
GEOLOGY AT ECTON

B. The Geological Setting of Ecton Hill

You may wish to download these notes if you intend to set the scene for your students.

Most of Ecton Hill, in North Staffordshire, is composed of Carboniferous Limestone of “basin facies”, i.e. the limestones are rather impure, are thinly bedded and were deposited in a localised but rapidly subsiding marine area. They contain subsidiary shales and cherts and contrast strongly with the more thickly bedded “platform limestones” which make up the rest of the limestone plateau of Derbyshire. They were more easily deformed than the platform limestones and they are folded on a spectacular scale.

Mineralisation in fissures and “pipes” in the limestone occurred later, probably soon after the rocks were folded and faulted in the Variscan orogeny. This is the only part of the South Pennine orefield where extensive copper mineralisation has taken place in a limestone host rock, in contrast to the more common lead/zinc mineralisation of the Peak District. Lead and zinc, however, do also occur in association with the copper ores at Ecton.

The wider area is a superb one for demonstrating the principle of different facies of deposition, and schools may wish to pay a brief visit to sites en route to Ecton, or on another occasion. Most of the Carboniferous Limestone of Derbyshire accumulated in very shallow water on a slowly subsiding block, or “platform”. The edges of the platform were marked by deepening water, leading down to a “basin” although this itself was probably only tens of metres deep. Along the edges of the platform, carbonate mounds occur, with steep depositional dips on the basin side. These were traditionally regarded as reefs, although it is open to question as to whether they would have presented a hazard to Carboniferous shipping, had it been invented then!

Travelling from the north:

1. Jericho Quarry, near Earl Sterndale (SK088677) – a disused roadside quarry, now landscaped somewhat and used as an HGV park. The section shows coarse, thickly bedded limestones of platform facies, including an excellent colonial coral in the middle of the face. This was inverted at the time, and is surrounded by coarser crinoid debris, indicating local turbulence.

N.B. Permission to inspect the face may need to be sought.



**Fig B1 Jericho Quarry, Earl Sterndale
(The inverted coral is in the face behind the bush)**

2. Glutton Dale (SK085672) – the road passes through the former “reef belt”, marking the edge of the limestone block. The road is narrow, and potentially hazardous, but by walking down the dale, it is just possible to make out the change in dip of the beds, from flat lying platform limestones to the north-east to steeply dipping “fore-reef” limestones further to the southwest.



Fig B2 Glutton Dale from the north east, with Parkhouse Hill beyond it

It may now be possible to use the gated road into

Dowel Dale and inspect the “fore-reef” limestones at the base of Parkhouse Hill, but any fossils should be left strictly in situ, since there is a past history of misuse of this locality and it is on private land.

3. Apes Tor and Ecton Mine – superb folding and thrusting in basin facies limestones, shales and cherts, which feature in the workshops to follow.

Travelling from the south:

1. Wetton (SK102553) – limestones formed just off the edge of the platform.
2. Wetton Mill (SK096562) – “knoll reef” limestones (carbonate mud-mounds) with caves on the hillside above the mill.
3. Apes Tor – as above.

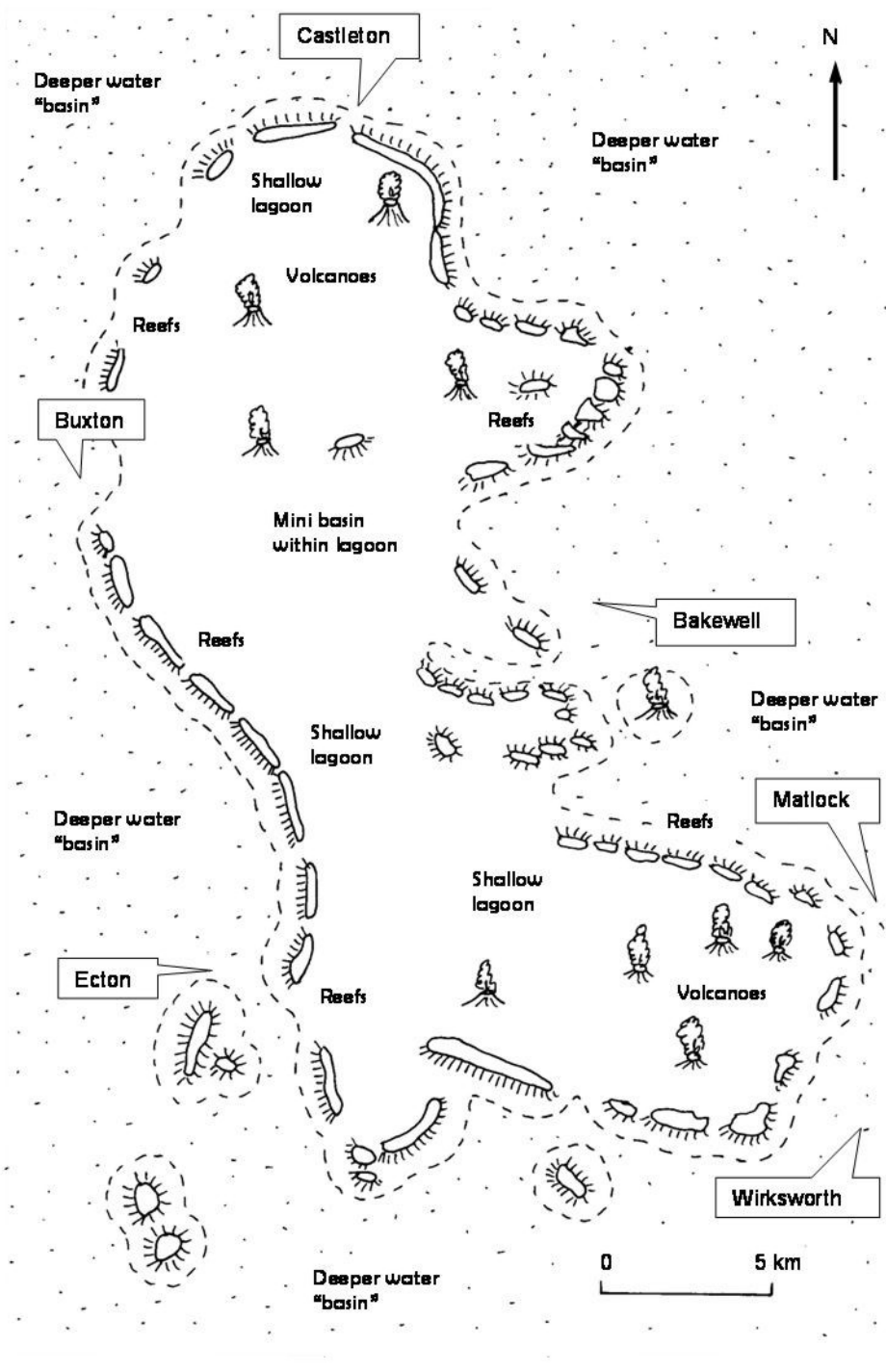


Fig B3 A “cartoon” of the Peak District in Carboniferous Limestone times. This depicts the area as a stable block covered in shallow sea water (“lagoon”, shown in plain white) with reefs (shown with hachures) around the edges. Surrounding the block is an area of deeper water “basins”, stippled). Note that the reefs are diachronous, i.e. they did not all occur at the same time. (Based on a diagram in Limestones and Caves of the Peak District by T.D. Ford)