
Sandpit Hole and Bishop's Lot

[ST 532 498], [ST 550 495]

Highlights

Sandpit Hole and Bishop's Lot are two of Mendip's largest dolines. Sandpit Hole is a good example of a typical deep rocky doline, while Bishop's Lot is a broad, shallow, saucer-shaped doline.

Introduction

These two separate dolines are located about 4 km north of Wells and are developed on the flat surface of the Mendip plateau (Figure 5.1) and (Figure 5.15). They are of particular interest because they constitute two of the largest unfilled dolines on Mendip, and have distinctly contrasting morphologies. Both are developed on the Carboniferous Limestone and have been cited as evidence for the various theories which have been proposed for the formation of Mendip dolines (Stride, A.H. and Stride, R.D., 1949; Balchin and Coleman, 1959; Ford and Stanton, 1968), a resume of which is given by Smith (1975a). Both have been dug by cavers at some point, and the details of the digs at both sites are described in Barrington and Stanton (1977).

Description

Sandpit Hole is a large pit about 12 m deep and less than 50 m in diameter, with steep sides and a cliff face along one side containing several small caves. Sediment on its floor is a dolomite sand, which is largely a solutional residue left behind as a result of the weathering of granular dolomite. Below the floor, excavations by cavers show that limestone boulders continue to a depth of at least 16 m below the plateau surface. It is a fairly typical example of a Mendip doline, as yet unfilled.

Bishop's Lot is a large almost circular depression with a shallow saucer-shaped profile; it is 11 m deep and over 200 m in diameter. The margins are poorly defined and digging by Balch, around 1900, revealed a thick deposit of clay on its floor. Its morphology provides a clear contrast to that of Sandpit Hole.

Interpretation

Stride, A.H. and Stride, R.D. (1949) interpreted Sandpit Hole as being formed as a result of cavern collapse as did Coleman and Balchin (1959). More recently Ford and Stanton (1969) attributed the formation of dolines to gradual solution working down from the surface along joints, and deepened by the breakdown of the limestone at the top of the fissures. The origin of Sandpit Hole appears to be a combination of subaerial and under ground solution, undercutting and collapse of the limestone; the buried limestone boulders indicate the nature and scale of the collapse.

The nearby Whitepit closed depression, which is similar to Sandpit, has recently been excavated to reveal a cave at shallow depth. Directly below the surface depression, the cave passes through a debris pile at least 10 m across; the debris consists mainly of rounded limestone blocks, and appears to be derived largely from the rockhead zone of weathering. At Whitepit, it appears that an older open cave at a shallow depth has aided leakage of water into the limestone overlying the cave, accompanied by ravelling and partial collapse of the limestone to form the depression. It is possible that a similar mechanism can be invoked for Sandpit Hole, although more digging would be required to confirm this.

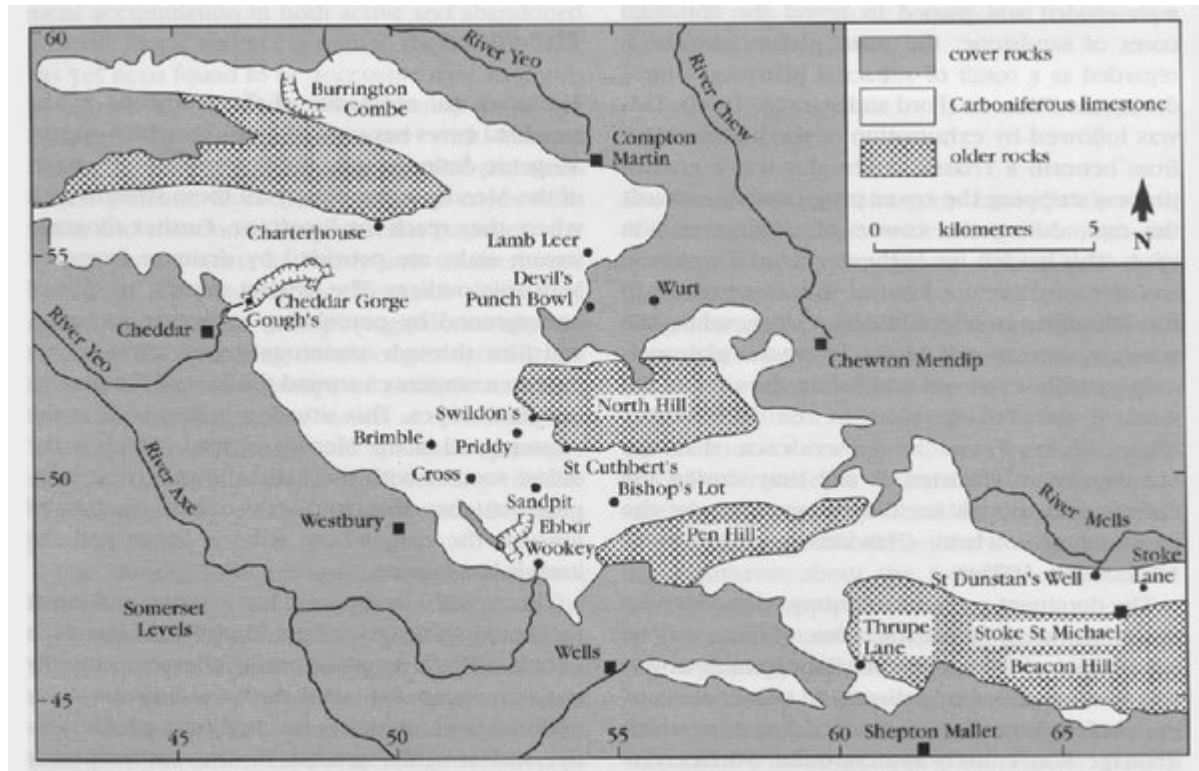
The evolution and deepening of the Bishop's Lot doline appears to have been dominated by solution rather than collapse. However, as almost nothing is known about the subsurface structure, the relative importance of subaerial solution and collapse cannot be estimated. It may represent an early form of the larger depressions, which include Brimble Pit and

