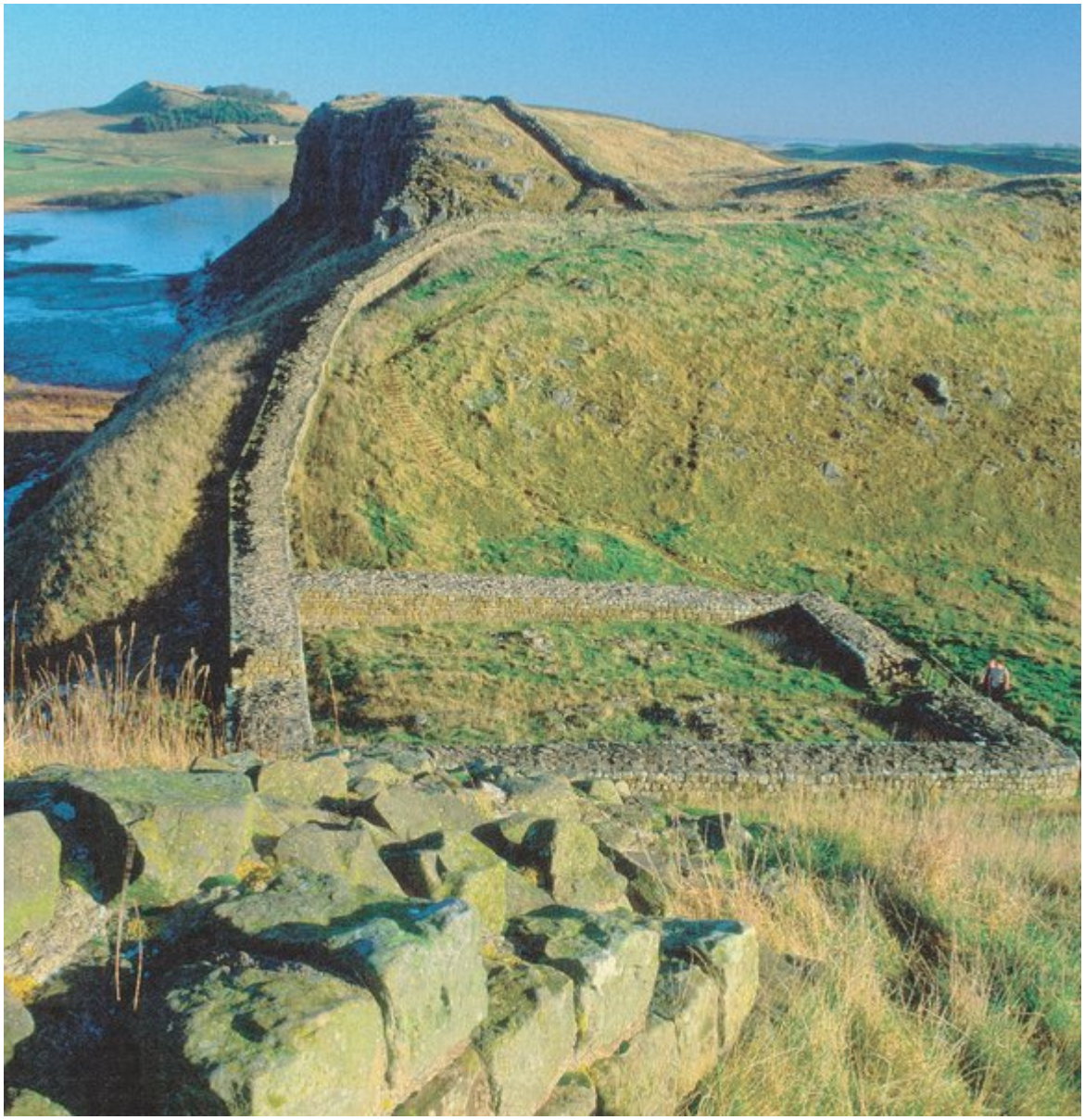

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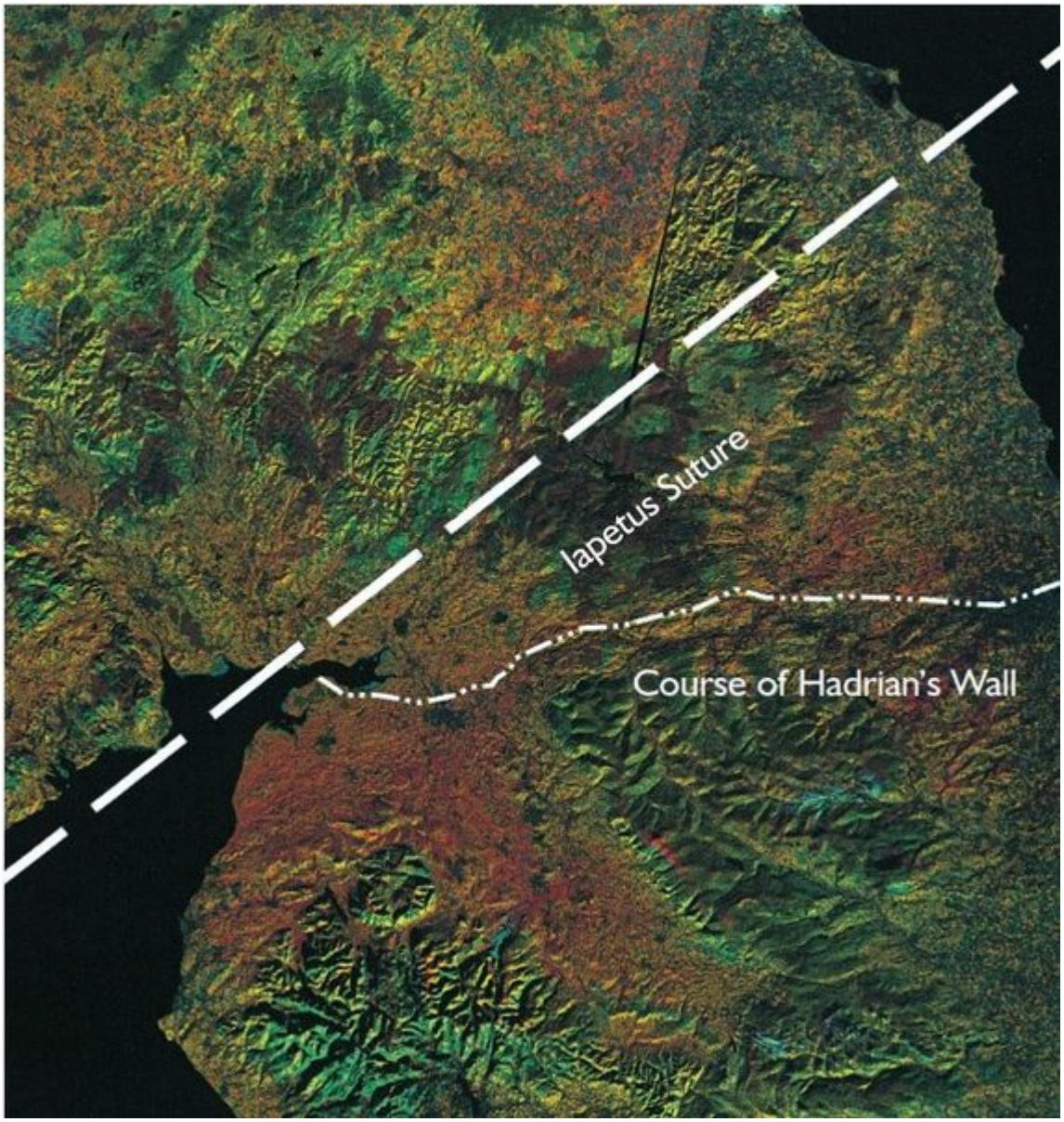

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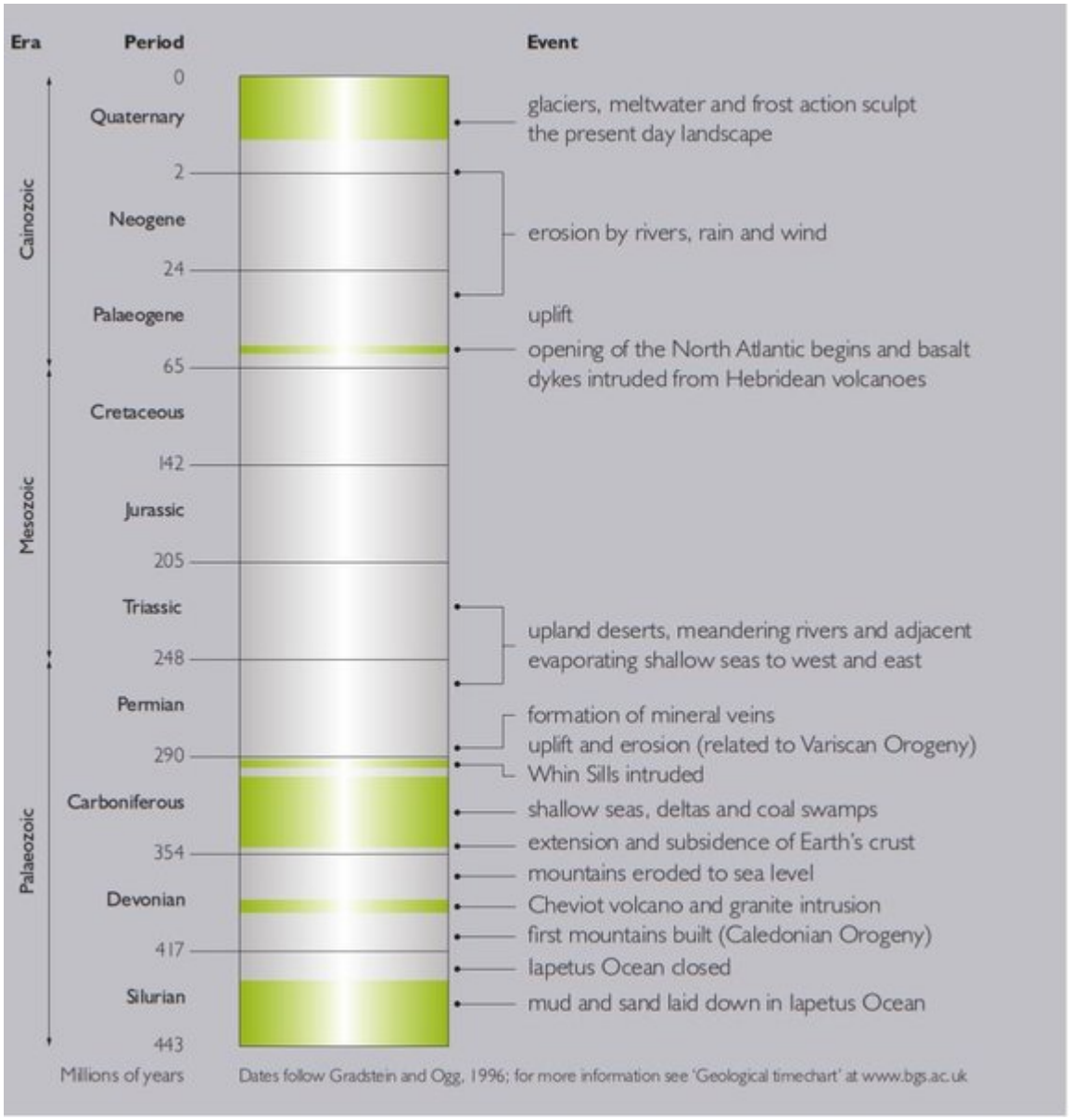

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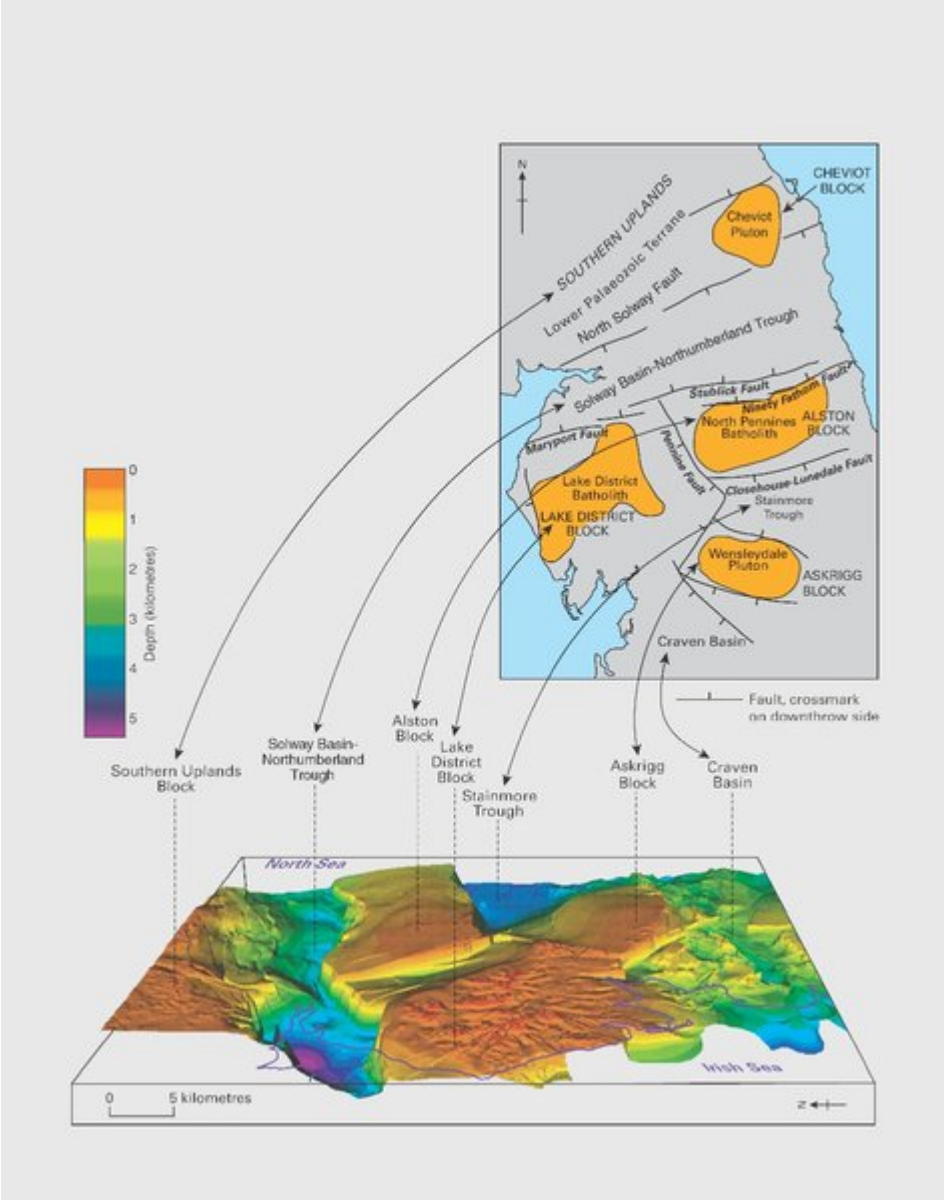

