

Cockermouth U3A Geology Group

Sale Fell trip, 21 September 2026. Briefing note by Phil Davies.

Rendezvous, route, equipment, etc

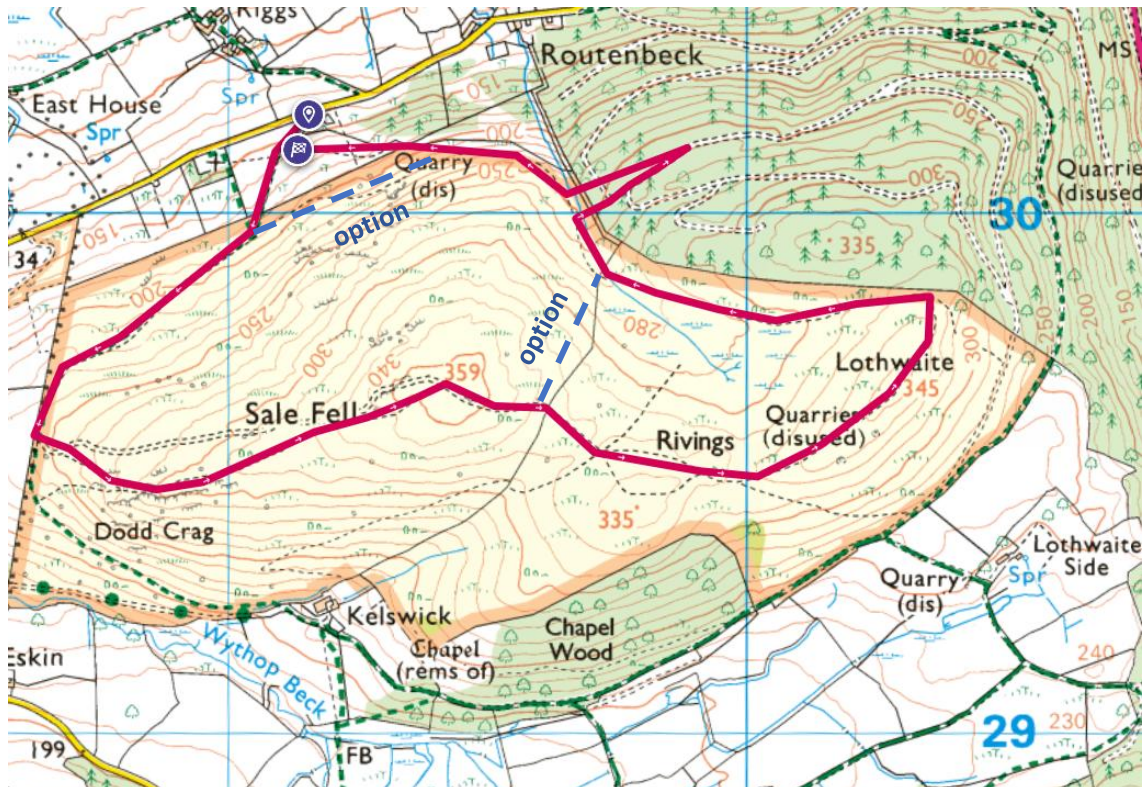
Meet at 1000h at the gateway on the Wythop Mill to Pheasant Inn Road, about 200m NE of the church. See map below. Roadside parking is usually available, but car sharing is advisable. **NY 192 302.**

We are going to traverse Sale Fell anticlockwise as shown on the map and examine a range of geological features en route.

Our route takes us over the summit. At the top and depending on weather we can decide whether to continue onward to take in the magnificent view over Bassenthwaite (from Lothwaite, as shown on the map) or, having covered quite a few features of the geological interest, drop down to Routen Beck to do a shorter circuit. After visiting the top of the fell we may do a side trip into the top of the Peil Wyke forestry area to examine an exposure of folded strata or opt to detour to a small disused quarry as we descend W towards the start point.

Equipment: stout walking boots, weather gear. Warning: it tends to be wet underfoot crossing into the Peil Wyke forestry area (if we do that option). Bring a light lunch / snack / drink (this isn't a long outing).

