Fossils of the Yorkshire Dales

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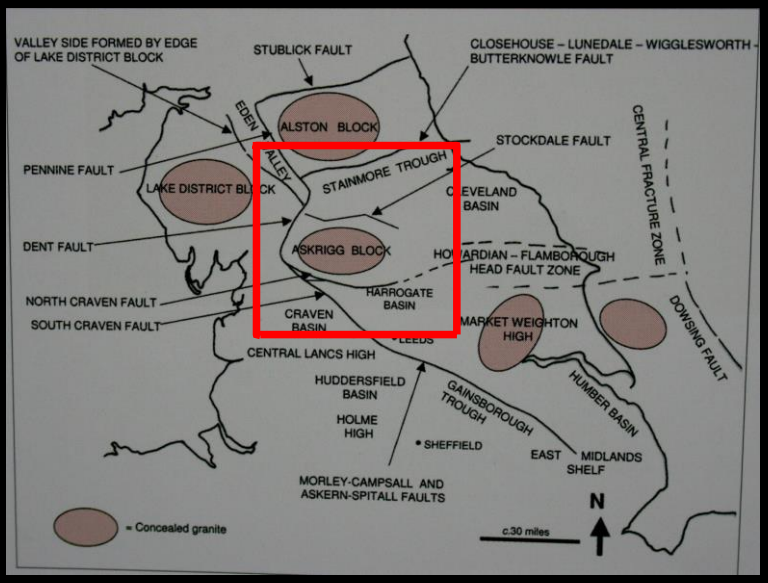
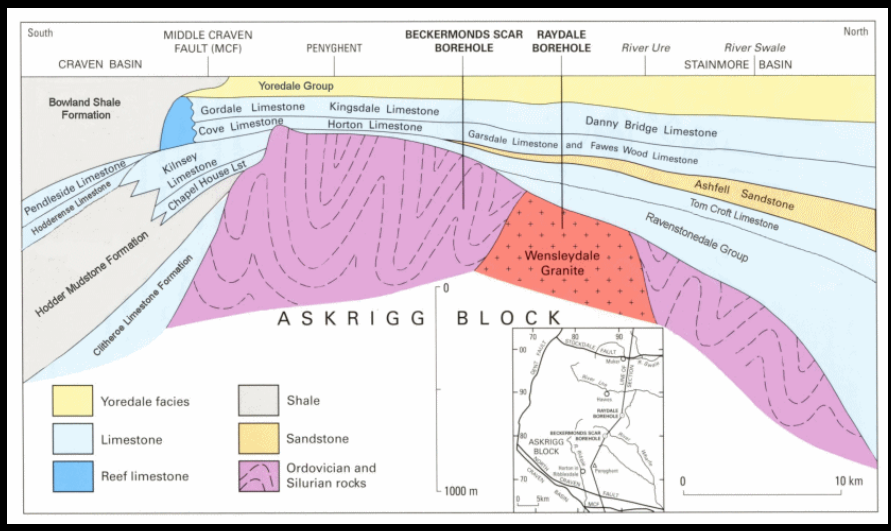
The rocks of the Yorkshire Dales

Mostly Carboniferous (359-299 Ma)