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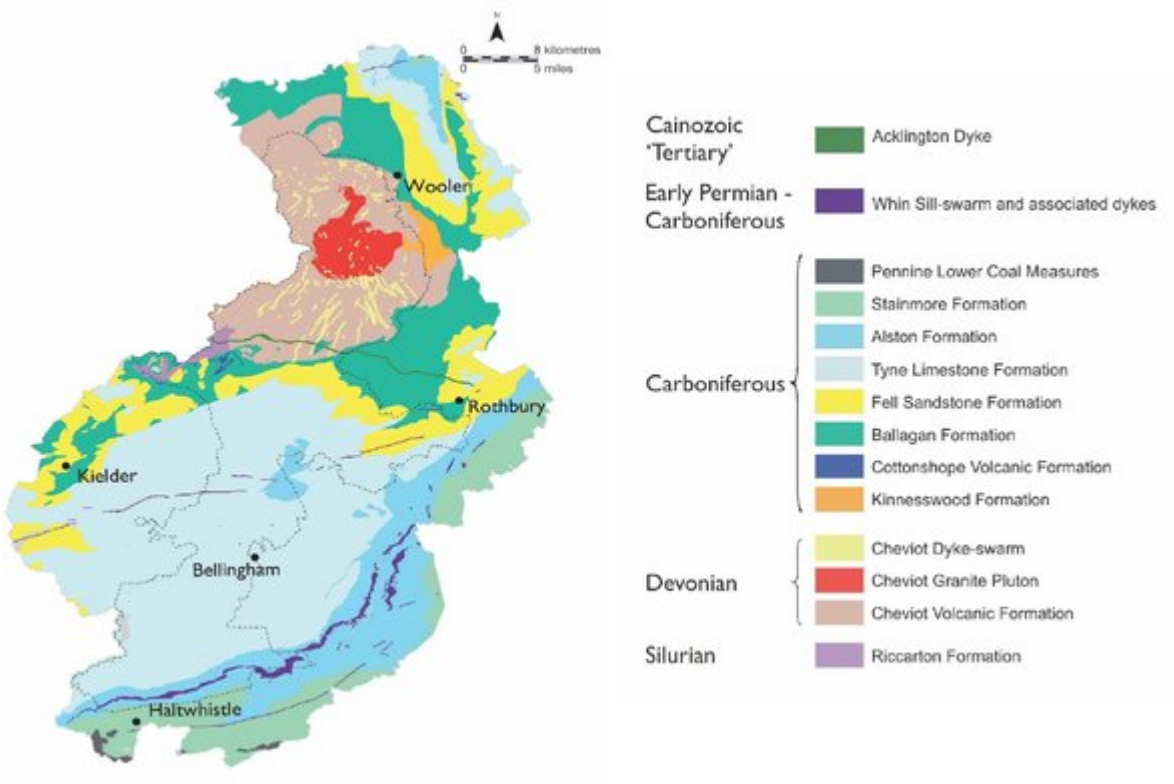

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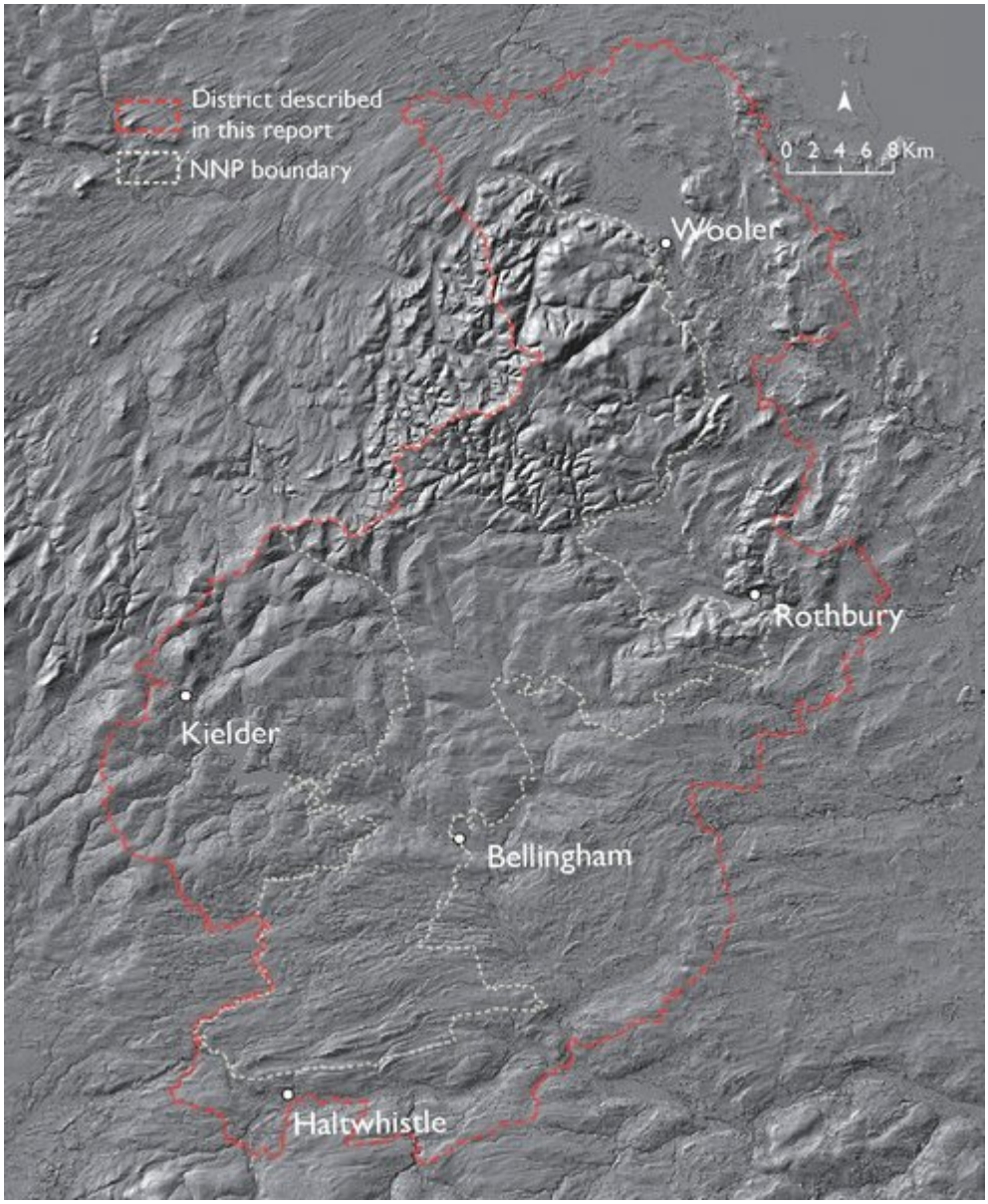

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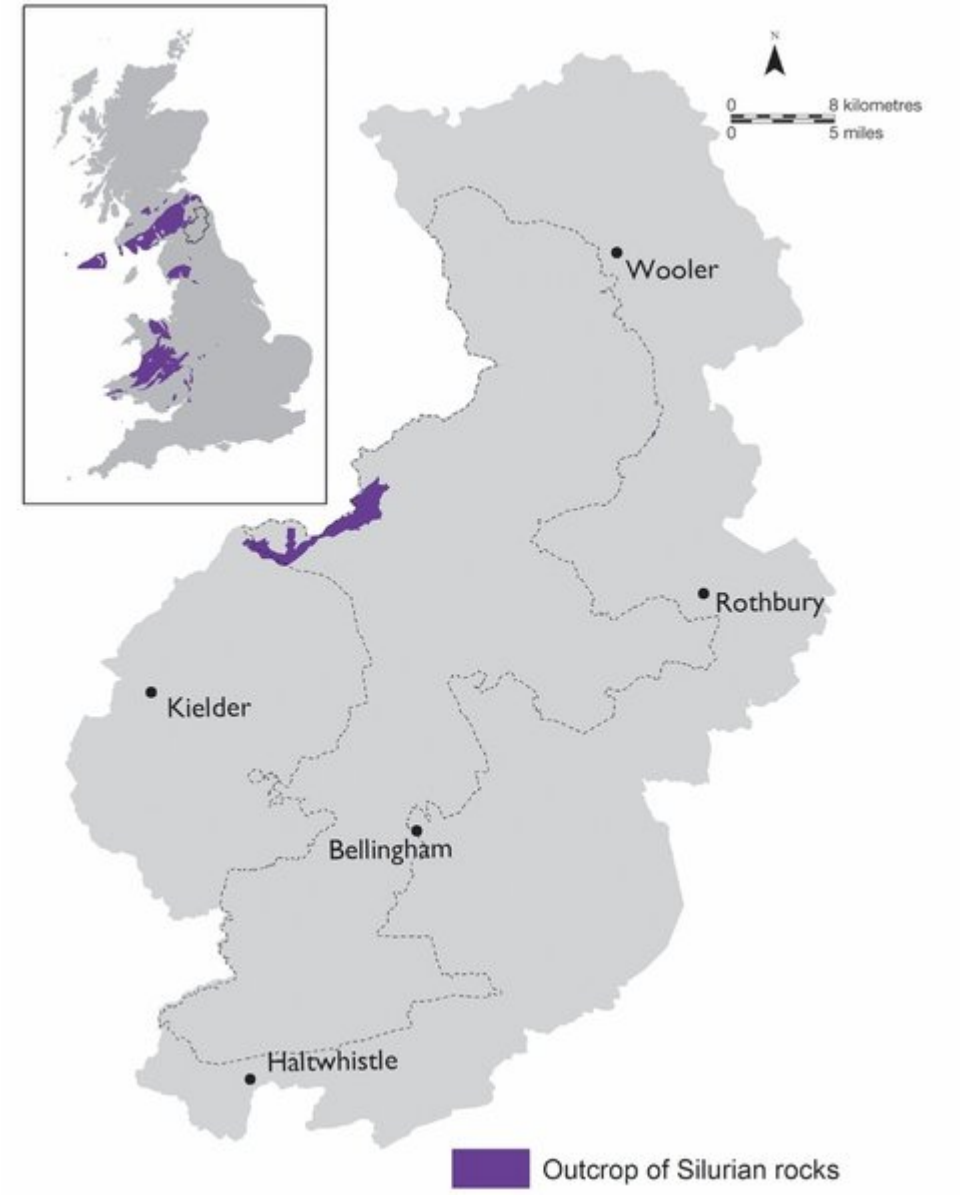

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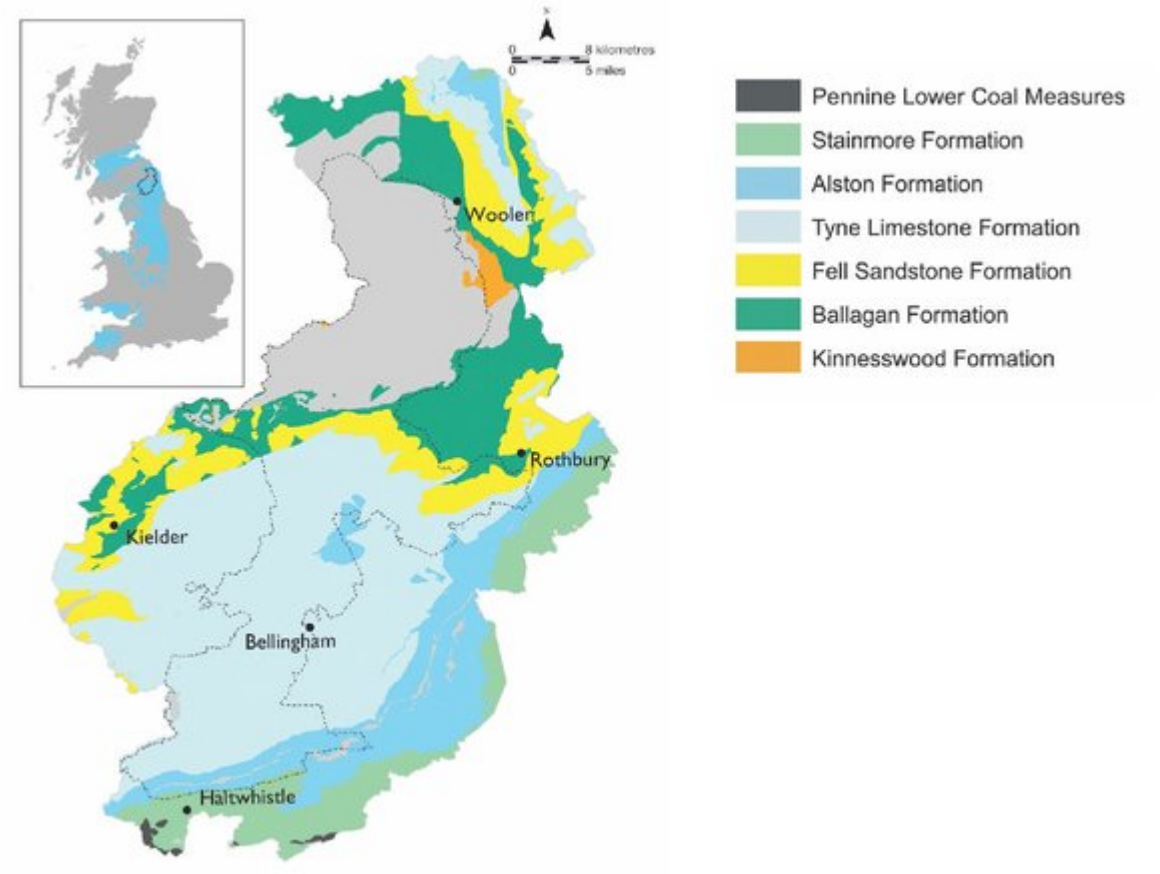

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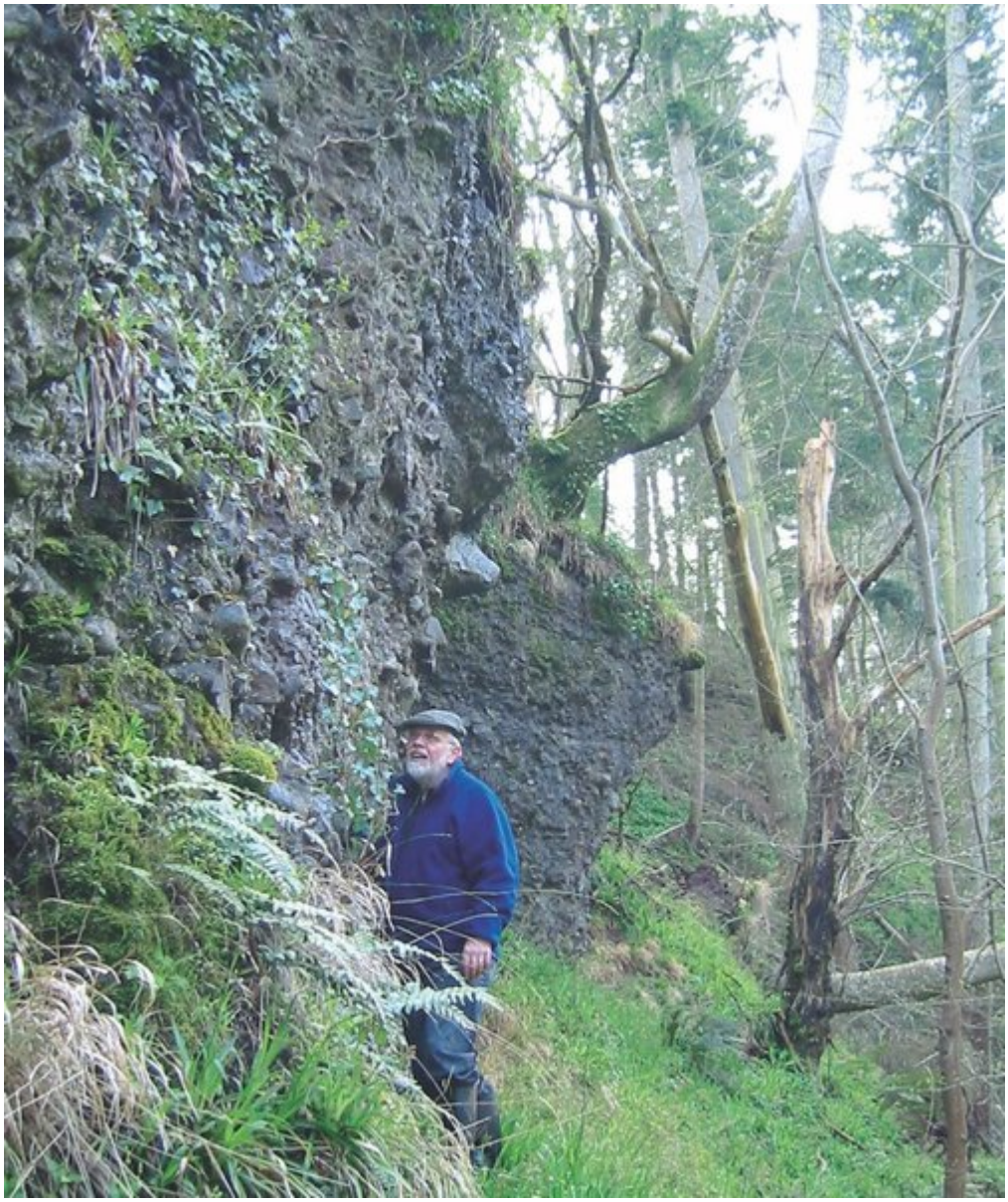

