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McGanns Cave, Ballycahill, Co. Clare

By
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ABSTRACT. McGanns Cave, located on the northwest flank of Aillwee Hill, Co. Clare, consists of a single horizontal passage some 204 m. long. The original passage was of considerable dimensions but it is now largely infilled over much of its length. The cave is almost fossil but once functioned as a major resurgence, possibly carrying glacial meltwater for a relatively short time. The cave is little influenced by local geological or hydrological controls and thus differs markedly from the majority of caves in this area of Co. Clare.

INTRODUCTION

McGanns Cave is located on the northwest flank of Aillwee Hill on the boundary between Ballycahill and Ballyallaban Townlands (G.R. Clare 5, 26.9 in. E., 15.6 in. N.). The entrance at 90 m. O.D. is in the lowest of the limestone scars that characterise the hill. The cave was discovered and explored by a local farmer, Mr. McGann, during the 1940's and without his assistance it is improbable that cavers would have stumbled upon the entrance which is a low bouldery tunnel only visible from a few metres away.

The cave was explored in April 1973 and surveyed and photographed in July 1973. The terminal boulder choke has been subjected to desultory digging. The length of surveyed passage is 204 m. and the cave is horizontal.

CAVE DESCRIPTION

A plan survey and longitudinal section of the cave together with typical passage cross-sections is given in *fig. 109*.

The entrance is partly filled with boulders and is an insignificant opening at the foot of a scar some 3 m. high. The entrance area has been much modified by frost-shattering. For the first 60 m. the cave is a crawlway, on average 0.9 m. high and 1.2 m. wide with a floor of mud and large scattered boulders. Just inside the entrance are the remnants of a badger den. At the end of the crawl is a small chamber - Horse Haven - some 1.6 m. high and 2.3 m. wide. The southern side of this chamber consists of a bedding plane roof with a mud floor and is open for some distance though only 20 cm. high. Horse bones, presumably brought in by a predator, were found in this area and the passage beyond is liberally smeared with bat guano. For some 30 m. beyond Horse Haven the route is a crawl around large fallen blocks, until, just

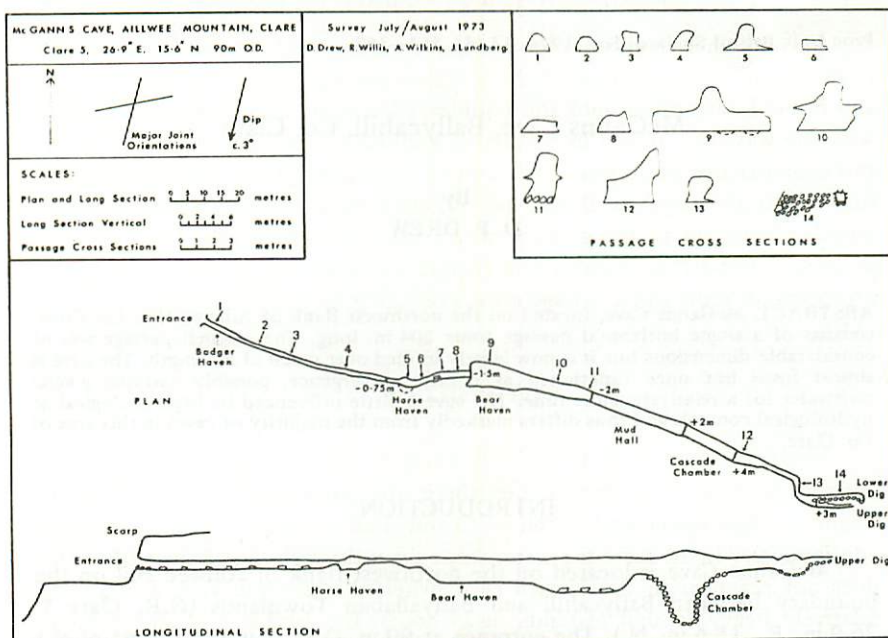


Fig. 109. Plan survey, longitudinal section and passage cross sections.

