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## Walk 1: Buck Hill, Out Woods and Beacon Hill

Precambrian deep sea sediments

**Ascent:** about 100 m

**Distance:** 5.5 km (max.)

**Difficulty:** fairly easy on good path

**Start:** grid reference [SK 5114 1634]

This walk crosses some of the oldest surviving areas of ancient woodland in Charnwood Forest and introduces you to sedimentary rocks that originally formed the floor of a Precambrian sea. The walk can be done in two stages, by parking at The Out Woods and then at Beacon Hill, or it can be merged into one longer, circular walk taking in Beacon Hill.

For the Out Woods loop of this walk, park on the wide roadside verge about 100m north of Charnwood Hall and enter the wood through the wall on the east side of the main road, just to the south of the boundary with Jubilee Wood. Here, an interpretation board gives details of the history, geology and wildlife of the woodland. The footpath curves gently northwards before climbing up the slope around the northern margin of the Out Woods. From here you can see Loughborough and the Soar valley, and a little to the south the hilly area formed by the Ordovician rocks of Buddon Wood, overlooking Mountsorrel. Follow the footpath round to the base of the large, east-facing crag (1) [SK 51393 16644]. The face is well jointed and on the right-hand side there is a prominent, sloping parting. This is a bedding plane, a junction between two sedimentary layers, or beds, which would originally have been horizontal.

The two important features of these rocks are their 'gritty' appearance — in other words, they are coarse-grained, and secondly their content of numerous small fragments of a dark, very fine-grained sedimentary rock called mudstone. you are looking at the Outwoods Breccia Member, which is a sedimentary breccia — that is, it contains many angular sedimentary rock fragments. It was probably formed by submarine landsliding (see Walk 5: Sliding Stone Slump Breccia). Options now are to walk through the wood and see more breccia exposures (2) [SK 51309 16631], or to circle farther southwards and exit the wood close to Charnwood Hall.

For Buck Hill, enter the footpath skirting the northern perimeter of Charnwood Hall (3) [SK 51092 16187]. The wooded rocky knoll to the right typifies the scenery of Charnwood Forest, where hard Precambrian rocks project through a covering of Triassic Mercia Mudstone. The latter rocks, being soft and easily eroded, form the lower ground. They are, however, hidden by a bouldery, scree-like layer of Quaternary age, called 'head'. This formed some 12000 to 30000 years ago in the intensely cold (periglacial) climatic belt just beyond the margin of a continental ice sheet. If you look across the field, and just to the right (east) of the wall around the knoll, you will see some prominent Precambrian bedding planes. They slope eastwards, indicating that you are on the eastern flank of a structure known as an anticline — this is an up-folding of the Charnian rocks, and is illustrated in the cross-section on the map. When the path climbs the hill (4) [SK 50959 16122], exceptionally well-bedded and laminated rocks of the Beacon Hill Formation are exposed to the left.

Sandpaper-textured sandstone layers alternate with more smooth-surfaced siltstone and mudstone.

All of these rocks have a high content of very small particles of volcanic ash and are called tuffaceous rocks; they are also rich in silica and, in consequence, they appear very hard and flint-like.

Continue over the rise and a little way down the other side turn sharp right and enter the wood by the corner of a stone wall (5) [SK 50901 16138]. Bearing left along the path, note the angular rock fragments — you are walking across a vegetated scree, another example of material formed during the Arctic climatic conditions described above. As the path slowly climbs up the side of this wooded valley, you will see many more exposures of Charnian rocks including, just

inside the edge of the wood (6) [SK 50758 16271], good examples of well-laminated beds. If you look carefully, you will see graded bedding. This was caused by the flow of sediment grains in a turbidity current. Denser sandy grains settled towards the base whereas finer material, such as silt, was concentrated at the top of the bed (normal grading).

Just beyond (6) [SK 50758 16271] you will break out on to the crest of a grassy ridge with excellent views. The exposures here have jagged, triangular shapes controlled by bedding dipping east and the Charnian cleavage cutting this bedding in an easterly direction.