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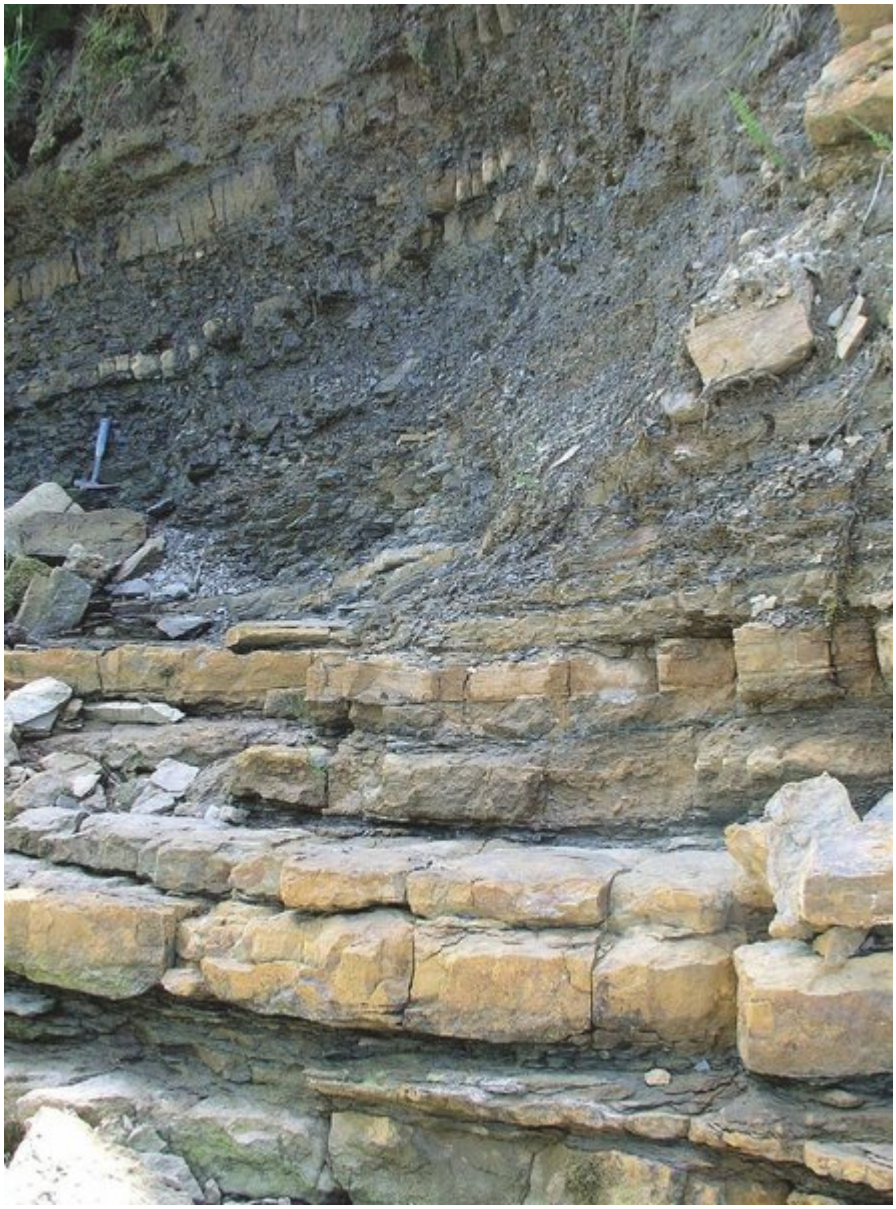

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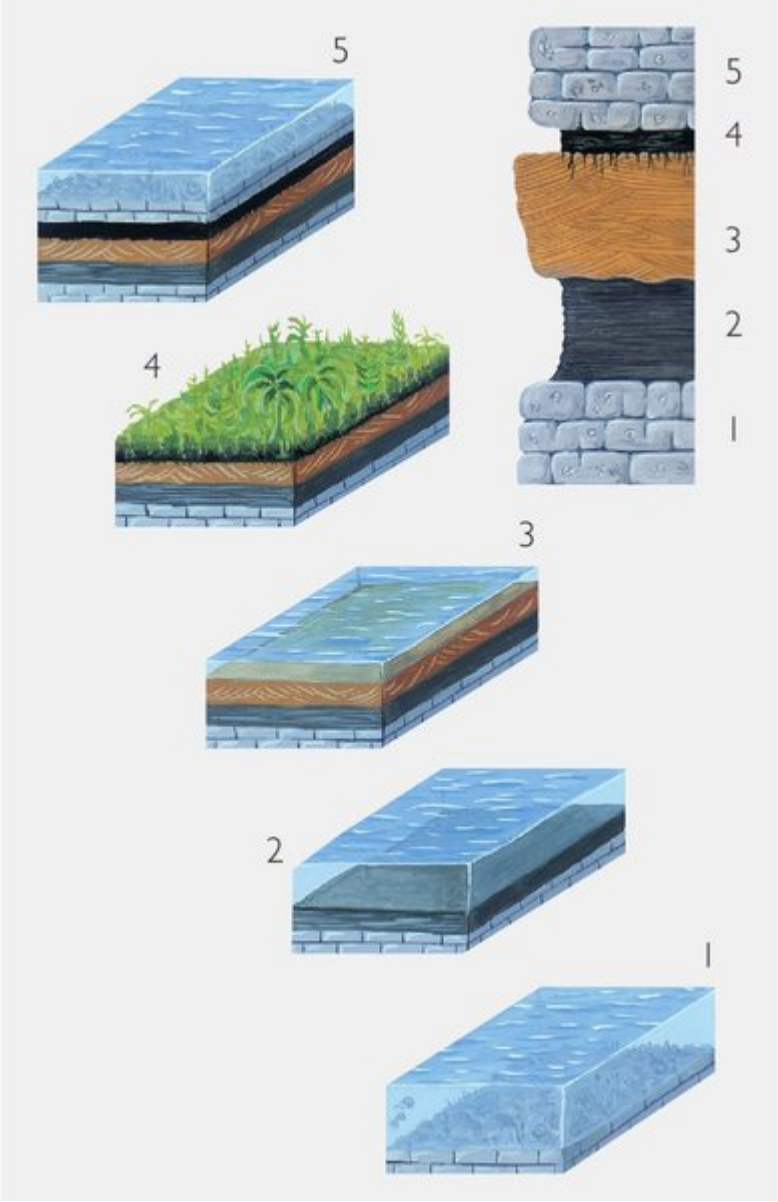

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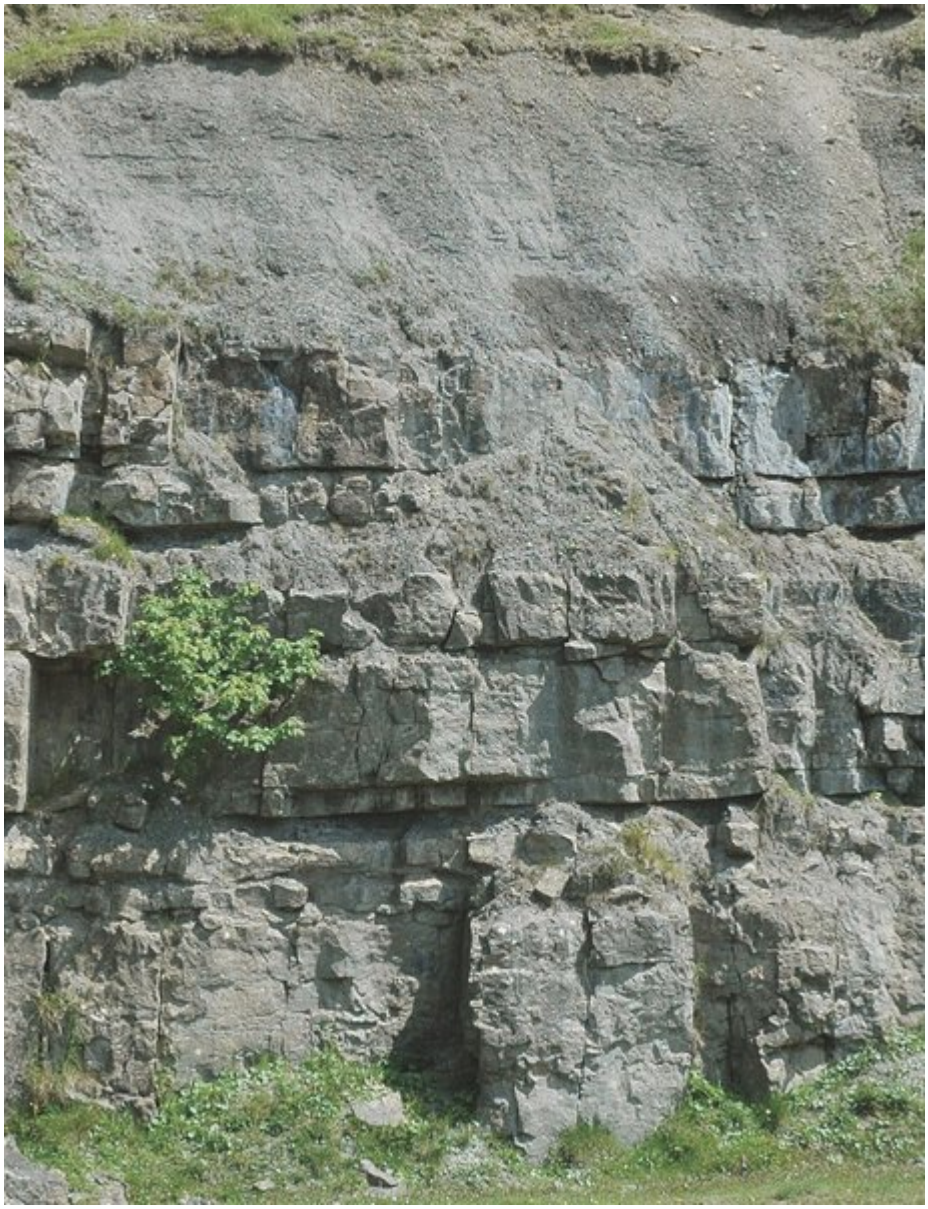

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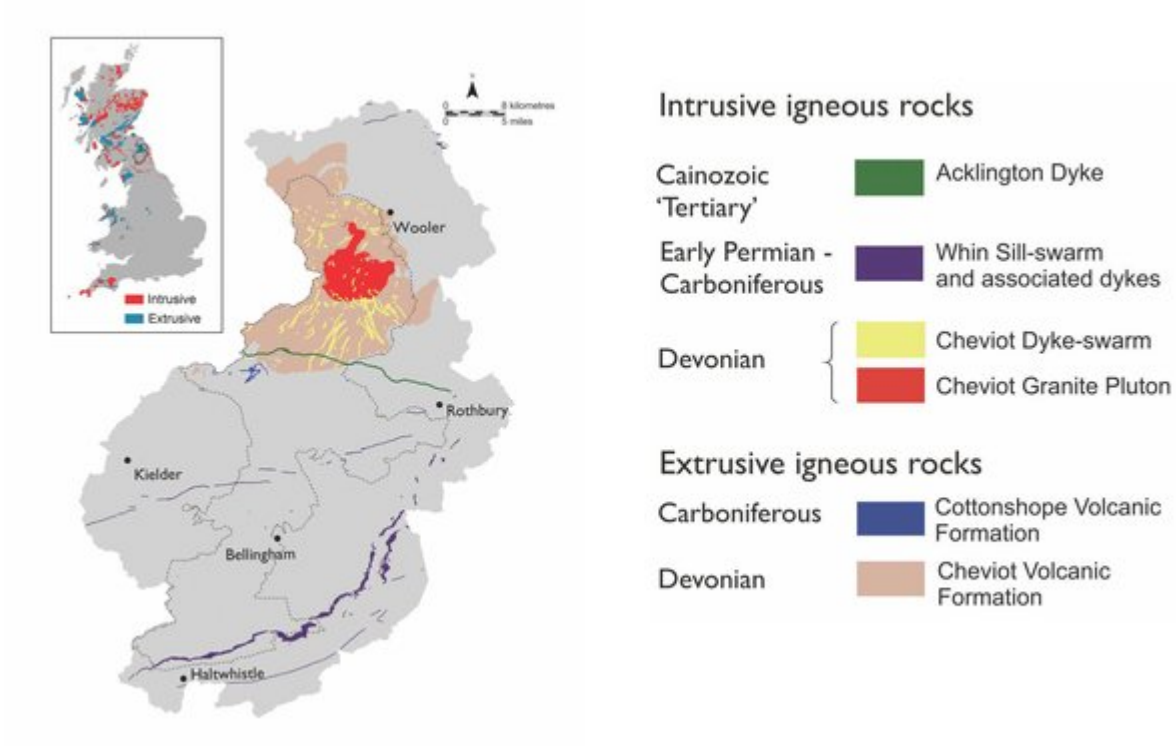

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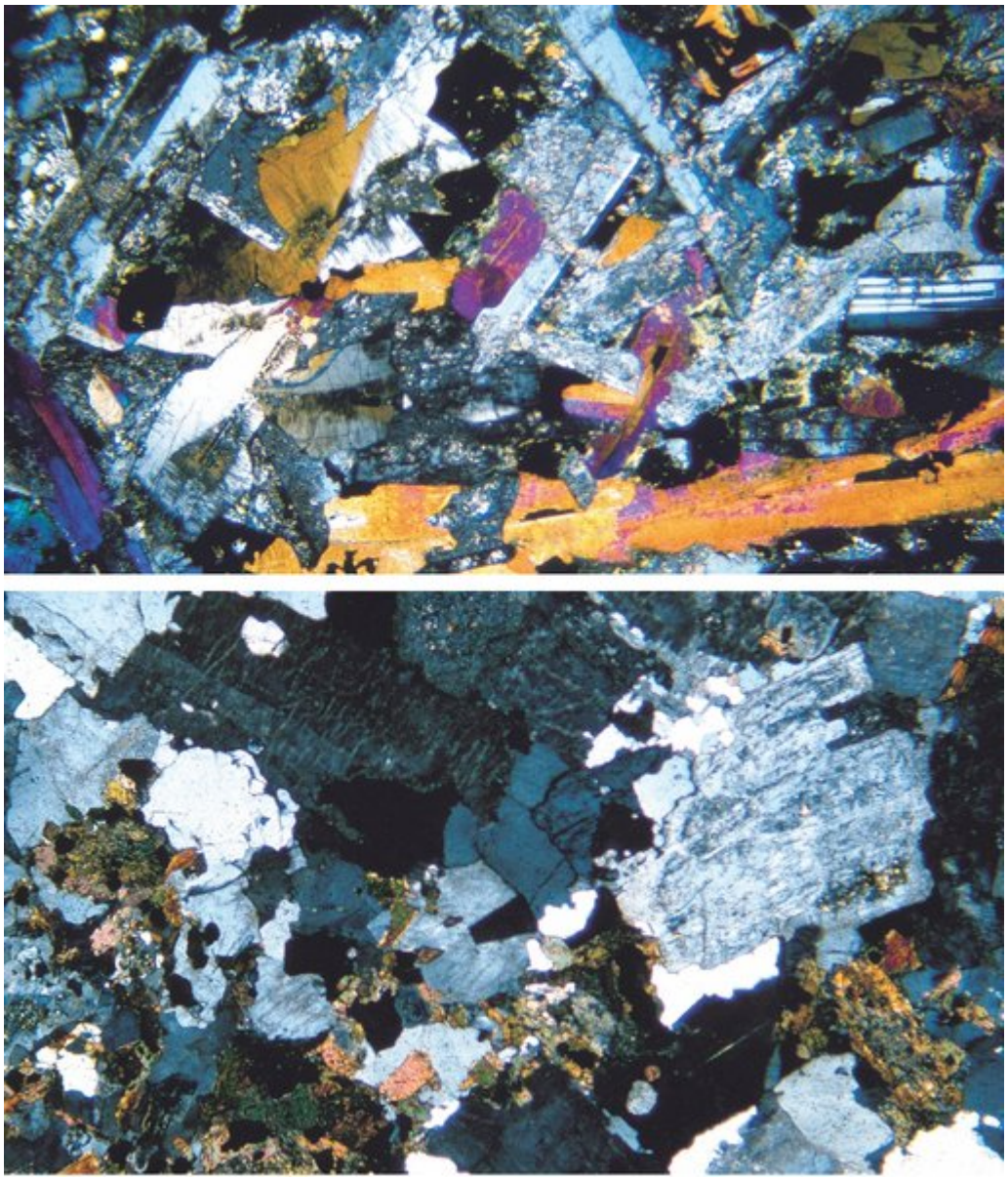