prior to section 9 the floor drops away in steps at the entrance to a large hall (Bear Haven). Section 9 typifies the western end of this chamber which averages 2.8 m. in height and 7 m. in width with a central notch in the roof corresponding to the entrance passage of the cave. The chamber was so-named because of the discovery of several shallow pits (0.5-0.75 m. deep; 1-1.5 m. wide), on the southern side of the chamber and one on the north side, with long scratch marks on the sides (Plate 25). These may possibly have been hibernation pits dug by bears. A bear tooth (*U. arctos*) was found closer to the entrance but no further evidence was forthcoming in support of this hypothesis.

At the eastern end of the chamber the mud floor becomes increasingly boulder-strewn and the passage width contracts to 2.5-3 m. A 2 m. climb over rocks and a similar climb down leads to Mud Hall, a perfectly straight chamber some 30 m. long, 4 m. wide and 4 m. high (Plate 26). When first explored this chamber contained fine mud formations and rimstone pools.

At the eastern end of the chamber the passage contracts and a scramble over boulders leads to Cascade Chamber the largest hall in the cave some 9 m. high and 3.5 m. wide. This chamber consists of a 6 m. deep hollow in boulders — the entrance passage continuing at its original level on the far side of the hall. The west side of the room is a steep boulder slope at 38°, whilst the eastern side is a vertical boulder wall. A major inlet in the roof has deposited a large cascade formation on the north wall and the whole area is well decorated with straws and rimstone deposits (Plate 27).

Beyond the chamber the passage continues for some 20 m. with a cross-section similar to that of the entrance passage though somewhat larger and floored with dried mud and boulders. The cave ends in a small chamber with the way on blocked by a calcited boulder choke. The southern wall of this chamber can be followed for some 8 m. until the floor rises almost to the roof whilst the north wall may be followed for a similar distance beneath unstable boulders to the point at which there is a major roof inlet. Further progress beyond this chamber will require a serious digging effort though the prospects for more open passage are encouraging.

HYDROLOGY

McGanns Cave is hydrologically fossil to the extent that it no longer contains a permanent stream, but there are major roof inlets in Cascade Chamber, Bear Haven and Terminal Chamber all of which appear to function continuously. In all cases the water seeps away through the boulder floor and does not reappear in the known cave. When the cave was visited following relatively heavy rainfall (40 mm. in 24 hours) the discharge of all the inlets was found to have increased 3-4 fold and the sound of running water could be heard beneath the passage floor in several places between Bear Haven and Horse Haven. Long sections of the entrance passage, of Bear Haven, and of Mud Hall had standing water up to 30 cm. in depth, suggesting that considerable modification of the cave is still occurring. Given these conditions, and despite the fact that the water is not flowing, it seems unlikely that the 'bear pits' could be of any great antiquity.

Water samples taken on four occasions from the Cascade inlet had calcium values within the range 120-140 ppm. and magnesium values of 5-6 ppm. The water was consistently supersaturated with respect to calcium but greatly undersaturated (10-15%) with respect to magnesium. These values are intermediate between those recorded for ordinary swallet water and percolation water derived from peaty regoliths on the western Burren.

The water from the inlet in the Terminal Chamber was traced to an intermittent spring in a gully some 400 m. horizontally westerly and 40 m. vertically below the cave entrance (see *fig.* 111).

