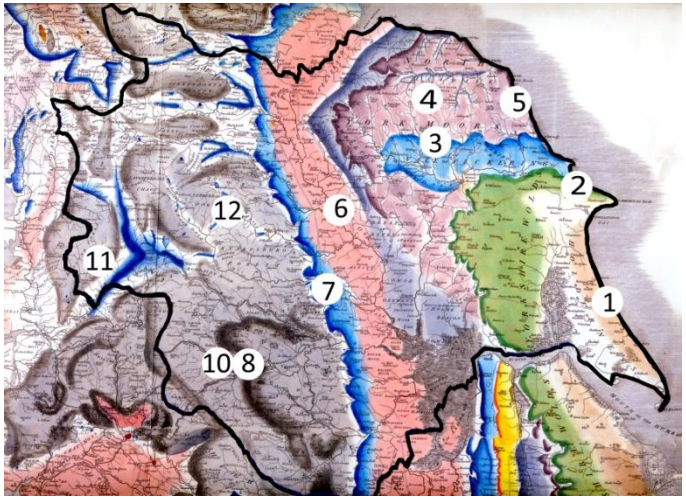


A section of Smith's 1815 map, with Yorkshire outlined. The numbers show where we obtained the rock samples detailed in the table overleaf.

Identifying Smith's Rocks

The names Smith gave to the rocks have been changed many times, and each stratum has been subdivided into ever greater detail and complexity. This made it difficult to identify suitable rocks. A particular challenge was Smith's 'Clunch Clay' - in other parts of the country, this is clearly Oxford Clay, but in Yorkshire, the Oxford Clay does not correspond to the Clunch Clay shown on the 1815 map. We finally concluded from modern maps that we needed a sample from the lower Lias Group, and found our sample at Boggle Hole, where the cliffs expose this stratum lying underneath the 'Iron Sand and Carstone'.

Obtaining the samples

Some of the strata are buried under top soil or many metres of superficial deposits. Most of our sources required permission/donations from landowners and quarry owners. Other samples, like the Chalk, Holderness Clay and Clunch Clay were picked up from various beaches. Only one sample, the coal, had to be sourced outside Yorkshire– it was obtained from an open cast pit in Northumbria, but is from the same formation as Yorkshire coal.

(over)

Preserving the samples

Some samples, such as the Millstone Grit, are very durable, but the chalk, coal and clays weather quickly. Two of the clays have been fired into attractive ceramics, while Clunch Clay has a protective cloche. The coal has been painted with yacht varnish, and the chalk with a commercial stone preserver.

Further Reading

For children and non-technical adults:

Bell, Richard: *Yorkshire rock: a journey through time.* Nottingham: British Geological Survey, 1996

Equally accessible:

Osborne, Roger: *Rocks and landscape of the North York Moors.* Helmsley: North York Moors National Park Authority, 2010

Slightly more serious, but easily readable :

Ensom, Paul: *Yorkshire geology*. Wimborne Minster: Dovecot Press, 2009

Easily accessible detailed information can be found at www.bgs.ac.uk. Of particular interest is the BGS **'Geology of Britain Viewer'** which also allows you to flip between the WS 1815 map and a modern geological map www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html

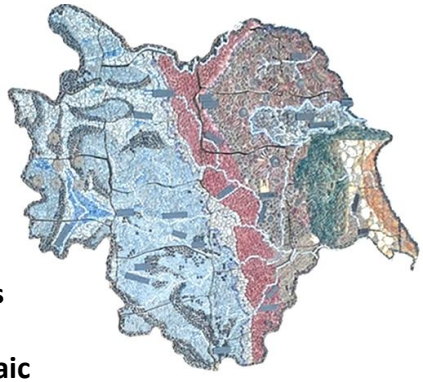
Liam Herringshaw's website fossilhub.org contains a wealth of eclectic information, mostly based on lectures he has given. Look for York_Rocky_History_SML