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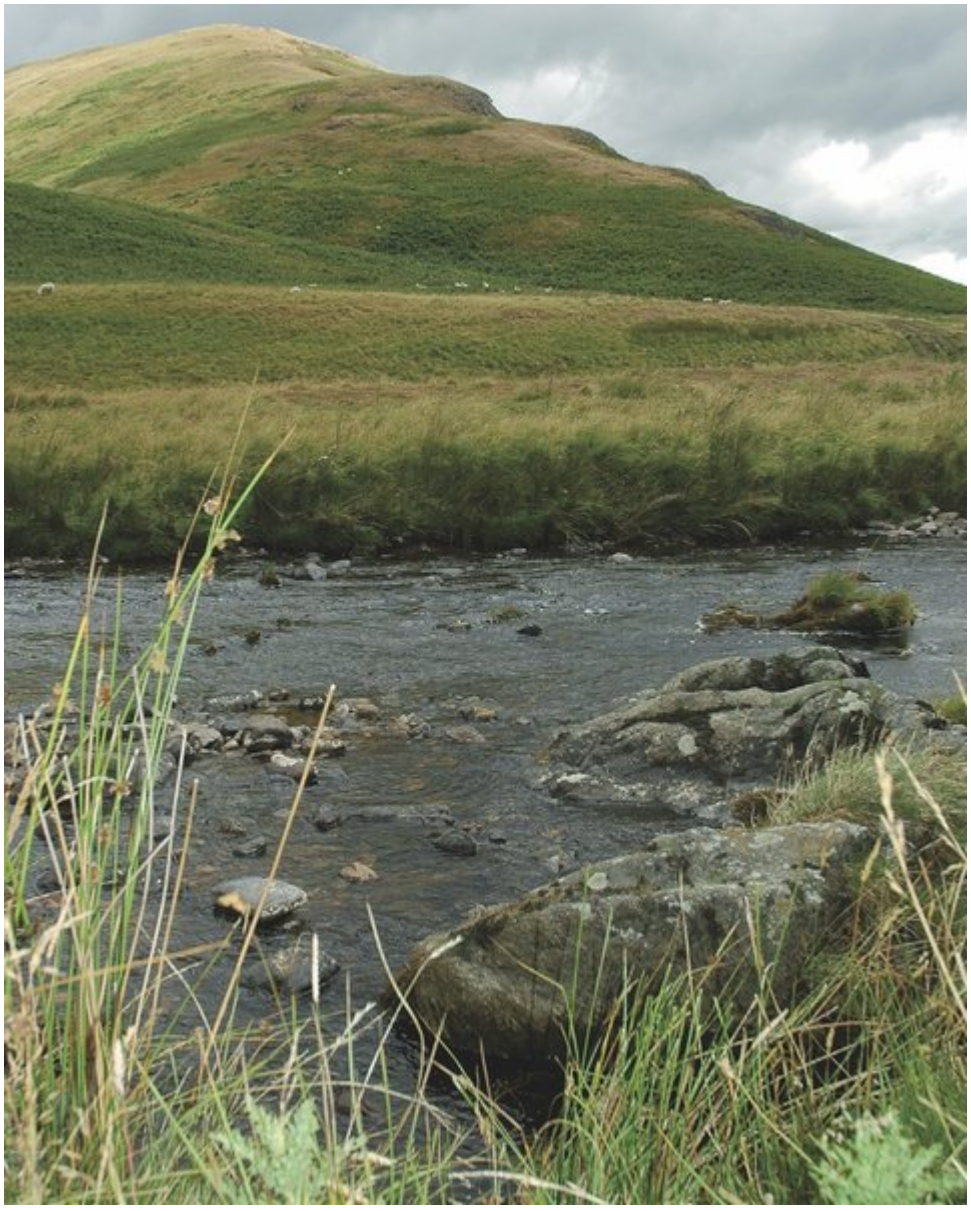

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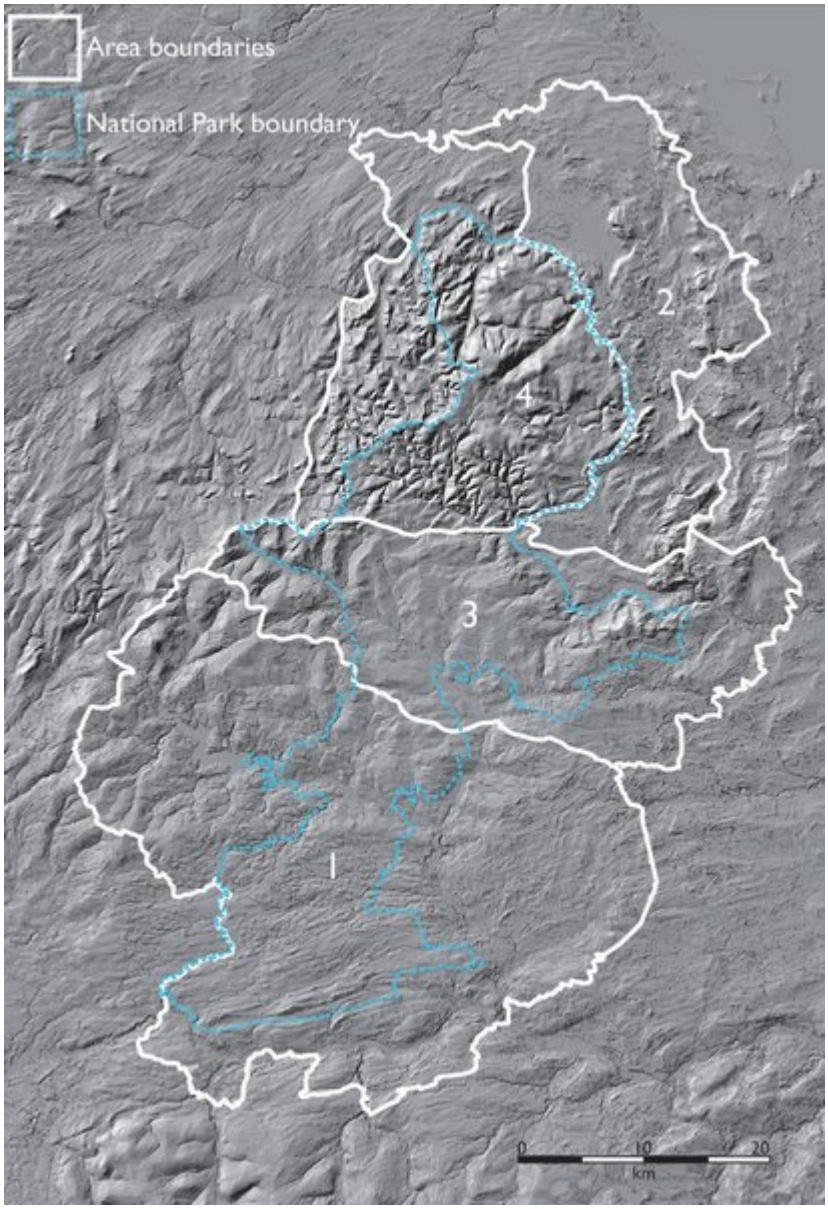

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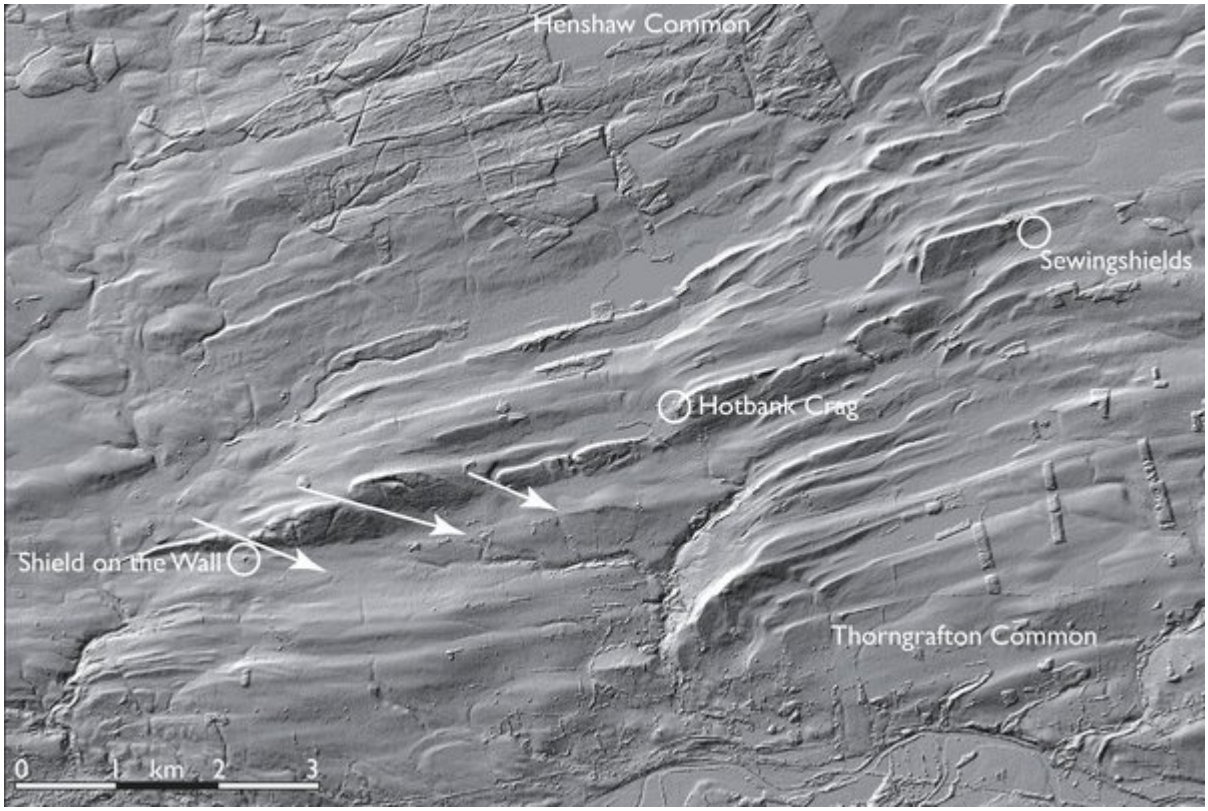

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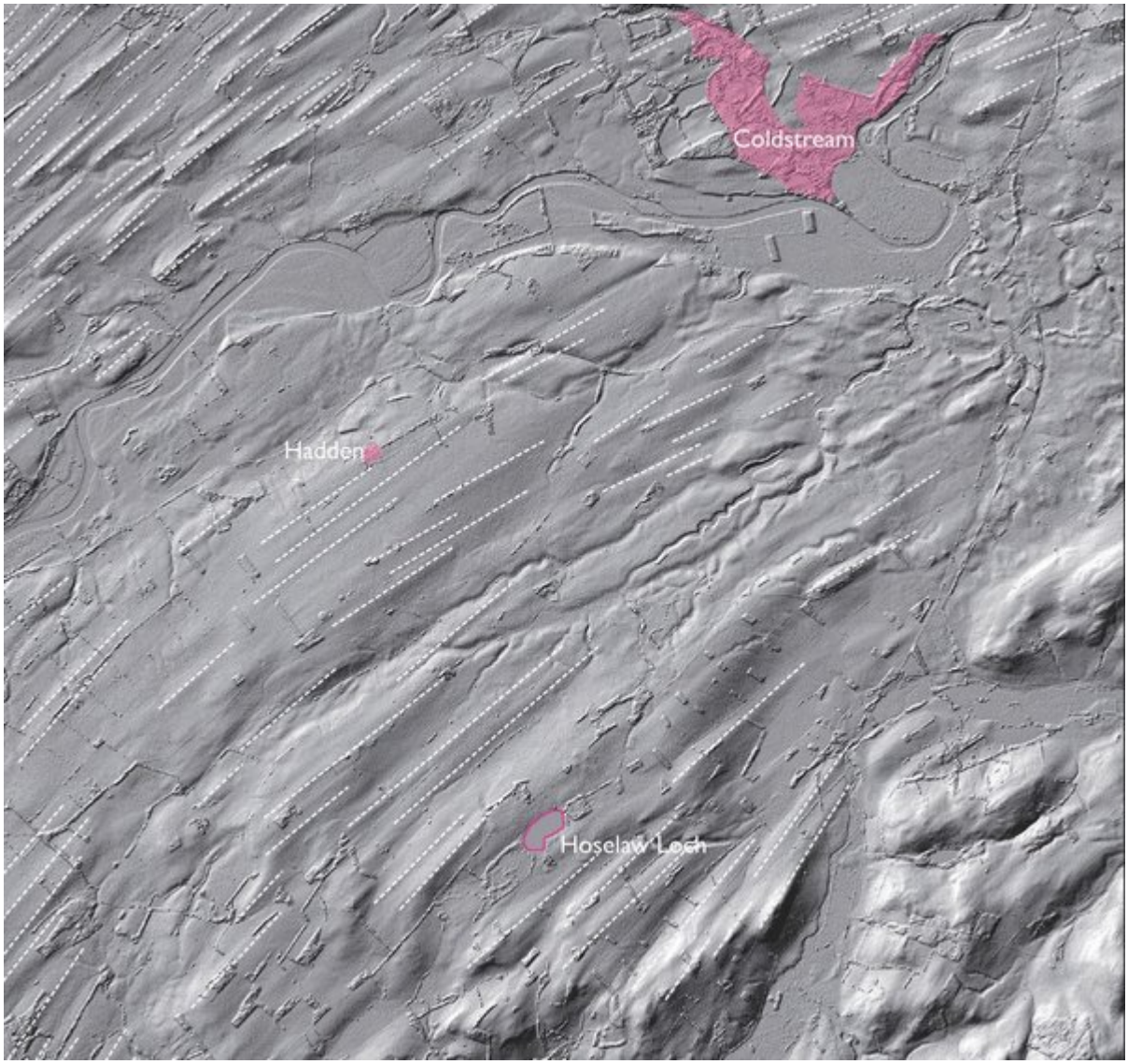