Why the Dales are there

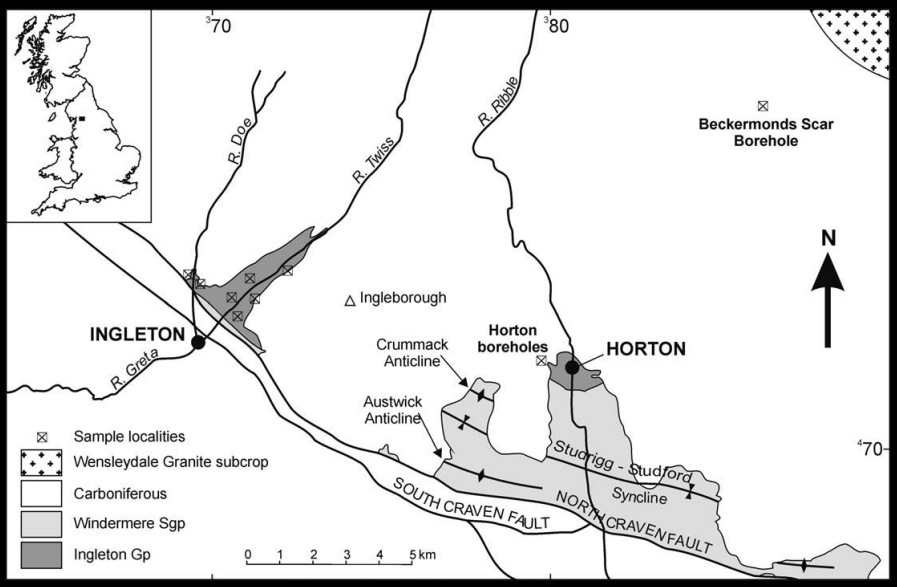


Buoyant granite



The Askrigg Block

Yorkshire's oldest rocks



Yorkshire's oldest rocks

Thornton Force:
Carboniferous rocks overlying metamorphosed Ingleton Group

The Ingleton Group

Intensely folded, deep marine, sedimentary rocks

Pecca Quarry, photograph © Ashley Dace

Not fossiliferous

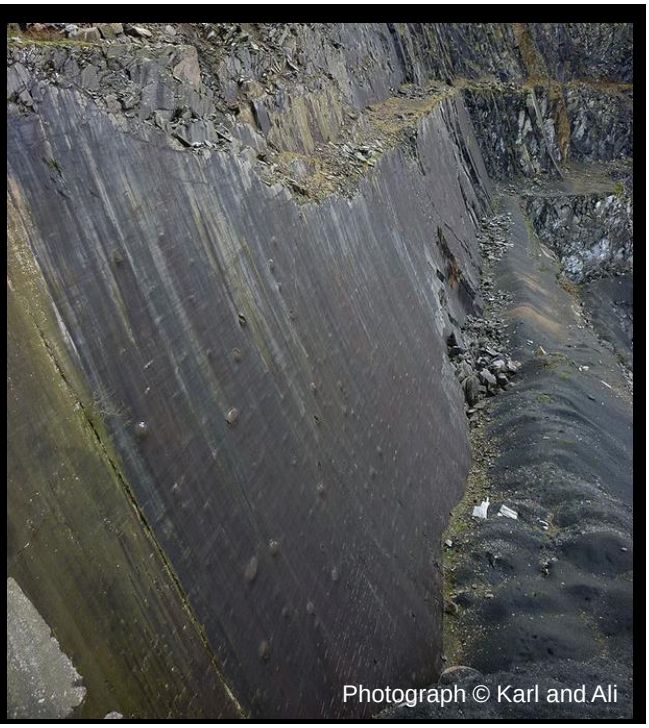
Very rare microfossils found

Pecca Quarry, photograph © Ashley Dace

Above the Ingleton, the Lakes

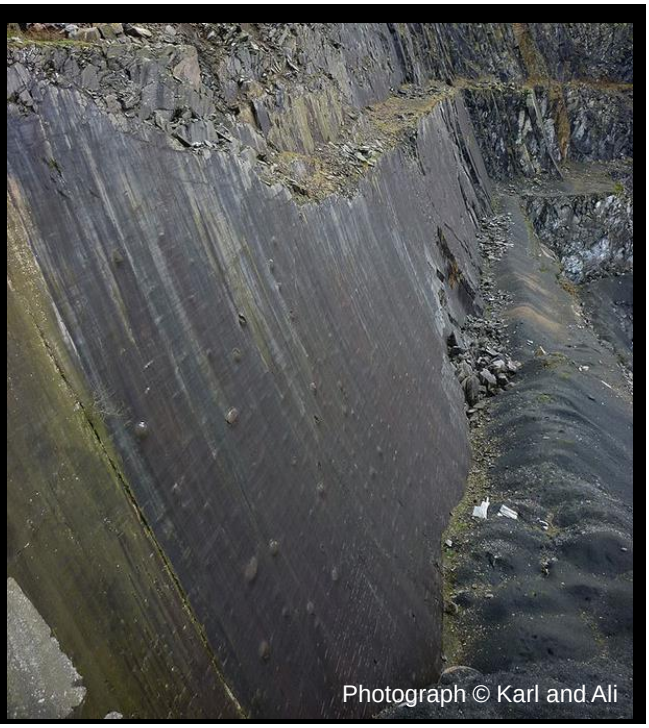
Windermere Supergroup (Ordovician-Silurian turbidites):