CAVE GEOMORPHOLOGY

Although simple in overall morphology the cave exhibits features rarely seen in the caves of Co. Clare. The cave consists of a single passage largely oriented at 080° - 105° and completely horizontal. The dip of the strata in the area is $1-3^{\circ}$ to the south-southwest and thus the cave is aligned along the strike, much of the roof being developed at, or just into, a single bed rich in

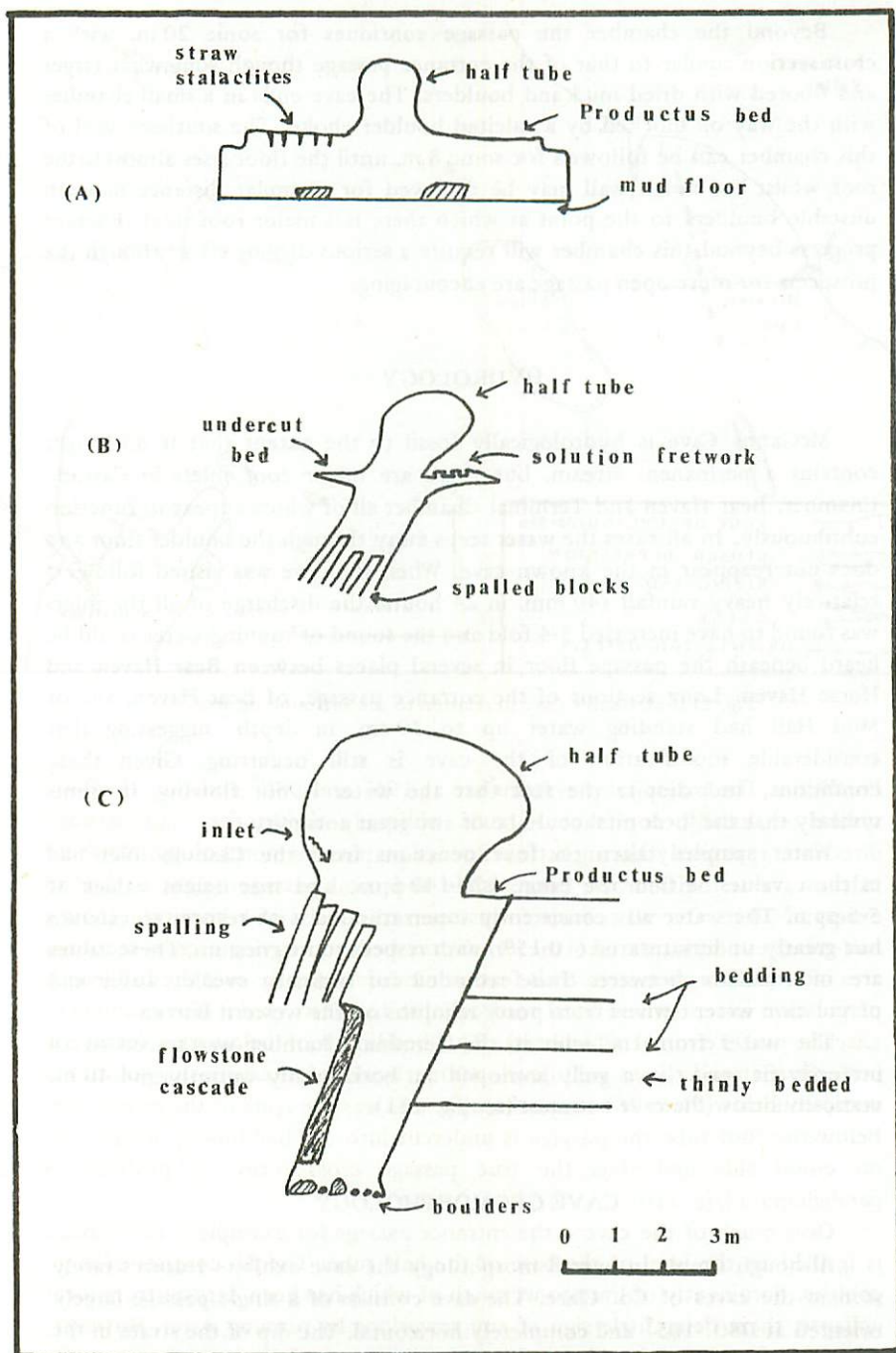


Fig. 110. Characteristic passage morphology. A. Bear Haven, B. Passage between Bear Haven and Mud Hall. C. Cascade Chamber.