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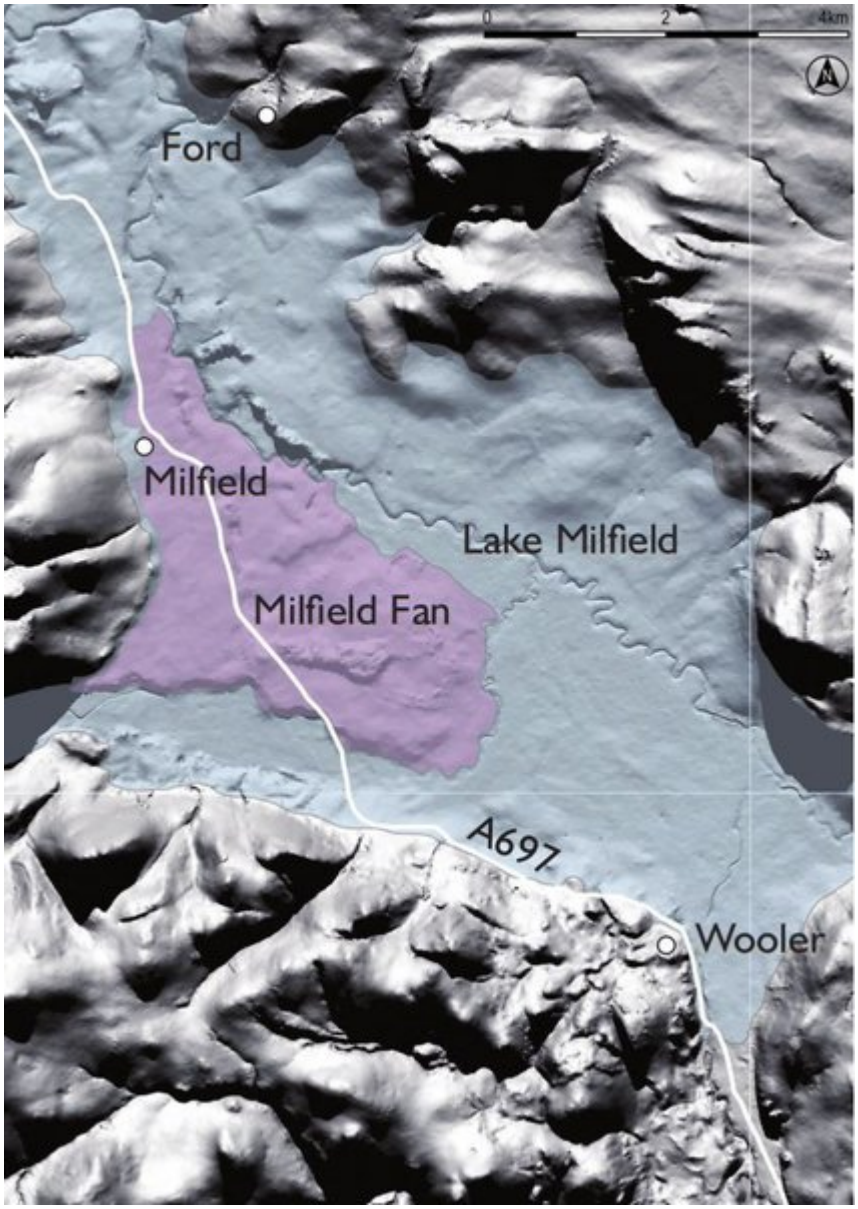
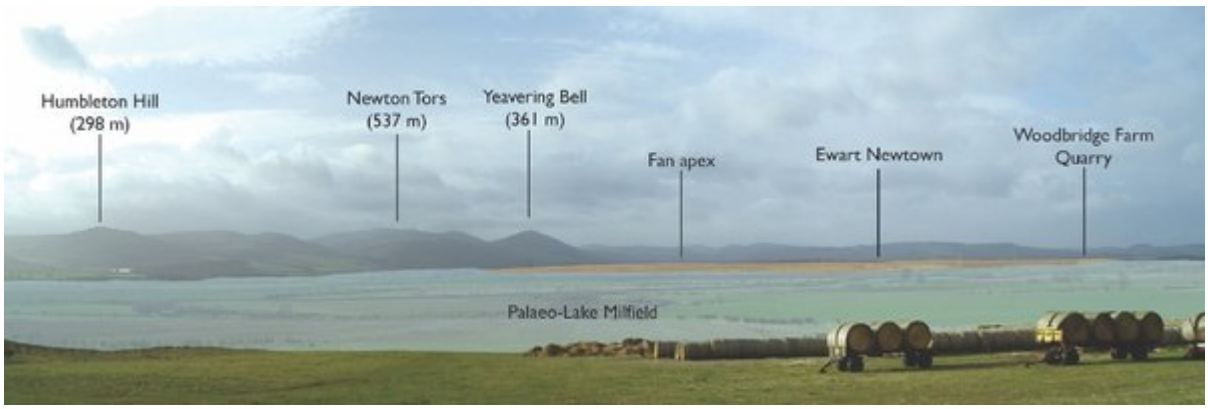


(Figure 46) Reconstruction of palaeo-Lake Milfield, with area of extant glaciofluvial fan at Milfield. Fan apex is at 55 metres OD, therefore the lake shoreline has been drawn at 60 metres. Water levels will have fluctuated throughout the life of the lake (Hillshade image derived from NEXTMap® © Intermap Technologies Inc.).



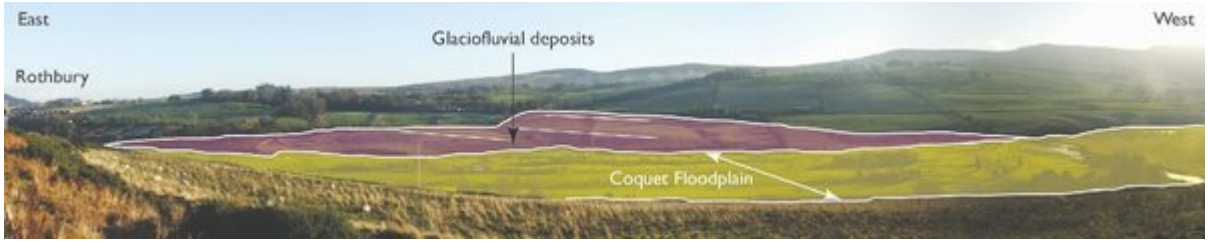
(Figure 47) View from south of Doddington, looking west. Simplified reconstruction of palaeo-Lake Milfield, showing probable lake extent (blue) and location of fan (brown).

(Figure 48) Ice-wedge cast in section at Woodbridge Farm Quarry. Ice wedges form under intensely cold conditions, as water freezes in vertical cracks in soils, and repeated freeze-thaw cycles widen the crack, into which larger debris is sorted by the freezing and thawing, causing swelling and shrinking of the soil.

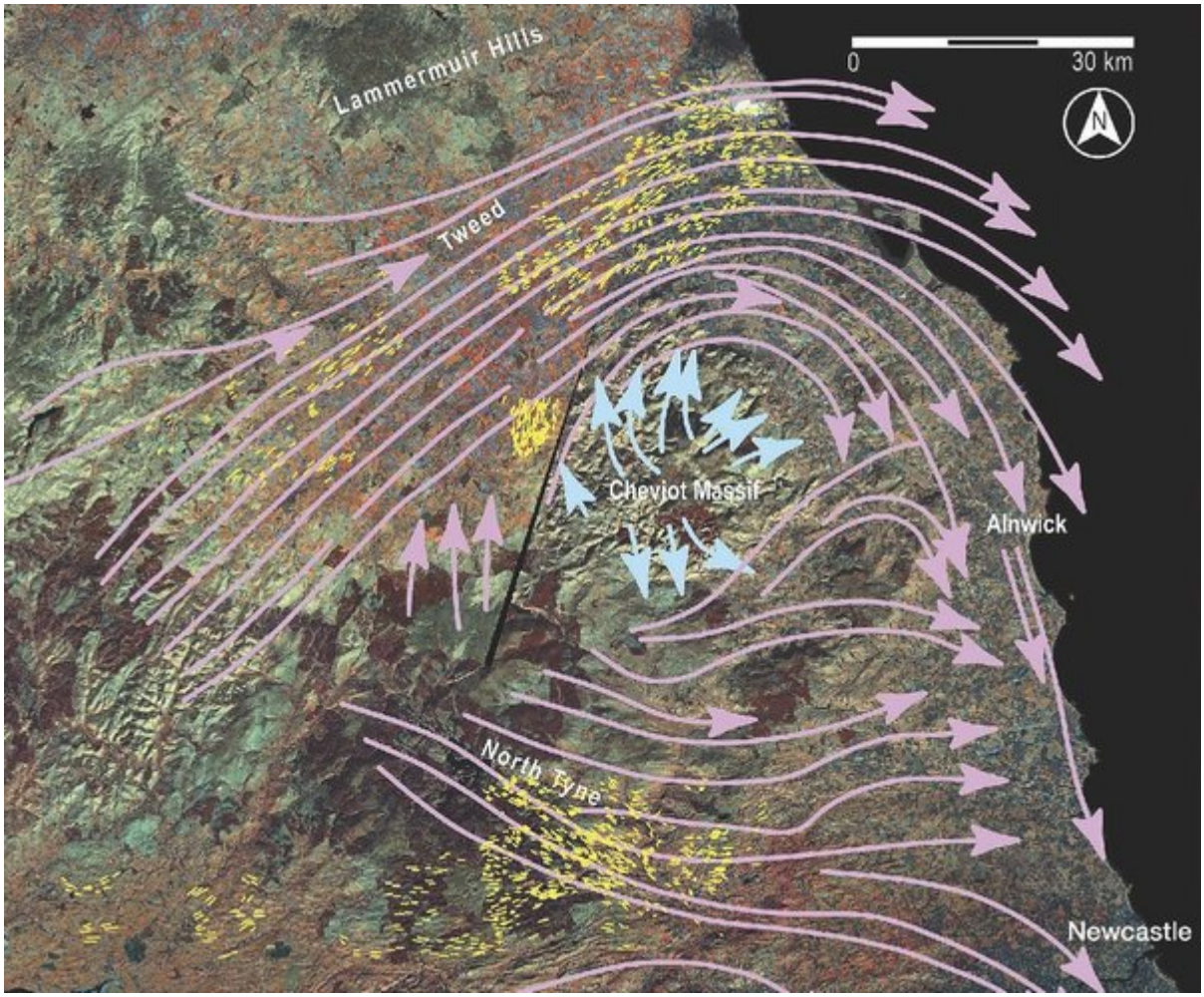
(Figure 49) Ripple cross-bedded sands in section at Woodbridge Farm Quarry.

(Figure 50) Cobble gravels in section of River Breamish at Branton. Imbrication, or stacking of the clasts is clear, as is the less coarse alluvial deposit in the upper part of the section, relating to lower energy flow regimes. These most likely occurred long after the coarse material was deposited by glacial meltwater flow. Subsequent late Holocene activity has seen downcutting through the older deposits.

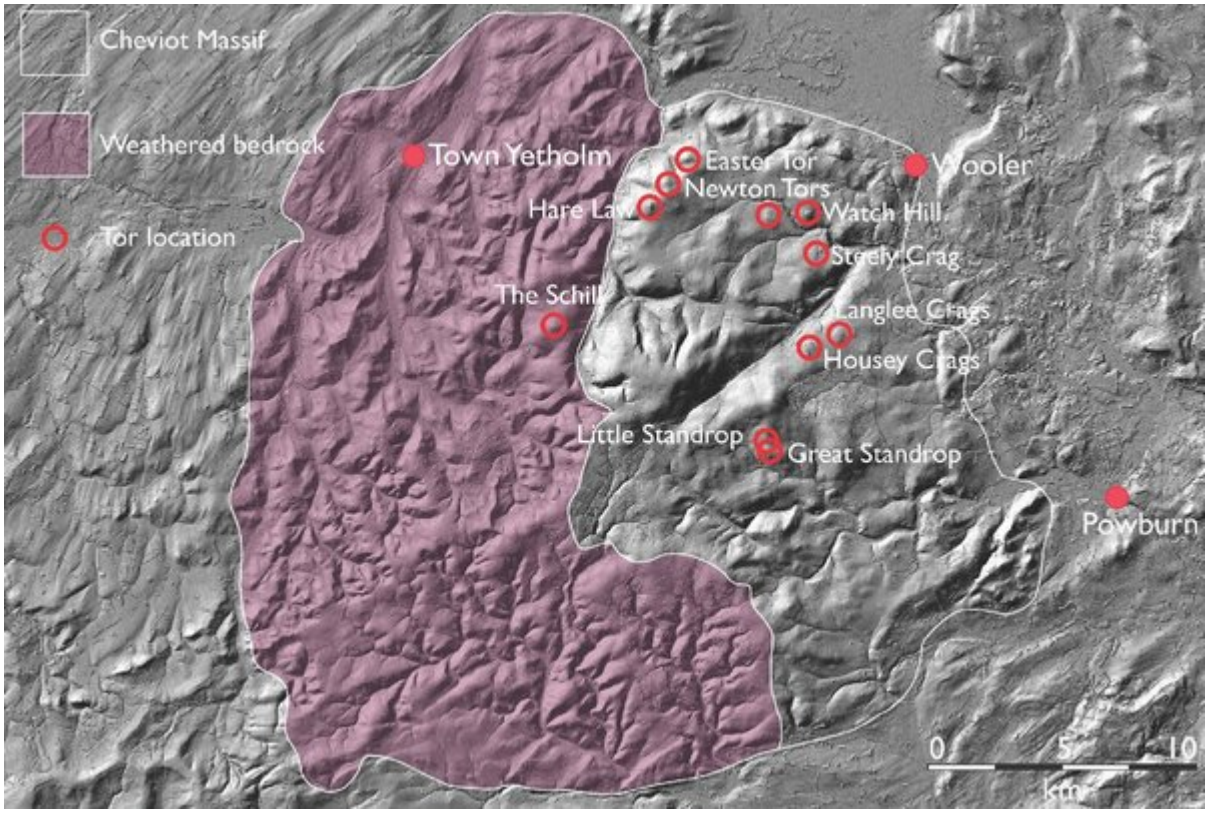
(Figure 51) Panoramic view from near Glanton Pyke, looking southwards toward Whittingham. The ridges marked 'a' and 'b', are clearly visible on the valley floor and were probably formed by glaciofluvial outwash processes.



(Figure 52) View from Pondicherry near Rothbury, looking southwards over the Coquet floodplain. Recent Holocene fluvial activity has ensured the floodplain has remained active. Low relief, linear ridges of glaciofluvial deposits are visible on the southern side of Coquetdale.



(Figure 53) Proposed flow regime in the Cheviot region (after Clapperton, 1971), with cold- and warm-based ice shown by blue/pink colouration of arrowed flowlines. Position of mega-scale glacial lineations shown in yellow (Clark et al., 2005). After Everest et al., 2006.