Horton Formation (Silurian), Dry Rigg Quarry, nr Helwith Bridge.



Also fossil-poor

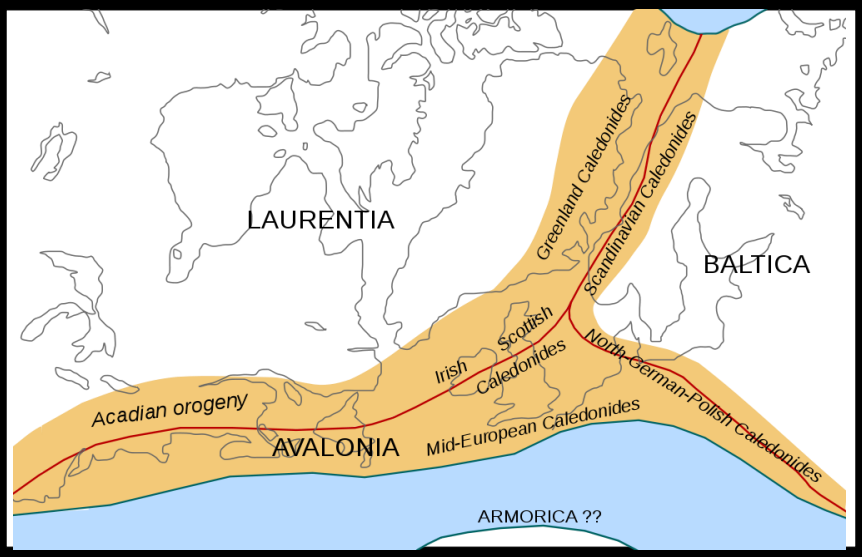
Occasional shell debris found



The Devonian is missing

Combs Quarry, Ribblesdale: Unconformity between Silurian and Carboniferous rocks

Why?



Late Caledonian-Variscan orogeny

Early Carboniferous

Basins and dales of limestones and shales

Two distinct regions:

Askrigg Block =
Limestone dales

Craven, Harrogate, Bowland =
Shale basins

Up on the blocks

Granite-buoyed high

LIMY:

3. Yoredale Group
2. Great Scar Limestone Gp
1. Ravenstonedale Group

Great Scar Limestone Group

The not-great-for-fossils group

But some patches

Reef knolls at Malham and Cracoe

Down in the basins

Tectonic lows

Craven, Harrogate and Bowland basins:

MUDDY

2. Craven Group

1. Bowland High Group

Fossil hunting (sort of)

Shale gas potential from organic-rich mudstones

Fossil hunting

Goniatites occur in mudstone bands

Yoredale Group

Basins and dales of limestones and shales

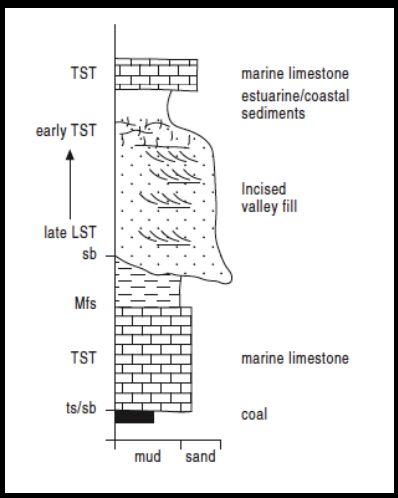
Yoredale
= Uredale
= Wensleydale

Phillips (1836)
recognized rocks
in repeated sets

Yoredale Cycles

Cyclic changes in sediment types

1. Limestone
- - - - - - - - - -
4. Mudstone / coal
3. Sandstone
2. Shales
1. Limestone
- - - - - - - -
4. Mudstone / coal