Safety: usual Lakeland fell care needed (weather, trips and falls). Care needed examining exposures at Dodd Crag. Some steep / irregular slopes and steep drops. If in doubt, skip close examination of the rocks here.



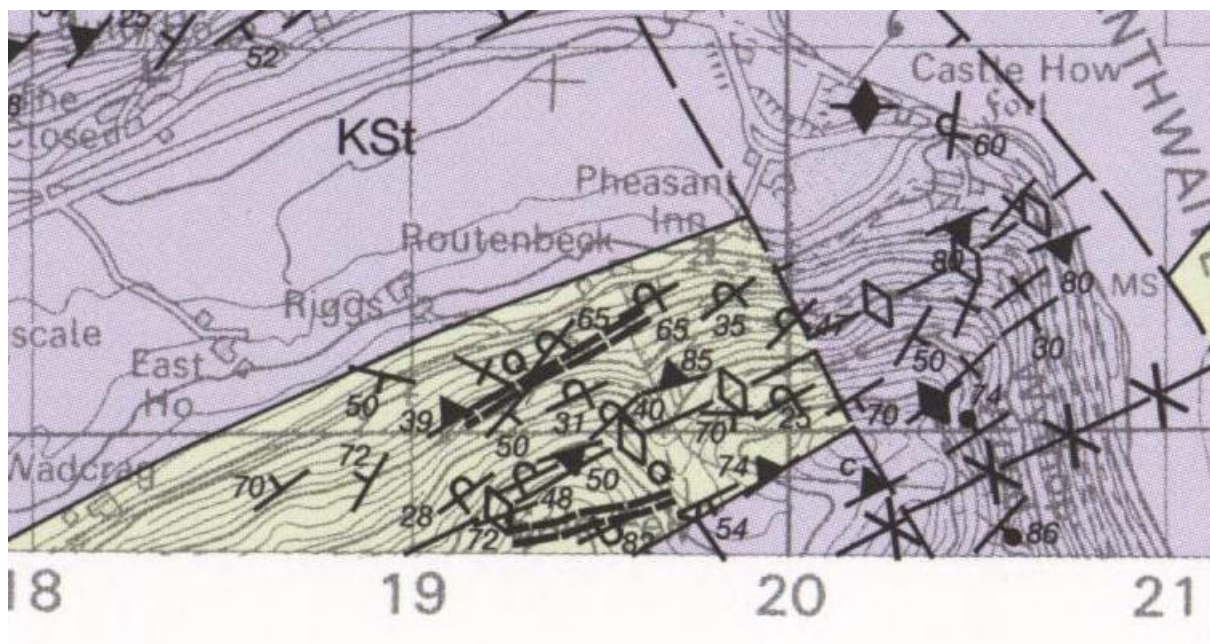
Introduction to the geology

We are in Ordovician age sedimentary rocks of the Skiddaw Group.

BGS mapping has the upper part of the Sale Fell in Loweswater Formation greywacke sandstone turbidites (pale green on the map below).

The flanks of the fell contain the overlying Kirkstile Formation, which includes sandstone as well as mudstone and siltstone (mauve on the map below, KSt).

The disposition of these large units is attributed to the presence of a major fold structure – a tight anticline. The Loweswater Formation is exposed in the central part of the fold. The jumble of symbols reflects the complexity of the geology in detail.



ORDOVICIAN	ARENIG	KSt	KIRK STILE FORMATION (KSt) Dark grey weakly parallel-laminated mudstones, silty mudstones and siltstones with fine- to medium- grained sandstone laminae	SKIDDAW GROUP
		LWF	LOWESWATER FORMATION (LWF) Fine- to coarse-grained sandstone turbidites, parallel to wavy- laminated mudstones, silty mudstones and siltstones	
		HBe	HOPE BECK FORMATION (HBe) Laminated dark grey siltstones, silty mudstones with beds of arenaceous sandstone	

Parts of BGS 1:50,000 solid geology map, Cockermouth sheet, resized

It would be necessary to piece together quite a large amount of mapping information to confirm the anticline interpretation – we will only be able to view a selection of features.