As the footpath descends this ridge, some of the lower exposures to the left are in thick, coarse-grained sandstone of volcanic origin. The path falls very steeply here and care is needed. To return to the main road follow the signposted track over the stile in the wall to the right.

For the longer walk to Beacon Hill, retrace your steps to (5) [SK 50901 16138] and take the footpath leading westwards into the valley of the Wood Brook. Continue along this valley, noting that the silty alluvium of a floodplain occupies its flat floor. The path then ascends the valley side to the south, crossing Dean's Lane and entering the Beacon Hill nature reserve by the North Gate (7) [SK 50461 15263]. Follow the path climbing steadily through the wood, and after a few minutes pass through a gate in a stone wall. About a hundred metres farther on, cross over a wide path and keep straight ahead, through open heathland to a series of crags. The crags on the right (8) [SK 50820 14874] are in pale grey, very hard ('flinty') tuffs; some beds up to 3m thick appear featureless ('massive'), but others show fine-scale internal lamination — can you see evidence for disrupted or 'wavy' laminae?

Scramble up the crag via the path and keep heading on upwards to the crags just below Beacon Hill summit. you will emerge through a gate onto a metalled track, where there is an interpretation board giving more details about the local geology, and the 'Old Man of the Beacon'. Take the metalled track southwards (to the right), past more superb exposures of flinty, laminated to massive tuffs. Near the southern end of the crags (9) [SK 50988 14794] can you see large 'sags' in the bedding?

These were caused by the downward penetration ('loading') of one bed into another when the sediments were still soft and wet on the Precambrian sea floor. The tuffs are widely exposed around the summit of the hill, where there is a brass plate pointing out many local landmarks. It is possible to do other walks around Beacon Hill from here.

## Figures

(Figure 92) Walk 1: Buck Hill, Out Woods and Beacon Hill. Map

(Figure 27) Crag exposing the Outwoods Breccia.

(Figure 28) Mudstone fragments in the Outwoods Breccia.

(Figure 29) Rocks at locality 4.

(Figure 30) Microscopic particle of volcanic ash from Buck Hill rock.

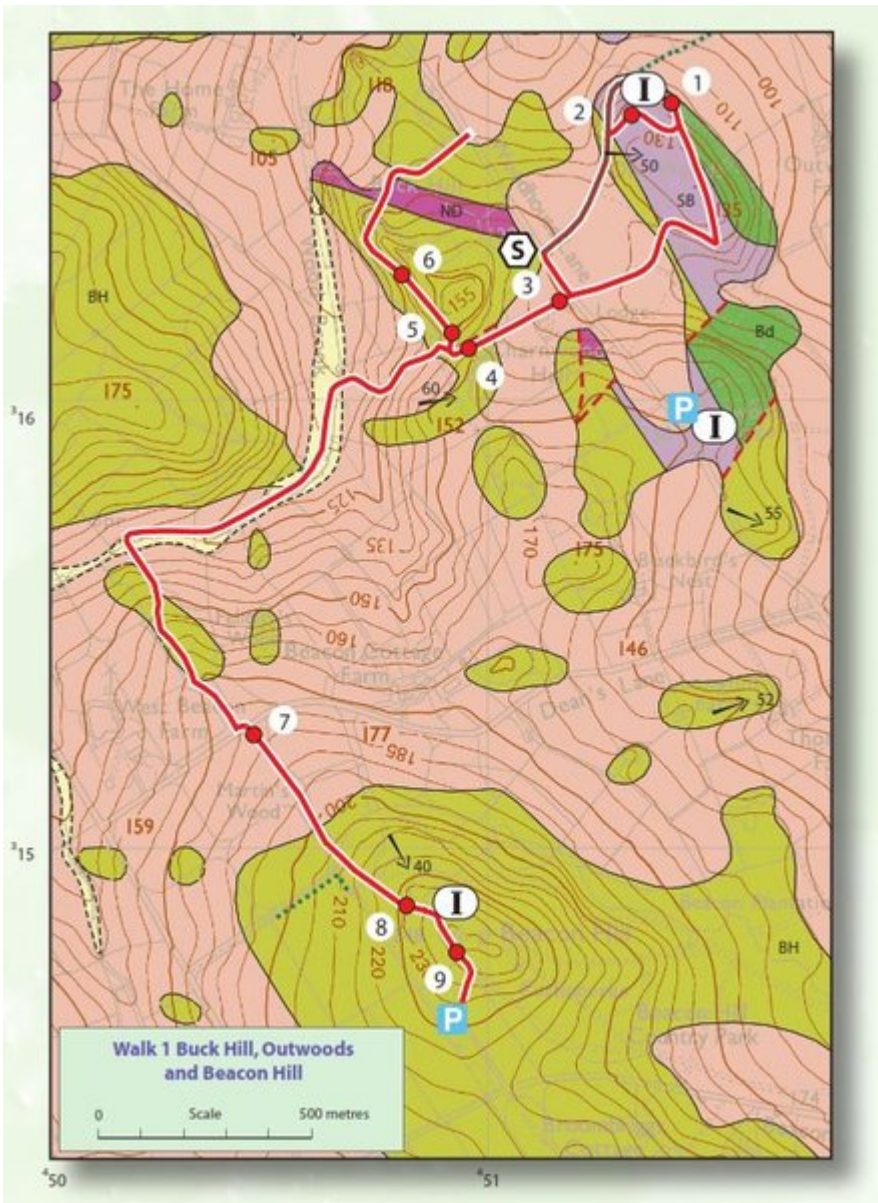
(Figure 31) Jagged exposure caused by intersecting bedding and cleavage.