From Tucker et al. (2009)

Fossil Cycles

Fossils change with sediment types

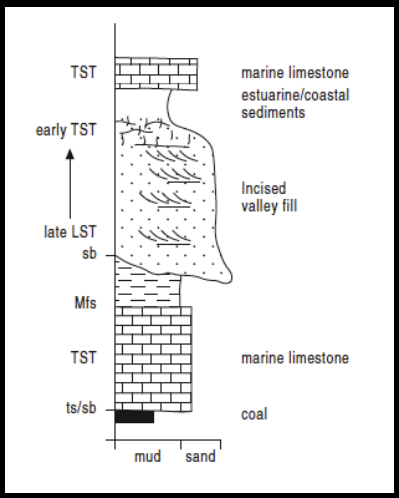
1. Reef animals

- - - - - - - - - -

4. Plants
3. Trace fossils
2. Goniatites
1. Reef animals

- - - - - - - -

4. Plants



From Tucker et al. (2009)

Limestone fossils

Coral colonies

Limestone fossils

Crinoids

Limestone fossils

Big brachiopods

Limestone fossils

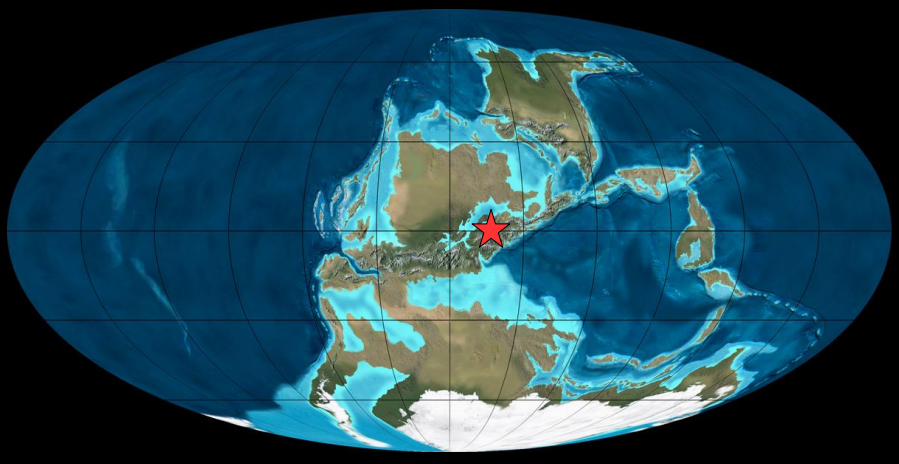
Sharks of Leyburn!