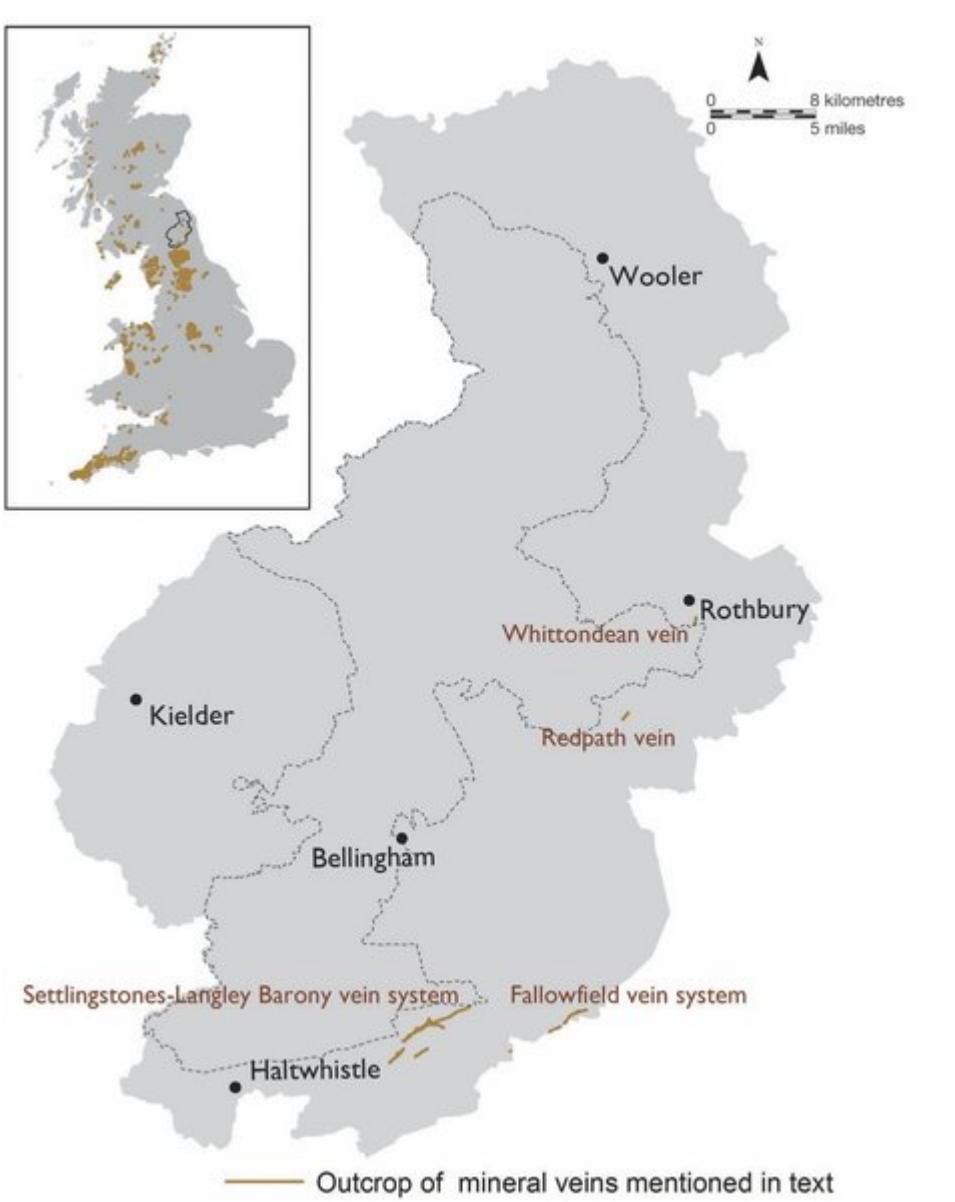


(Figure 54) Distribution of in situ weathered bedrock and tor features in the Cheviot massif (Hillshade image derived from NEXTMap® © Intermap Technologies Inc.).

(Figure 55) The tor developed in the Cheviot Granite at Great Standrop. The residual mass of rock appears as a pile of rock slabsThe tor developed in the Cheviot Granite at Great Standrop. The residual mass of rock appears as a pile of rock slabs.

(Figure 56) Section in deeply weathered bedrock near Hownam; clearly showing the preservation of primary igneous texture.

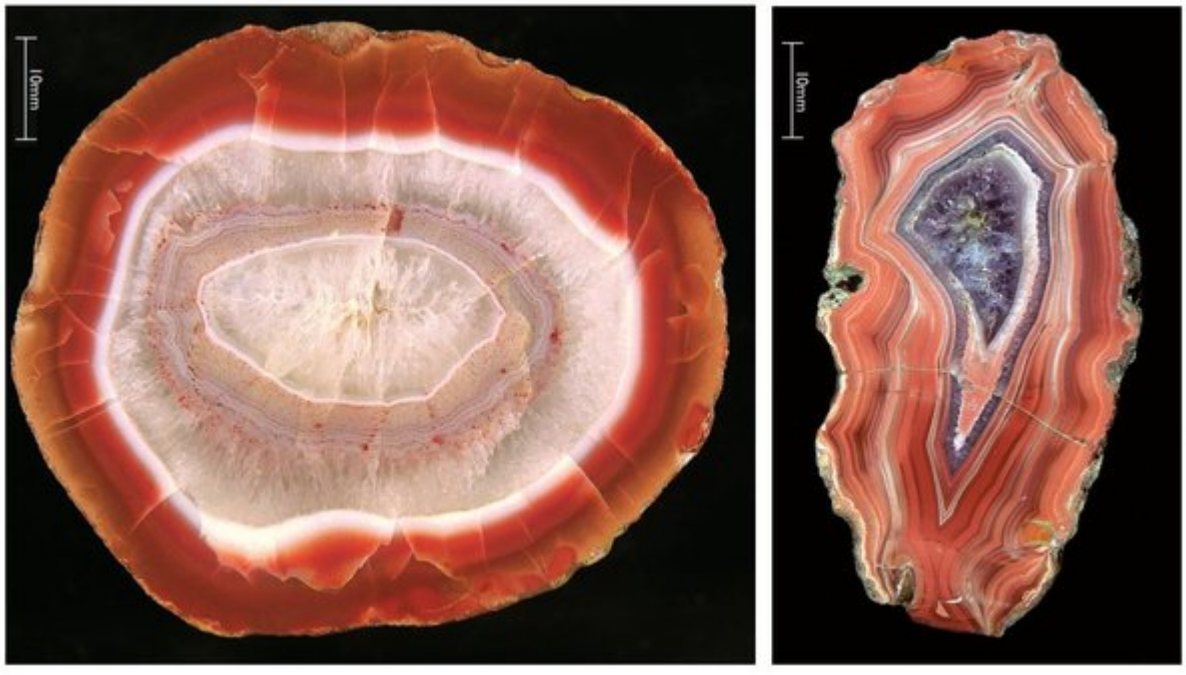
(Figure 57) A meltwater channel draining north-eastward from Ewartly Shank [NT 9644 1470].



(Figure 58) The distribution of mineral veins in the district; the inset map shows, highly simplified, the main areas in Great Britain where mineral veins occur.

(Figure 59) Witherite crystals from Fallowfield Mine.

(Figure 60) Alstonite crystals from Fallowfield Mine.



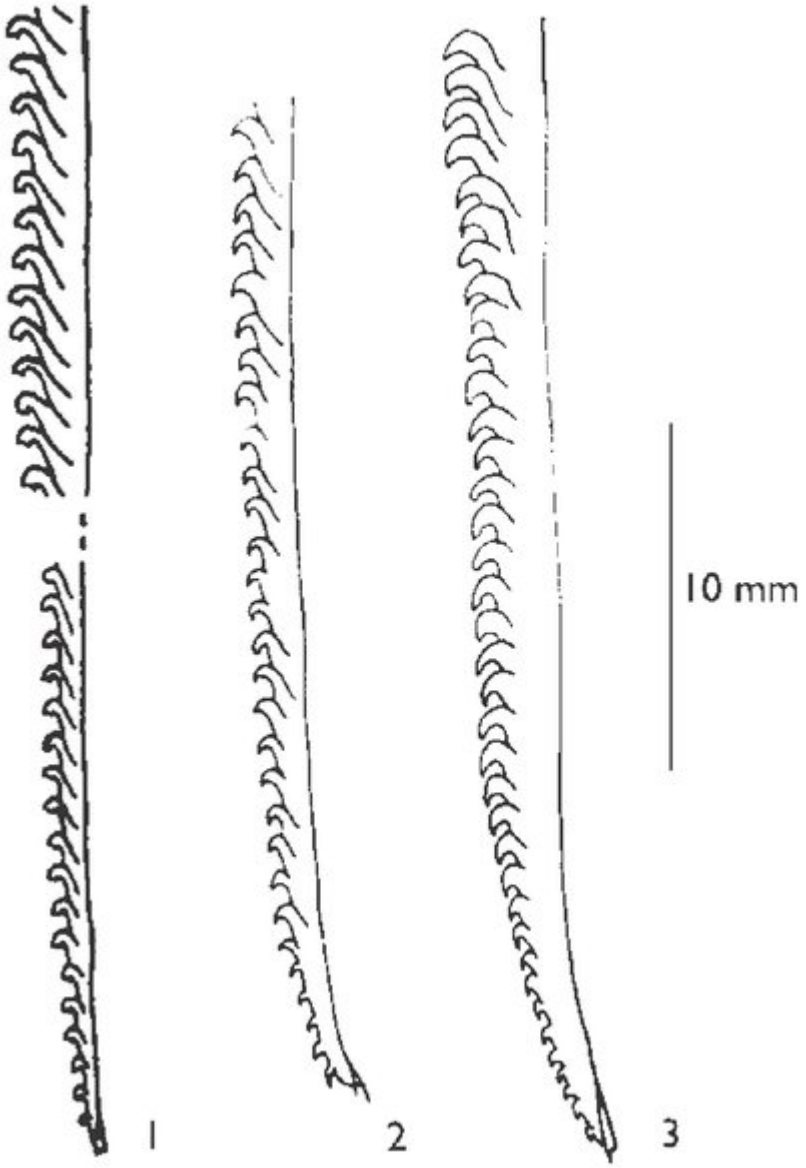
(Figure 61) Cut and polished surfaces of agates, from amygdales in Devonian age lavas of Cheviot volcanic rocks, found as pebbles in river shingle. The upper photo is of a red 'fortification' agate with centre of crystalline amethystine quartz.

(Figure 62) Top left: Sign at entrance to Beltingham Nature Reserve; Top right: Spring sandwort; Bottom left, Alpine pennycress; Bottom right: Thrift.

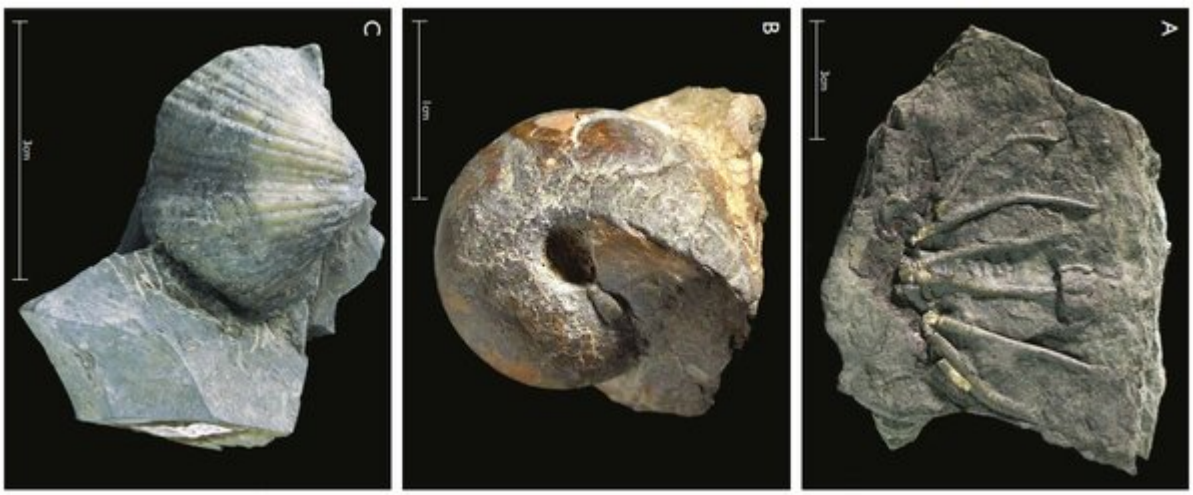
(Figure 63) Synclinal fold formerly exposed in the Great Limestone at Mootlaw Quarry. Note how the bedding in the upper part of the mudstones overlying the fold is apparently unaffected.

(Figure 64) Monoclinal fold in the Great Limestone at Crindledykes Quarry.

(Figure 65) Trace fossils in sandstone at Hindleysteel Quarry, Henshaw Common.

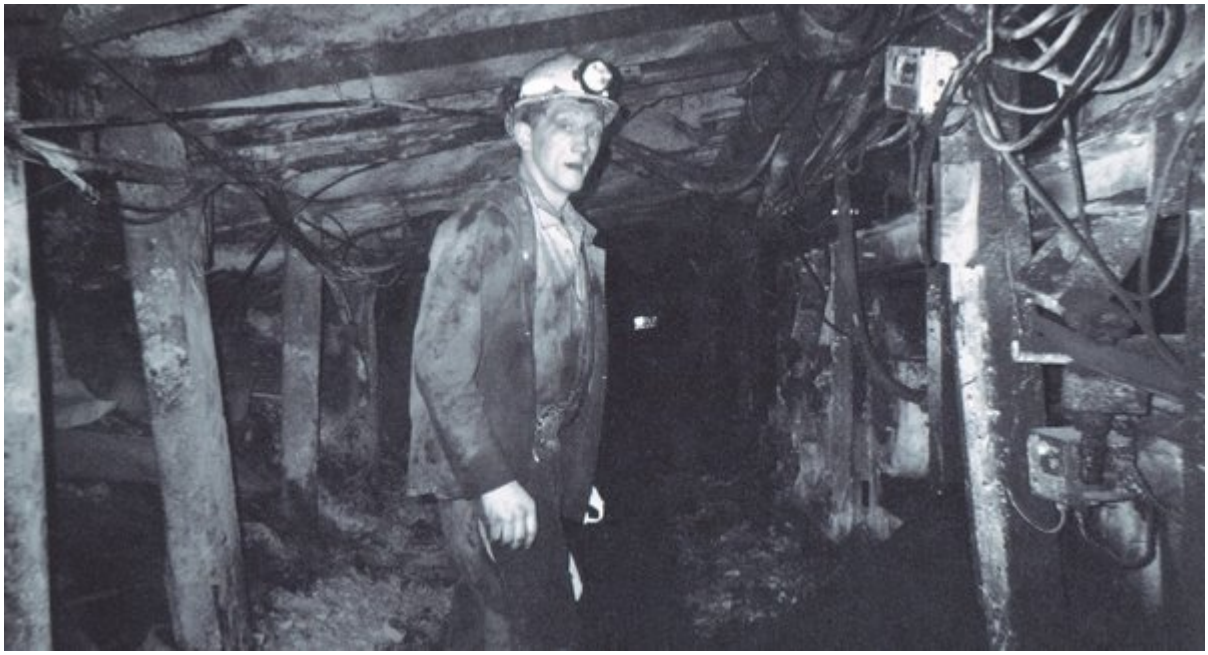


(Figure 66) Sketches of some characteristic graptolites from the Coquet Head Inlier. 1 Monograptus priodon, 2 Monograptus riccartonensis, 3 Monograptus flemingii.

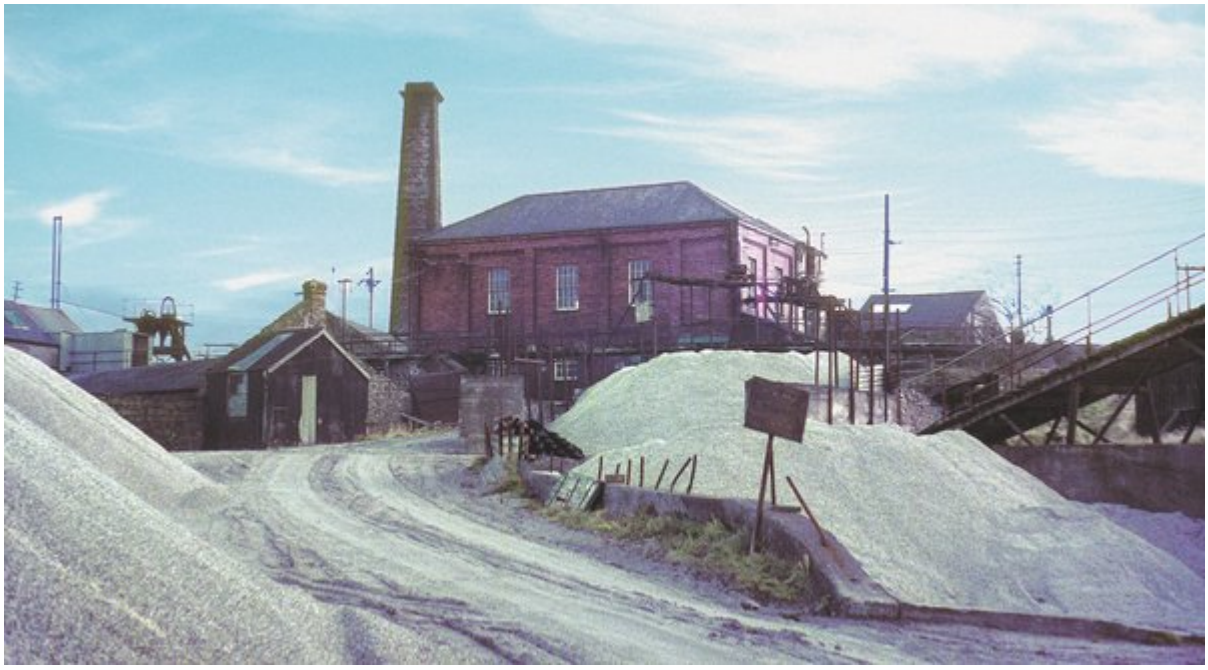


(Figure 67) A – Crinoid, Woodocrinus sp. B – Goniatite C – Brachiopod, Spirifer bisulcatus group.