(Figure 32) Sandstone bed at locality 6.

(Figure 33) Wavy lamination.

(Figure 34) Laminated tuffs of the Beacon Hill Formation.

(Figure 35) Laminated tuffs at Beacon Hill, with Loughborough in the background.



Walk 1: Buck Hill, Out Woods and Beacon Hill. Map.



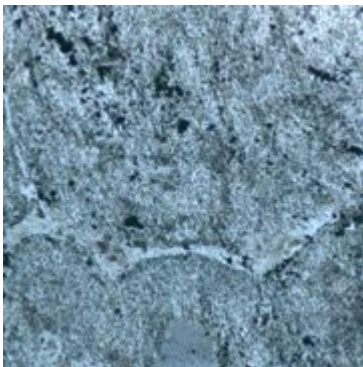
Crag exposing the Outwoods Breccia.



*Mudstone fragments in the Outwoods Breccia.*



*Rocks at locality 4. Left: Microscopic particle of volcanic ash from Buck Hill rock.*



*Microscopic particle of volcanic ash from Buck Hill rock.*



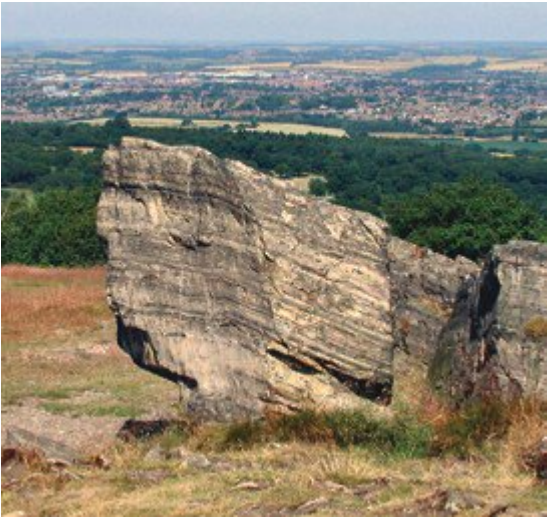
*Sandstone bed at locality 6.*



*Wavy lamination.*



*Laminated tuffs of the Beacon Hill Formation.*



*Laminated tuffs at Beacon Hill, with Loughborough in the background.*