Numerous teeth and spines found by Wm Horne

Sphenacanthus reconstructed

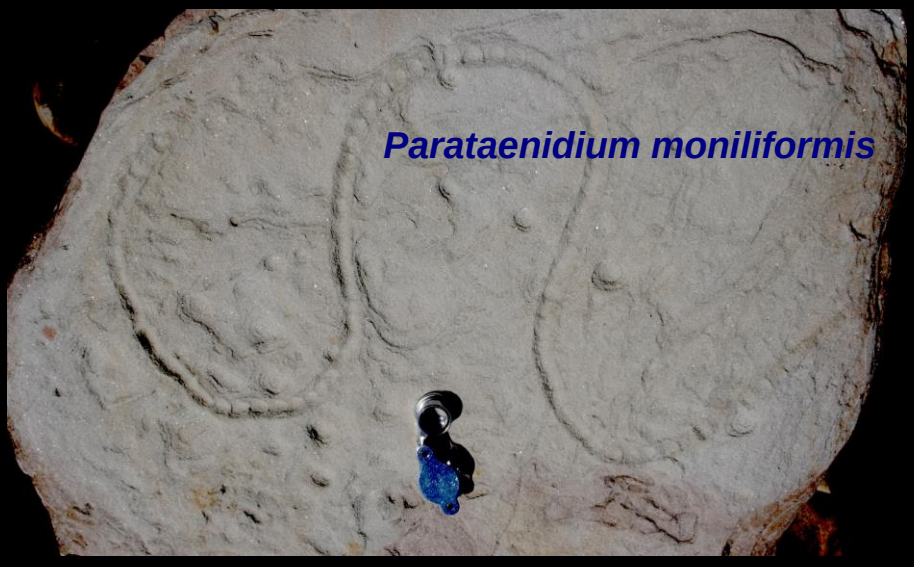
Equatorial Yorkshire

Climate and sea-level change in a glaciated world

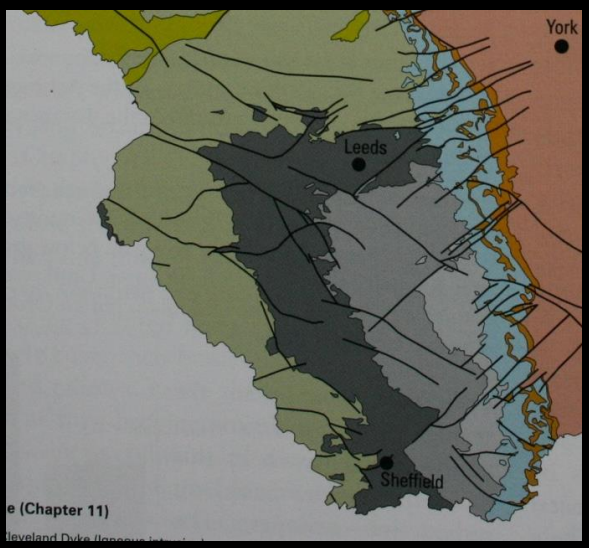


Carboniferous palaeogeography, © Chris Scotese

Sandstones + siltstones
Trace fossils



Late Carboniferous
Sandstones and coal



3. Pennine Coal Measures Group
2. Millstone Grit Group
1. Yoredale / Craven groups

Millstone Grit

Fluvial sandstones, Brimham Rocks

Millstone Grit

No fossils (again!)

High energy, abrasive rivers = low preservation

Pennine Coal Measures Fm

Truly 'Carboniferous'

A few small outcrops around Dales

Common Carboniferous plants

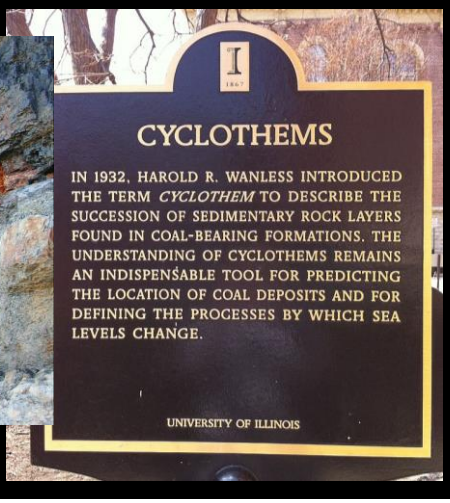
Lepidodendron
Giant club moss

Calamites - horsetail

Cycles again

Mostly fluvial, deltaic or swampy

But 13 marine incursions recorded in Yorkshire



Links

See my website, FossilHub:
www.fossilhub.org

Dales fossils on the coast

***Lithostrotion*,**
Early Carboniferous coral,
Yorkshire coast erratic.