There is still uncertainty whether the Sale Fell structure is a very big slump fold, perhaps linked to the recumbent Loweswater Anticline fold interpreted at Darling Fell / Low Fell, or a crustal tectonic fold from the Acadian event. Much of the folding in this part of the Lake District has no relationship to Acadian cleavage, and is attributed to slumping. However it is likely that Acadian folding is also present. In the memoir, BGS has come down on the side of

identifying the main Sale Fell anticline as an Acadian feature. I believe there is also earlier slump folding on the limbs of the overall fold – we might spot some around Dodd Crag.

We will examine at least one intrusion – the Sale Fell Minette. This is classed as a lamprophyre – a rock with mafic phenocrysts. Biotite has been altered to chlorite in this case.

Massive quartz veining is present along the ridge – some exposures on our route, but boulders and more exposures round and about if one follows the alternative route to the summit that runs slightly to the north.

Three are interesting slump-related and tectonic structures to be examined, and we can discuss what we think is going on.

Additional information / optional background reading

The Cumberland Geologist No 2. Proceedings of the Cumberland Geological Society, 2020-2021

- Sale Fell: Three interesting outcrops¹. Phil Davies, page 67.
- Lamprophyres: A short introduction, with three examples from Cumbria. Duncan Woodcock, page 35².

The Cumberland Geologist No 3. Proceedings of the Cumberland Geological Society, 2022 - 2023

- Skiddaw Group at Peil Wyke: interpreting a complex outcrop³. Phil Davies, page 21
- Sale Fell (Excursion report). Phil Davies, page 72

BGS publications

- Skiddaw memoir
- 1:50,000 scale solid geology map: Cockermouth sheet (Keswick sheet abuts to the south)

¹ These should have been termed 'exposures' rather than 'outcrops'.

² Includes Sale Fell minette.

³ See Footnote 1!



Steeply dipping beds, E end of Dodd Crag. Spot the fold! Soft sediment deformation or tectonic deformation, or both?



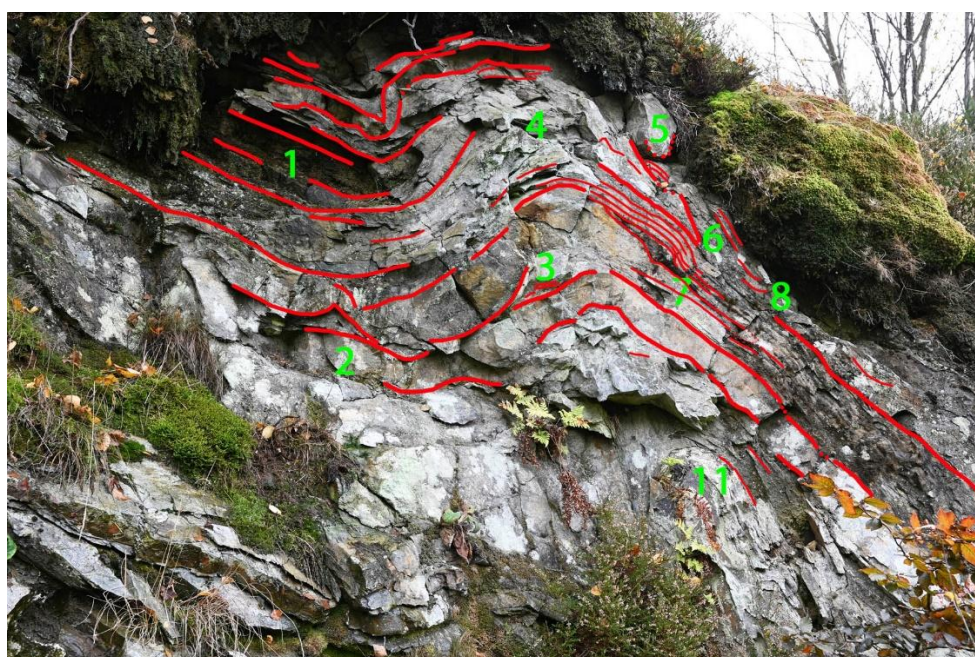
Water expulsion (handy 'way up') structures, Dodd Crag



The minette exposure near Sale summit



Folding and a possible small thrust fault (discuss!) near Sale summit



An attempt to analyse folding and other disturbance, exposure above Peil Wyke