Cross Swallet, where premature leakage precluded any significant ponding and therefore prevented lateral expansion.

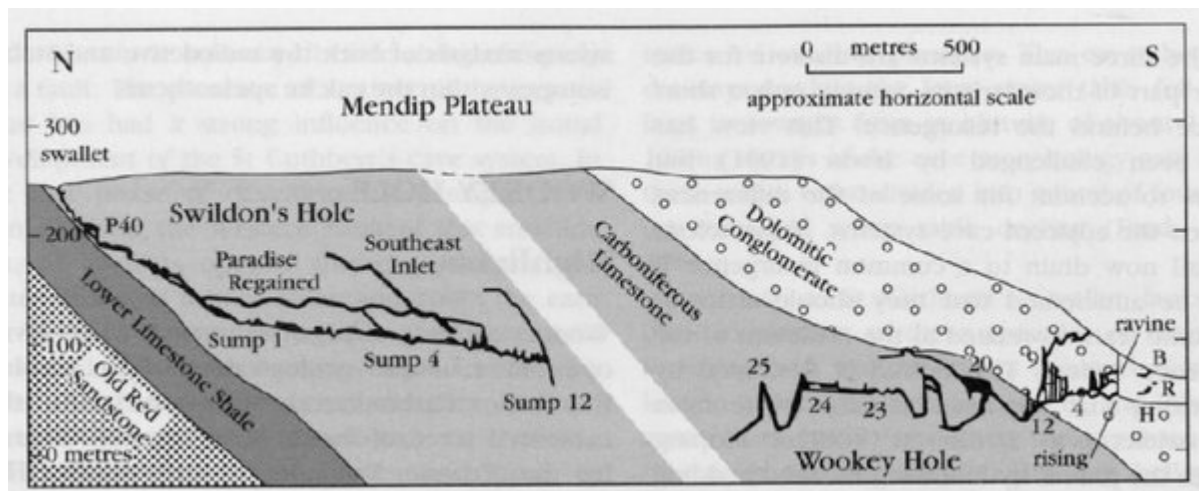
Conclusions

Two of the largest isolated dolines on Mendip have been formed by a combination of solution and collapse, and are typical of most of the depressions on the karst plateau. The two provide clearly contrasting morphologies, and represent opposite ends of the spectrum of processes and morphologies exhibited by the Mendip dolines. Sandpit is a steep-sided doline with rock walls and a floor of boulders continuing to depth, which may have been formed by collapse into an underlying cave. Bishop's Lot is a much broader, shallow depression, with a thick clay floor, developed mainly by solutional processes.

References



(Figure 5.1) Outline map of the Mendip Hills karst, with locations referred to in the text. Cover rocks are mostly the Triassic and Jurassic mudstones and limestones; Upper Carboniferous rocks form the thrustured outlier on the east side of Ebbor Gorge. The Triassic Dolomitic Conglomerate is included with the Carboniferous limestone where it is composed of blocks of the limestone and is an integral part of the karst. Older rocks are the Devonian Old Red Sandstone and the Dinantian Lower Limestone Shale.



(Figure 5.15) Semi-extended profile through the cave system from Swildon's Hole to Wookey Hole. The gap in the middle has not yet been reached by underground explorations; the distance between the explored limits of the two caves is about 2.3 km, and the vertical scale is exaggerated by five. The small caves in the ravine are keyed as: B = Badger Hole; R = Rhinoceros Hole; H = Hyaena Den (after drawings by W.I. Stanton).