(Figure 68) Extracting and crushing rock for aggregate at Barrasford Quarry; the near-horizontal bedded rocks behind the excavator are metamorphosed Oxford Limestone.



(Figure 69) Roadway in underground workings of the Little Limestone Coal at Blenkinsopp Colliery photographed in 2002 © Joel Porter.



(Figure 70) Stock piles of witherite at Settlingstones Mine in 1967.

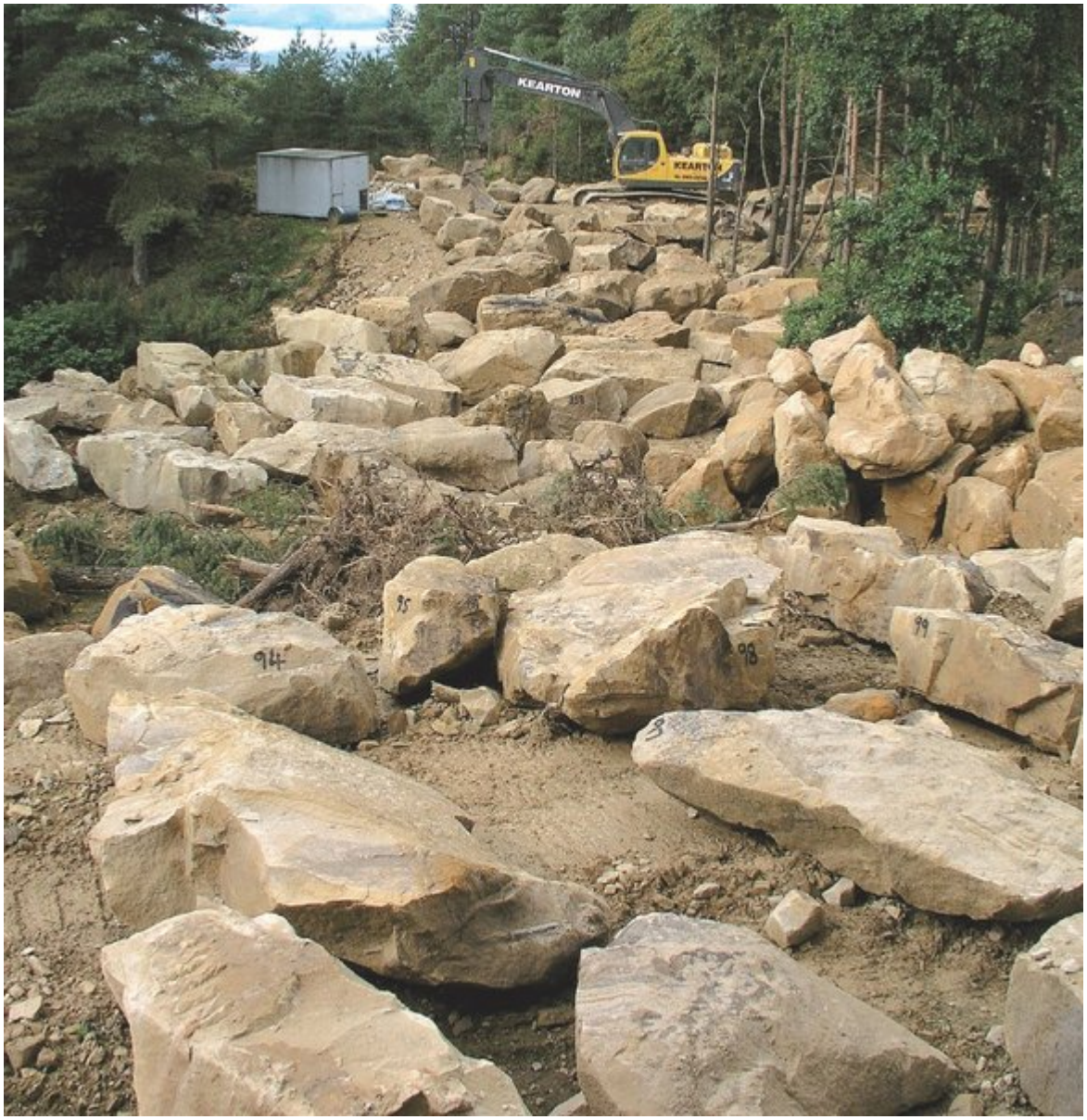
(Figure 71) Barrasford cottages.

(Figure 72) Houses built from local sandstone in Front Street, Glanton.

(Figure 73) Abandoned millstones in Prudham Sandstone Quarry.

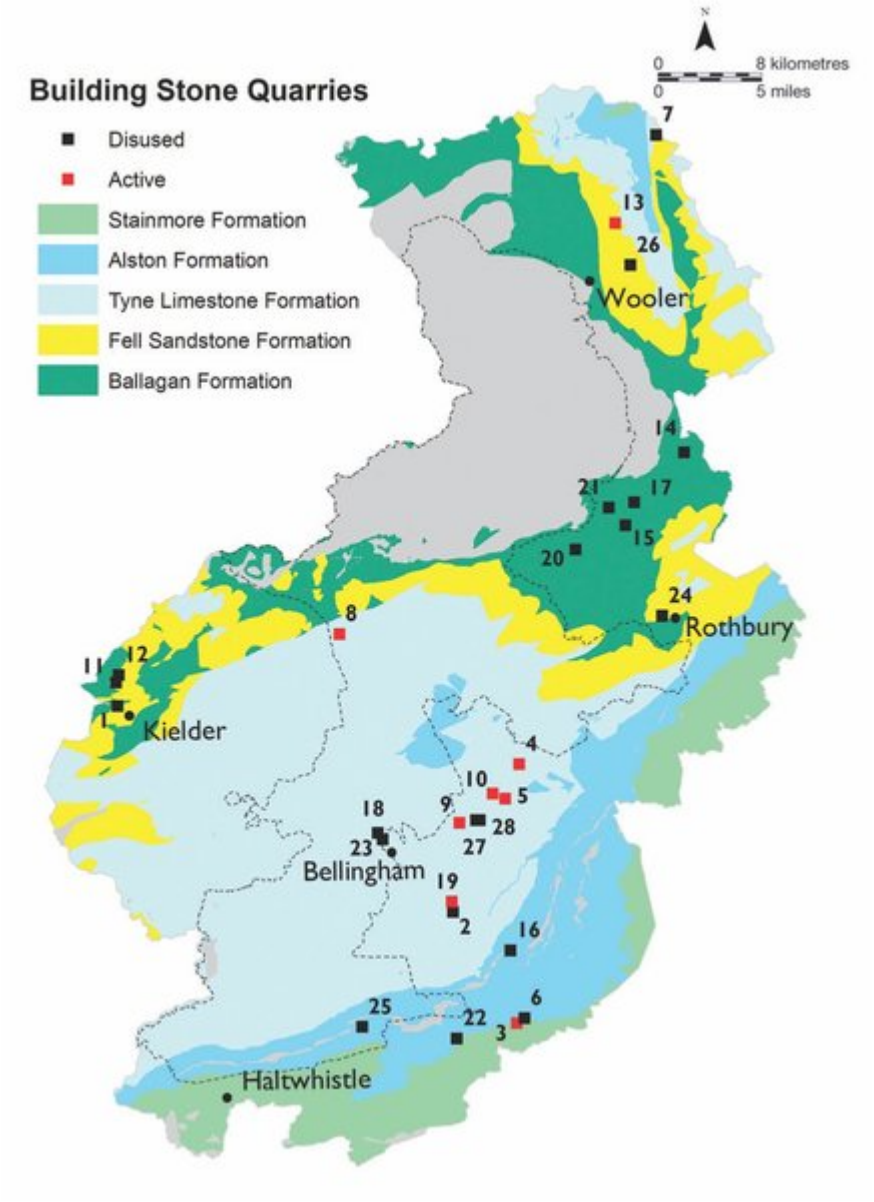
(Figure 74) Hole Bastle, near Bellingham, constructed from random rubble sandstone with roughly dressed larger blocks used for corner stones and surrounds to openings. The flagstone roof is typical of those once common in southern parts of the district.

(Figure 75) Glanton Pike Sandstone Quarry, photographed in 1928.

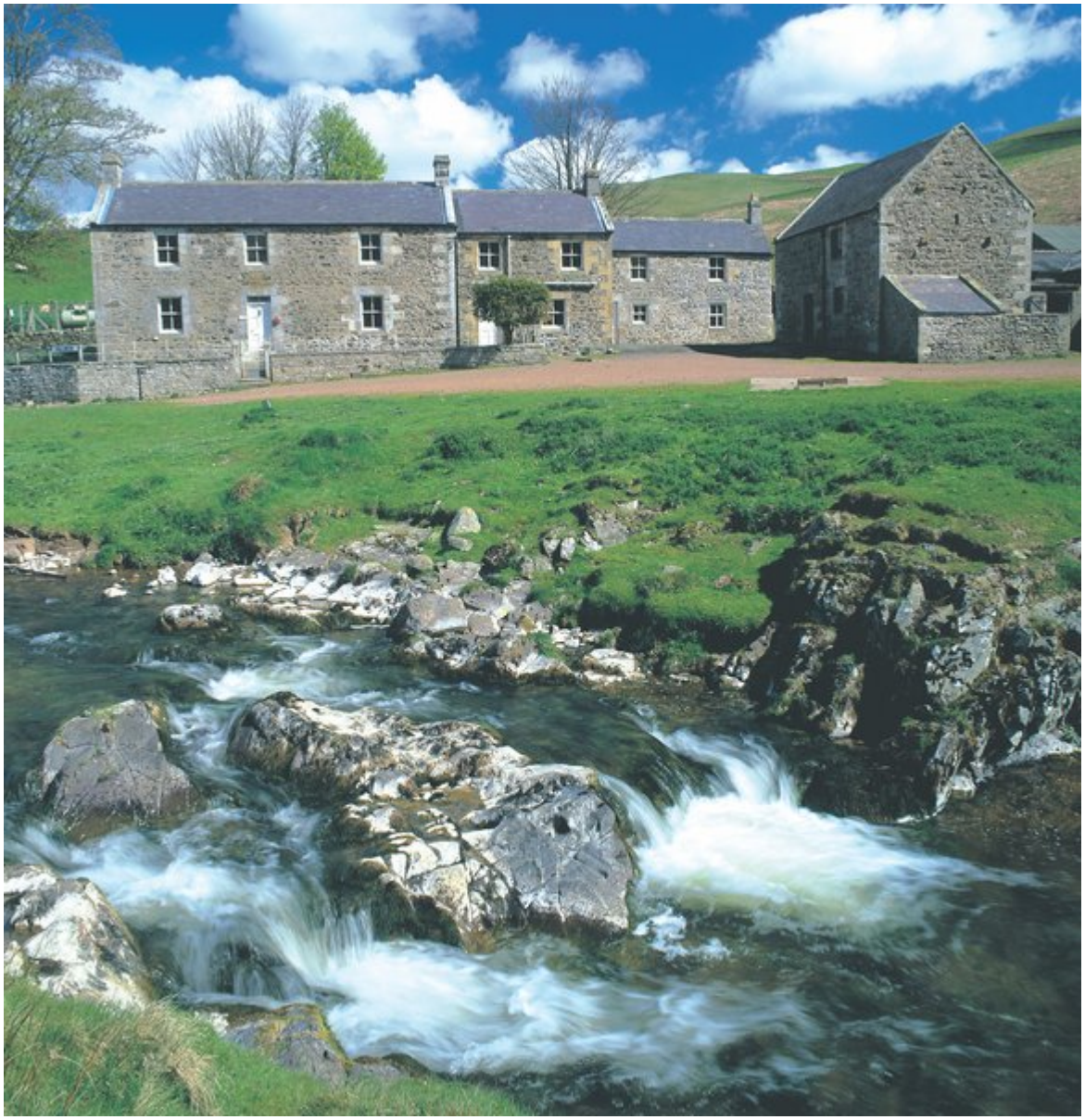


(Figure 76) Blocks of sandstone stockpiled in Millknock Quarry awaiting processing.

(Figure 77) The working face at Cop Crag Quarry near Byrness showing the highly distinctive yellow-orange colour of the sandstone. The massive thick sandstone beds are split by inserting a series of parallel vertical drill holes and black powder blasting, visible on the quarry face in front of the figure.



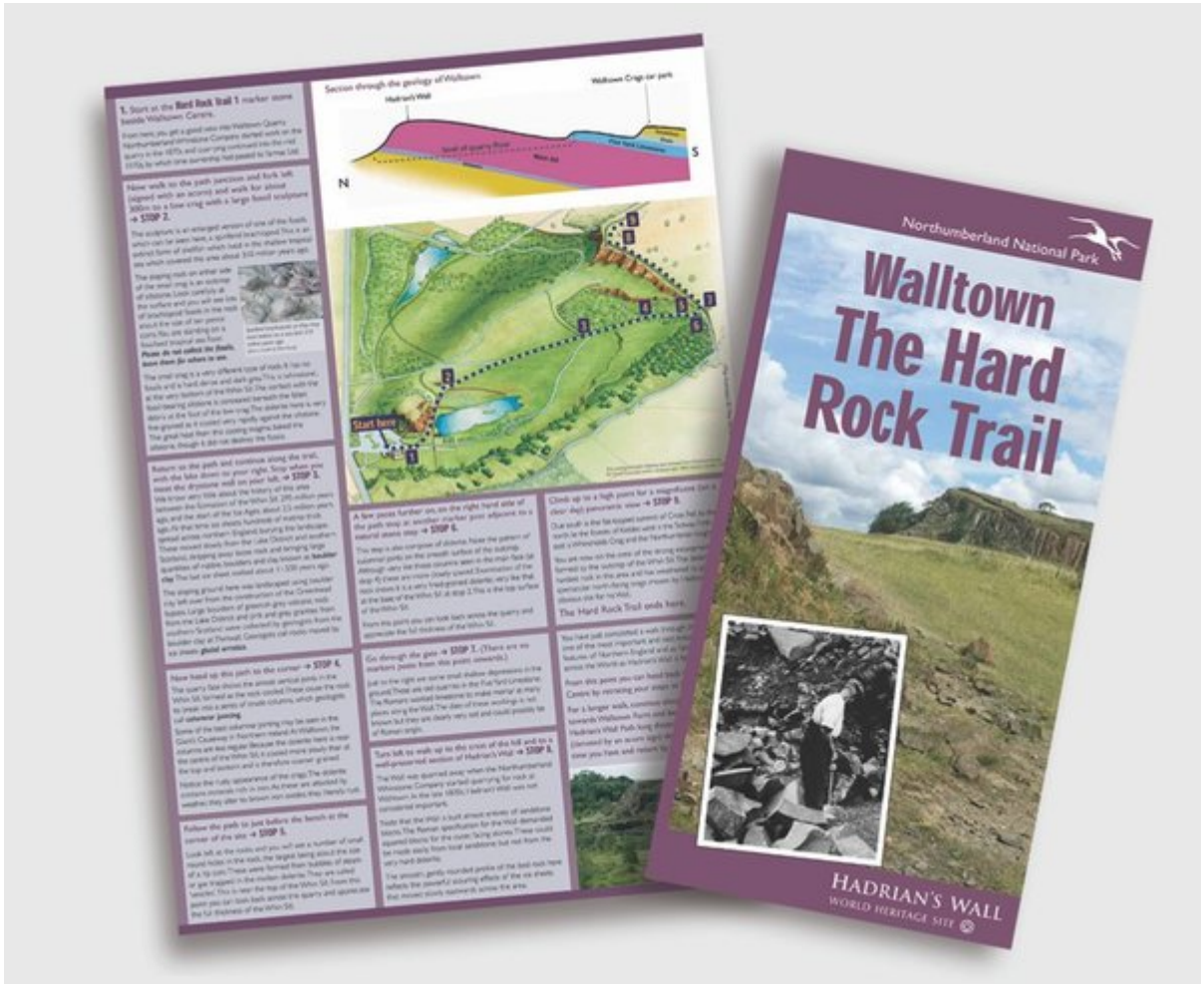
(Figure 78) Building stones quarries table.