The **YPS website** www.ypsyork.org gives the background to the walk-on Geological Map Project, and short biographies of William Smith and John Phillips. (Enter **Geological Map Page**s in the search box)

Issue 12/07/16

The Walk-on Geological Map

a guide to the rocks it represents



Yorkshire in pebbles

The Mosaic

The walk-on mosaic map in Museum Gardens was commissioned jointly by the Yorkshire Philosophical Society and York Museums Trust in 2015. Designed and built by artist Janette Ireland, it represents the Yorkshire part of William Smith's famous geological map of 1815, the first of a complete country. An original copy of this map can be seen in the Yorkshire Museum. Leaflets explaining the features of the mosaic can be obtained from the Yorkshire Museum or the YPS, and can also be downloaded as pdfs from the YPS website.

The Rock Samples

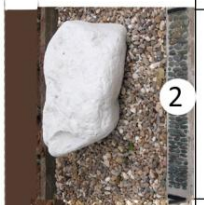
The pebbles in the mosaic reflect the colours Smith used in his map, but genuine Yorkshire rocks are displayed in the flower beds on either side of the mosaic. The table overleaf gives information about these samples, including the names Smith gave them, and their modern names.

Smith showed 23 different strata in his complete map, but only 9 were present in Yorkshire - though we have represented his description '*Coal measures – Paving and Millstones*' by 4 separate samples

Detail of Rock Samples

TO ORIENTATE THIS GUIDE, YOU MAY FIND IT HELPFUL TO STAND NEXT TO THE PAVILION, WITH YOUR BACK TO IT, AND ST.OLAVE'S CHURCH IN FRONT OF YOU

START (Youngest rocks) — **FINISH (Oldest rocks)**

Our sample		*Smith's name* (Modern name)		AGE (m. yrs)		*Smith's name* (Modern name)	Our sample	
				0		(Note - Yorkshire has a few even older rocks, not identified by Smith)		
 1	Fired and sieved Boulder Clay from Mappleton, Holderness, with the sieve residue set in resin	***Clay with some Sand and Gravel*** **(Till or Boulder Clay)**	QUATERNARY	359	CARBONIFEROUS	***Derbyshire Limestone*** **(Carboniferous Limestone & Yoredale Series)**	Carboniferous Limestone from Coldstones Quarry near Pateley Bridge	12 
	*Note: No Tertiary rocks in Yorkshire			2				
 2	Chalk from Speeton near Flamborough Head	***Chalk*** **(White Chalk)**	CRETACEOUS	65 330		(Millstone Grit Group)	Millstone Grit from West Yorkshire.	11 
 3	Corallian Limestone from Spaunton Quarry.	***Limestone of the Vale of Pickering*** **(Corallian Group)**	JURASSIC	145 320		***Coalmeasures*** ***Penant paving Grindstones and Millstones*** (Pennine Coal measures) Many alternating strata of coal and paving	*Gritstone, buff colour, from Moselden Quarry, Huddersfield*	10 
 4	Ferruginous Sandstone from North York Moors	***Iron Sand or Carstone*** **(Ravenscar Group)**		Increasing age			Coal from a surface pit at Portland Burn, Northumbria	9 
 5	Lias Group siliceous Mudstone from Boggle Hole	***Clunch Clay and Shale*** **(Lias Group)**					Sandstone, grey colour, from Appleton Quarry, Huddersfield	8 
 6	Fired Triassic red clay from Alne brickworks Red Marl is indicated by reddish strip (clear glaze) in the middle	***Red Marl*** **(Triassic Mudstone, Siltstone & Sandstone)**	TRIASSIC	200 299	PERMIAN	***Magnesian Limestone*** **(Magnesian Limestone Zechstein Group)**	Magnesian Limestone recovered from York building	7 
				Increasing age				

THIS GUIDE FOLLOWS THE ANTI-CLOCKWISE ARRANGEMENT OF THE TIME LINE AROUND THE MAP – SO STARTS AT THE TOP LEFT, AND FINISHES AT TOP RIGHT

PAVILION END