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# Poole's Cavern

[SK 050 725]

## Highlights

Poole's Cavern is a large section of cave passage with an underfit stream fed by karst drainage from the south. A proven hydrological link with nearby thermal springs provides valuable information on the nature of recharge to such phenomena. Stalagmites which have developed on gas pipes within the cave provide important data on the growth rate of speleothems.

## Introduction

Poole's Cavern lies north-east of Stanley Moor, and represents the only significant length of accessible cave passage within the catchment of this upland karst (Figure 4.1). Several sinkholes lie close to the boundary of the overlying shale on Stanley Moor. All drain to a series of resurgences in the floor of the Wye Valley at Buxton, and several drain via Poole's Cavern in all but very low flow conditions. Although the flow route is confirmed by dye tests, passage sizes at the sinkholes are small and none of the cave streams can be followed far underground. Poole's Cavern is the only large cave in the area. Coal fines were formerly stored in the Grinlow quarries, midway between Stanley Moor and Poole's Cavern, and have appeared in Poole's Cavern and at the Buxton hot springs, suggesting that some of the cave stream joins the hydrothermal system after leaving the cave.

The caves and hydrology of the area have been discussed by Ford (1977c), Gunn and Edmans (1989) and Ford and Gunn (1992), and the passages in Poole's Cavern were described by Gill and Beck (1991).

## Description

Poole's Cavern is currently operated as a show cave. Though only 240 m long to a boulder choke, it has an impressive main passage up to 20 m high and wide; this is an excellent example of solutional enlargement in a dense system of beddings and joints, with solutional undermining and collapse. Subsequent vadose erosion has removed most of the fallen blocks. The cave contains good examples of stalactites and a massive bank of flowstone with large gour terraces. Pitty (1969) has used this site to ascertain the difference in response times of percolation water and stream water in order to distinguish contrasting residence and through flow time of different components of the karst groundwater. The entrance passages contain thick sediment sequences, yet to be documented in detail, which have yielded Pleistocene mammal bones and include undisturbed stalagmite layers; Romano-British material lies on the Pleistocene silts. Further sediments were excavated from the cave entrance by Victorian archaeologists, but the finds were poorly recorded and preserved.

## Interpretation

The phreatic origins of Poole's Cavern and its position adjacent to the modern Buxton valley suggest a considerable age for the cave and a history which may extend as far back as the Anglian glaciation. The undisturbed bone deposits and stalagmite layers provide a record of Pleistocene events and climatic change in this area, with the possibility of absolute dates being obtainable from the stalagmite layers. An unusual feature is the stalagmite columns, which have been deposited up to 100 mm high on a century-old gas pipe; they provide data on the growth rate of speleothems, but their development may have been influenced by lime-burning in Grin Woods above. Some of the stalagmites have unusual colouring distinguished by their resemblance to poached eggs.

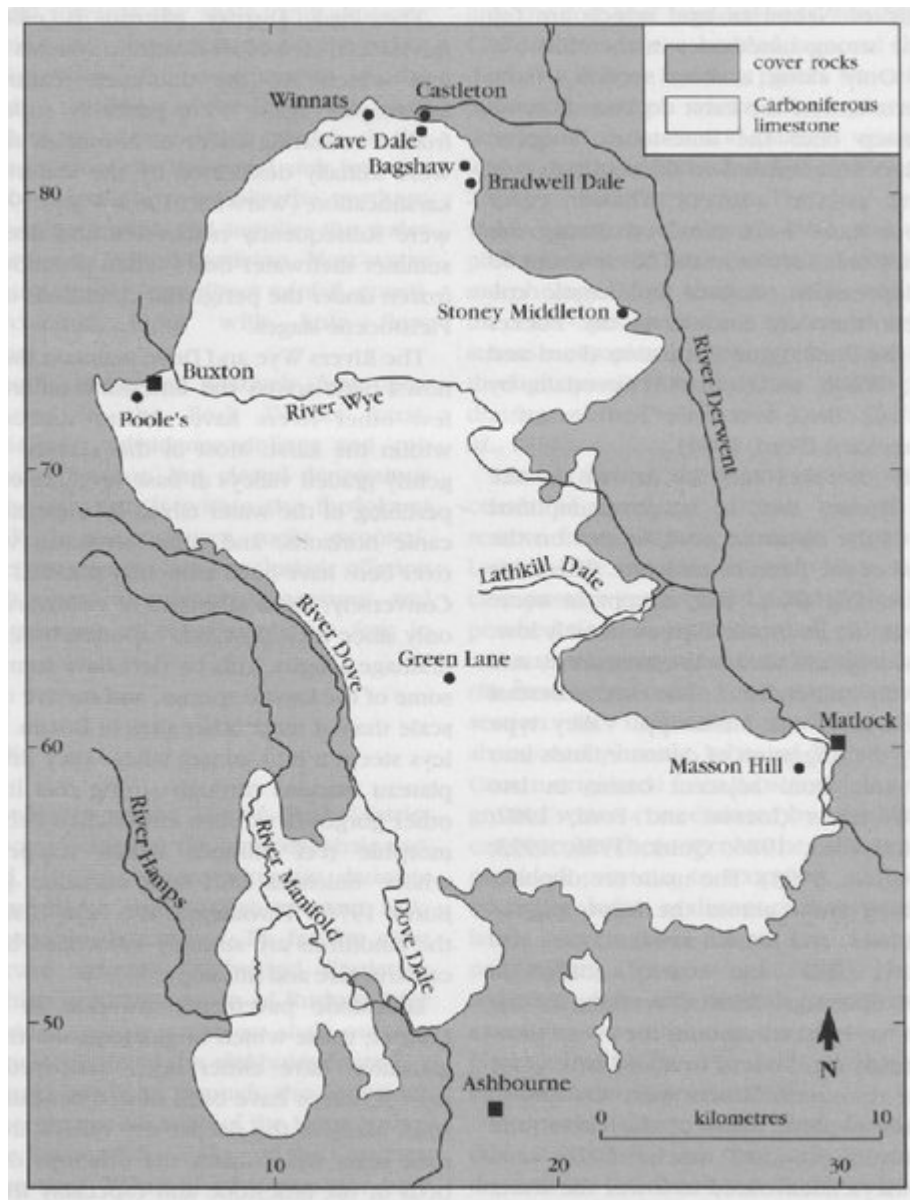
Poole's Cavern represents a former resurgence for the area. The main underground drainage now takes a different route, probably via Green Lane Pot [SK 050 726], to the resurgences at Otter Hole [SK 046 733] and Wye Head [SK 050 751],

both about 45 m lower. Although the hydrology of the area appears fairly simple, the connection with the Buxton hot springs suggests that some of it follows a much deeper phreatic route which is probably fault-guided. Alternatively, the shallow drainage from the Stanley Moor sinkholes has intercepted an independent, deep phreatic system. Tritium contents of the Buxton spring water shows that it has been underground only for 15–20 years; it appears to be meteoric water which has passed through unusually deep systems of karstic fissures (Ford, 1977c).

## Conclusion

Poole's Cavern is an isolated segment of large cave passage containing clastic sediment deposits which incorporate both vertebrate remains and stalagmite layers. This sequence preserves a valuable record of climatic and geomorphological change in this area through the Pleistocene. The karst hydrology of the area encompasses both the shallow drainage from moorland sinkholes and also the deep recharge to thermal springs.

## References



(Figure 4.1) Outline map of the Peak District karst, with locations referred to in the text. The cover rocks are Namurian shales and sandstones, and younger stratigraphic units.