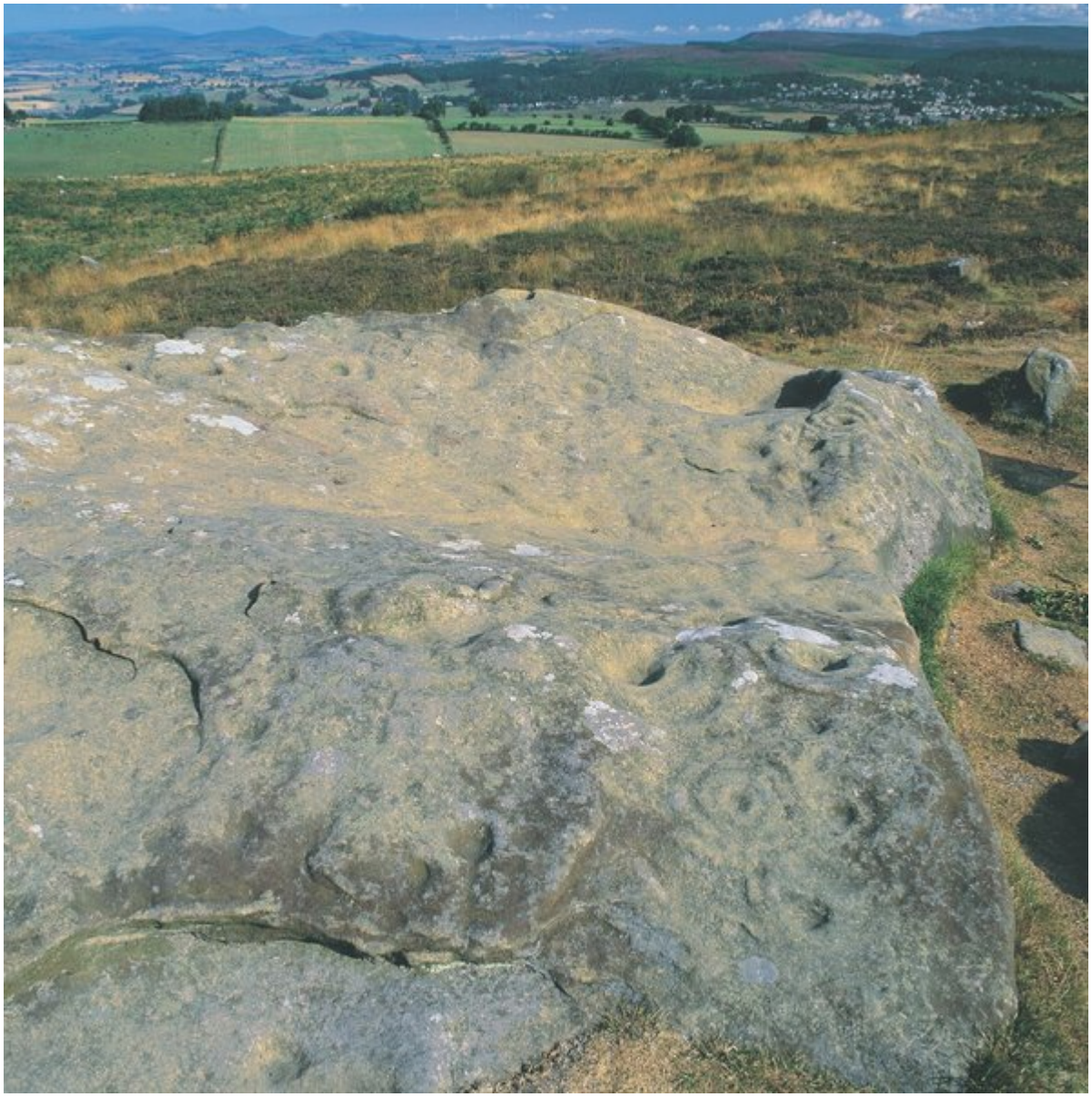
(Figure 79) Volcanic rocks exposed in the River Coquet near Shillmoor Farm © Graeme Peacock www.graeme-peacock.com.

(Figure 80) Vibrator vehicles operating in Northumberland during a seismic survey in the late 1980s. Large pads are lowered onto the road surface and a radio signal is sent which induces a vibration into the ground from each pad.

(Figure 81) Guided walk exploring the landscape above Walltown © NNPA.



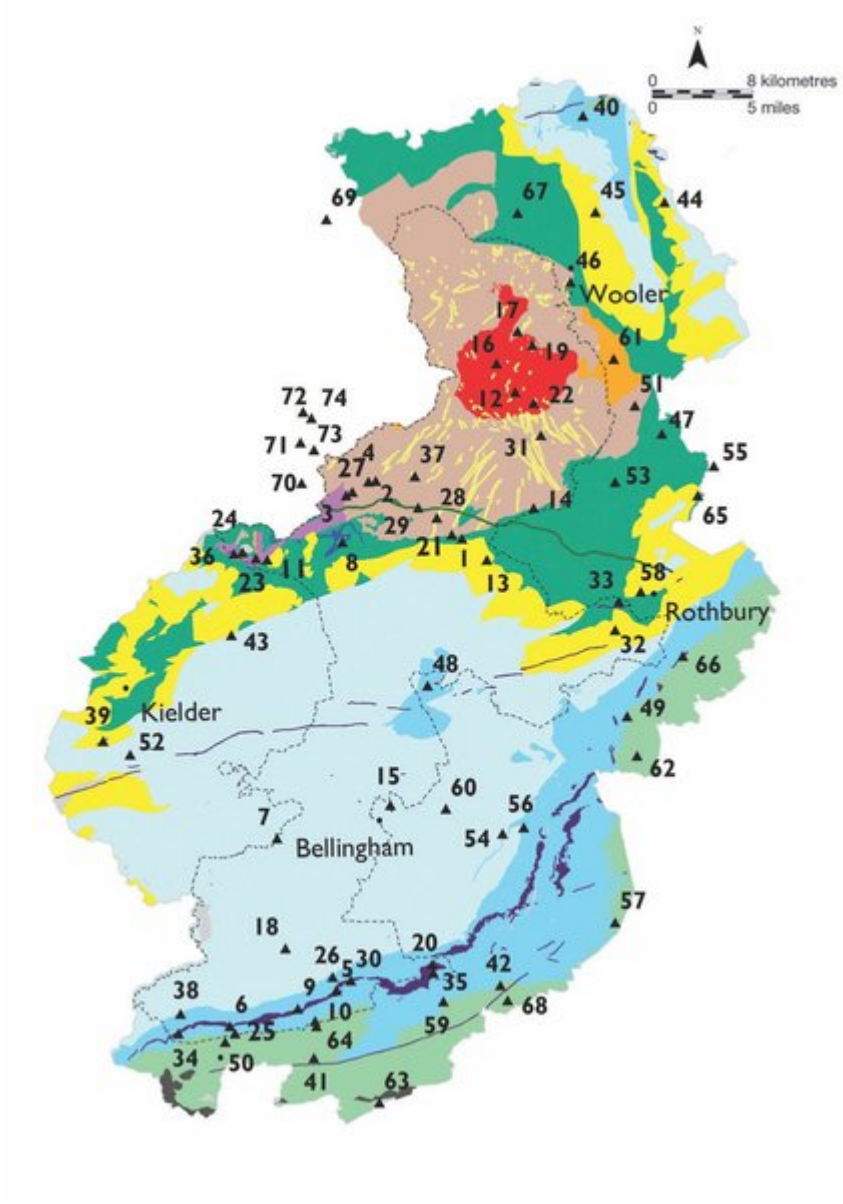
(Figure 82) Walltown. The hard rock trail booklet.



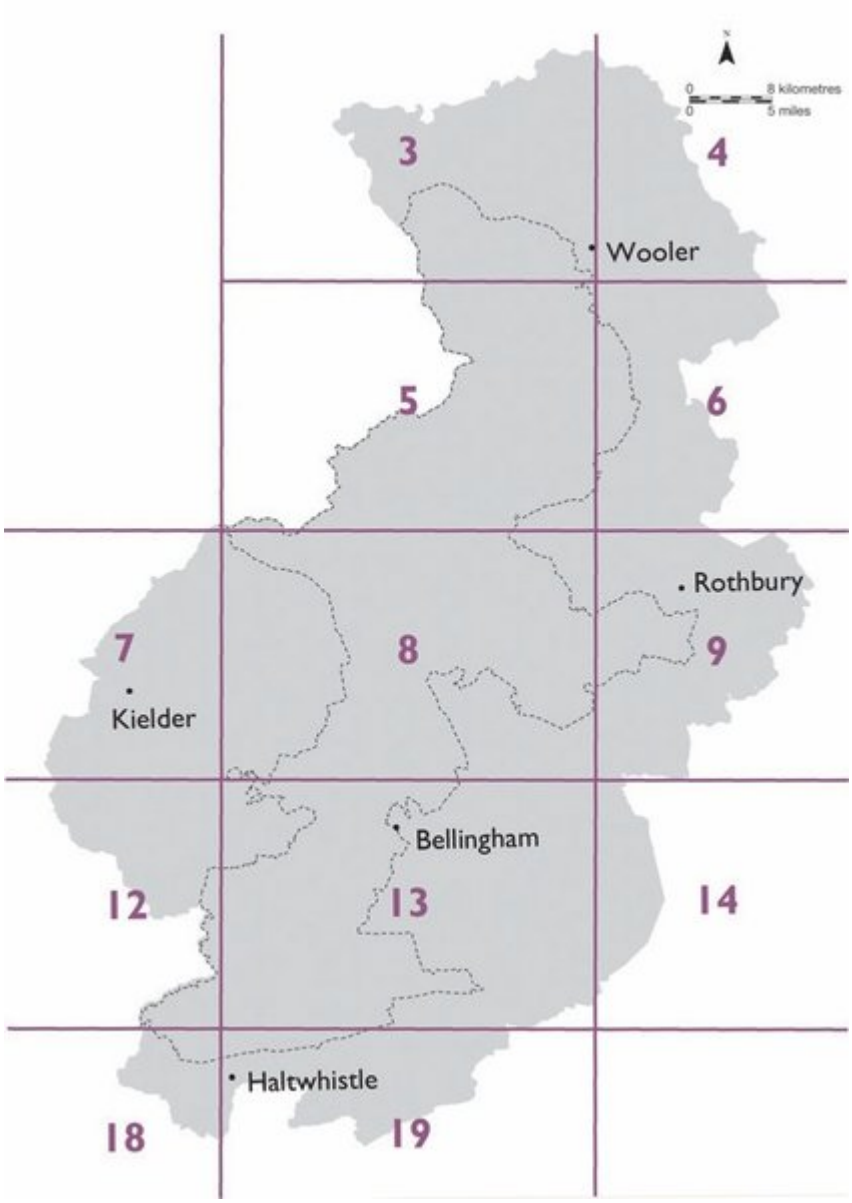
(Figure 83) The Lordenshaw rock, a panel of rock art cut into the Fell Sandstone; looking north-west towards the Cheviots © Graeme Peacock www.graeme-peacock.com.

(Figure 84) The opening into the pot at Great Tosson Limekiln.

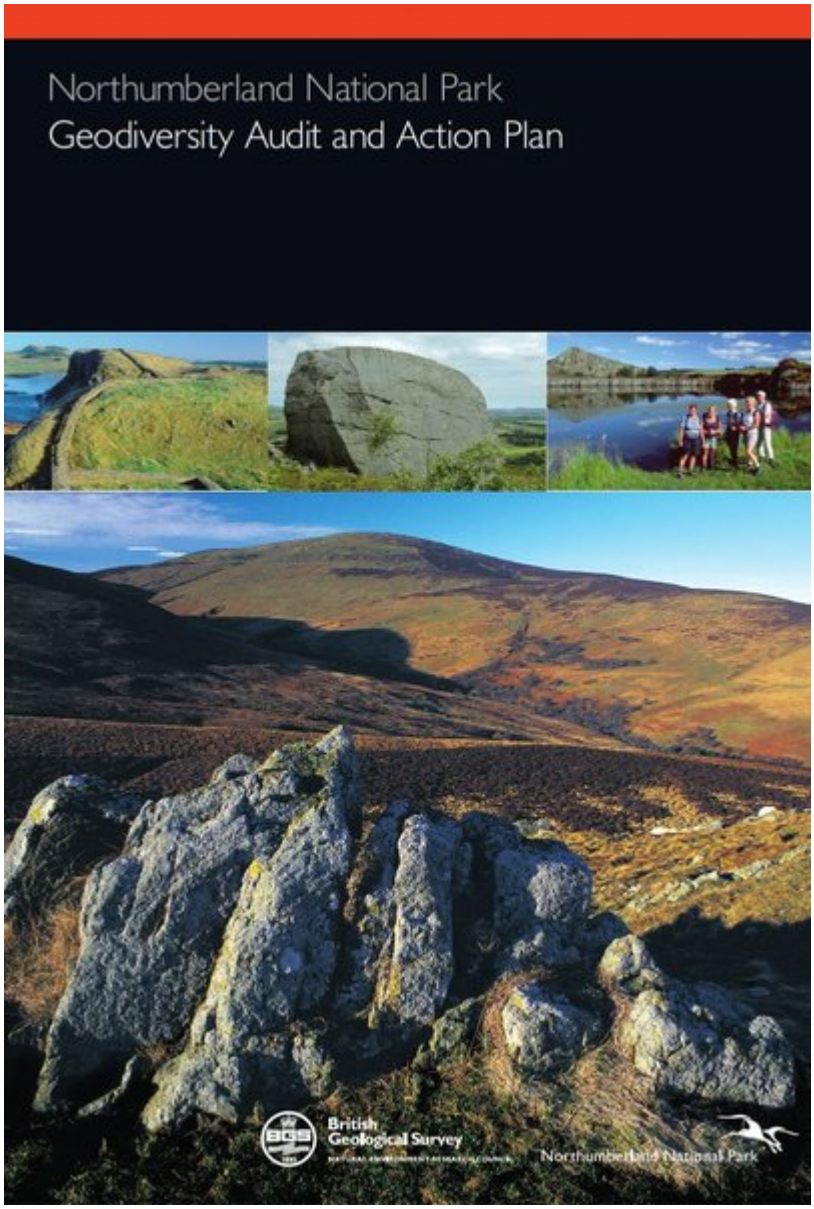
(Figure 85) Old quarry in the Whin Sill at Walltown Crags © Graeme Peacock www.graeme-peacock.com.



(Figure 86) Geodiversity sites in Northumberland National Park and the surrounding area.



(Figure 87) Coverage of BGS 1:50 000 scale geological maps and explanatory memoirs for the district.



(Front cover) Cover images clockwise from top left: Hadrian's Wall above cliffs of Whin Sill, looking west towards Crag Lough © Graeme Peacock. The Drake Stone, a huge Fell Sandstone boulder near Harbottle BGS © NERC. Caw■elds Quarry in the Whin Sill, now a recreation area © Graeme Peacock. Looking south-west from Long Crags towards the granite hills of Hedgehope and Cheviot © Graeme Peacock www.graeme-peacock.com.

(Location map) Location map for the district described in this book.