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The “gulfs” of Greenhow Hill, North Yorkshire, UK: further notes and an example from Ireland

P J Murphy [1], S Everett [2] and P Barry [3]

[1]: School of Earth and Environment, University of Leeds, LS2 9JT, UK.

[2]:12 Sawley Close, Embsay, North Yorkshire, BD23 6QY, UK.

[3]: 43 Kinvara Road, Navan Road, Dublin, D07 Y512, Republic of Ireland.

Abstract

Vertical sediment filled cavities were encountered by miners in the Greenhow Hill mining field. Here a large vertical solution cavity is described from Ireland which has many similarities with the gulfs of Greenhow Hill. This occurrence suggests these features may be more widespread than originally thought.

The presence of sediment-filled, near vertical solution cavities, referred to locally as ‘gulfs’ or ‘gulphs’, cutting across productive veins in the Greenhow mining area has been recorded by Varvill (1927 pp503–504), Dunham and Stubblefield (1945) and Gill (1998). These have been described as either swallow holes or caverns developed along or across the productive veins. The cavity walls appear water worn, either smooth or scalloped. Some gulfs occur where a vein is cut by a cross vein, but others are not related to cross veins. These are distinct from the mainly horizontal passages in the Stump Cross–Mongo Gill cave system developed in rocks affected by the Nussey Knot anticline to the east (Long, 2017).

The intersection of a number of gulfs by Coldstones Quarry [1] and the reopening to visitors of Gillfield Level [2] enabled the re-examination of these features. Gillfield Level intersects Waterhole Vein, which exposes a number of gulfs of various dimensions. A review of the origin of the gulfs and the significance of the sediment fill was published by Murphy and Everett (2013), who suggested that they pre-date at least one of the Pleistocene glaciations. Comparisons with other large phreatic cavities within other mineralized karst areas of the UK were undertaken, but since that study an analogous feature, named Barton’s Hole, on Truskmore Mountain, County Sligo, Ireland has been explored and described (Barry, 2015).

The large natural shaft of Barton’s Hole (Irish Grid Reference: G 72887 45826), believed to be named after a local mine manager from the 19th century, occurs on a large vertical mineral vein that was mined for baryte from the 19th century until 1979, but was most heavily mined during the North Sea drilling boom of the 1970s (Fig.1). Below an entrance that is 8m-long by 5m-wide a 60m-deep shaft bells out to far larger dimensions (Fig.2). Miners cleared the shaft of fill between 1962 and 1978, and the first recorded descent of this impressive feature was carried out in February 2013 by a team from the Shannon Group cave exploration collective [3](Fig.3). The fill, consisting of clay and boulders, also contained lumps of baryte. This sounds very similar to the description of fill from a gulf on the Galloway Vein given by Dunham and Stubblefield (1945) of clay containing water-worn boulders along with large patches of fluorspar and galena. Water worn blocks of mineral vein material were often incorporated into the fill on Greenhopw Hill including a block of galena weighing 700kg which was recovered from a gulf encountered in Coldstones Quarry. Logs of boreholes drilled during the early 1970s suggest that there are other filled cavities along the line of the vein that continue northwards from Barton’s Hole.

In a number of ways this is a far better fit for being a gulf than the examples from other karst areas that were discussed by Murphy and Everett (2013). It occurs directly on the vein, it is of similar dimensions to the cavities described at Greenhow, and it contained sediment fill similar to some of those described from Greenhow Hill, which included a significant component of vein-derived material.

Results of the exploration of Barton's Hole suggest that Gulfs are not unique to the Greenhow Hill mining field of North Yorkshire.

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References

Barry, P, 2015. The undescended pit. Descent, 245, 16–18.

Dunham, K C and Stubblefield, C J, 1945. The stratigraphy, structure and mineralisation of the Greenhow mining area, Yorkshire. Quarterly Journal of the Geological Society of London. Vol.100, 209–268.

Gill, M C, 1998. The Greenhow Mines. British Mining, No.60. [Northern Mines Research Society.]

Long, H, 2017. Caves from Greenhow Hill to Cracoe. Chapter 28 in Waltham, T and Lowe, D (eds), Caves and Karst of the Yorkshire Dales, Volume 2. [Buxton: British Cave Research Association.]

Murphy, P J and Everett, S, 2013. The 'gulfs' of Greenhow Hill, North Yorkshire, UK. Cave and Karst Science, Vol.40(2), 87–91.

Varvil, W W, 1927. A study of the shapes and distribution of the lead deposits in the Pennine Limestones in relation to economic mining. Transactions of the Institute of Mining and Metallurgy, Vol.46. 463-559

Web References

[1] http://www.hanson-communities.co.uk/en/sites/coldstones-quarry-community-page

[2] http://www.gillfield.org.uk/

[3] https://sites.google.com/site/shannoncavegroup/Home

Figure captions:

Figure 1: The surface opening of Barton's Hole. The barite vein on which the shaft is formed can be seen as a white streak crossing the vegetated area above the red-suited caver. (Photo: Petie Barry, Shannon Group.)

Figure 2: Descending the Barton's Hole shaft. (Photo: Robert Mulraney, Shannon Group.)

Figure 3: Survey based on detail from Sligo Bay Barytes Co. 1978. Barton's Hole detail added by P Barry, 2013 – BCRA Grade 2. (Survey supplied by P Barry.)