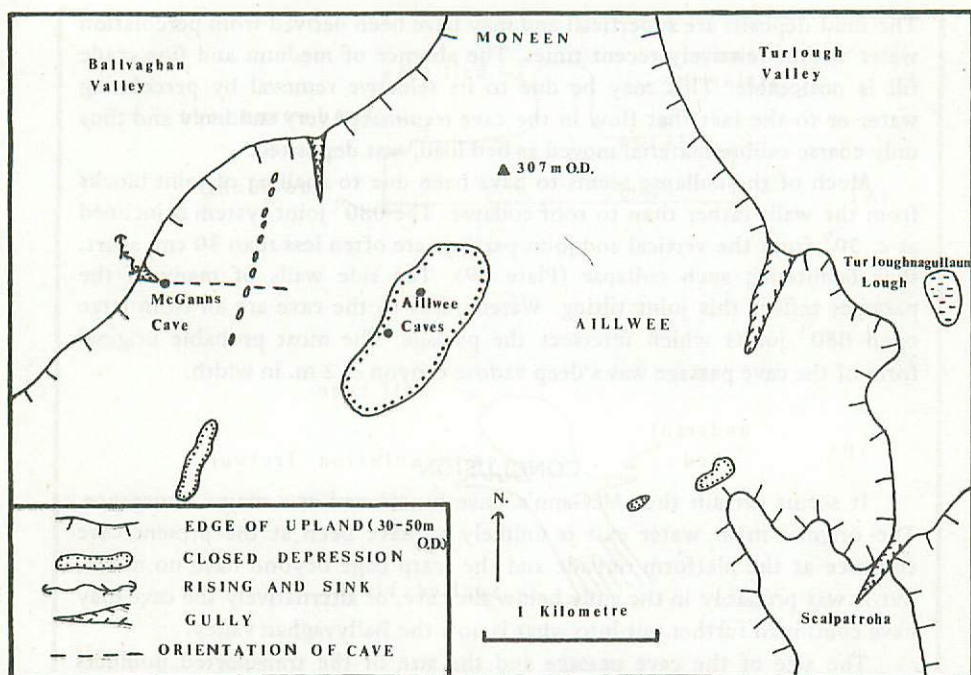


Fig. 111. McGann's Cave in relation to the surrounding area.

Productus. The major joint systems are at 196° and 080° and thus the 080° system — locally dominant — runs obliquely across the main passage direction, apparently having little influence on passage morphology. Nowhere in the cave is the bedrock floor visible and total passage height is thus in excess of 10 m. Overall passage forms seem to consist of a bore tube (now a half-tube) cut upwards into the *Productus* bed and having a cross-sectional area of *c.* 1.5 square metres. This feature meanders greatly over the full length of the cave except where local roof collapse has destroyed it (for example in Cascade and Terminal Chambers). The bedding roof below this feature is perfectly flat and shows well developed networks of anastomosing solutional micro-conduits (Plate 28) suggesting that this was the zone of the proto-cave. Below the roof tube the passage is undercut into the bedding by up to 3 m. on either side and thus the true passage cross-section is probably a parallelogram (fig. 110).

Over much of the cave — the entrance passage for example — the passage is infilled to the level of the base of the half tube. The fill consists of large cobbles, dominantly of limestone, much of which has been derived from local collapse, there being little sign of any reworking by running water. However, the presence of cobbles (up to 35 cm in diameter) of Connemara granite in the terminal boulder choke suggests that at least part of the fill is allogenic.

The mud deposits are superficial and may have been derived from percolation water within relatively recent times. The absence of medium and fine grade fill is noticeable. This may be due to its selective removal by percolating water or to the fact that flow in the cave terminated very suddenly and thus only coarse calibre material moved as bed load, was deposited.

Much of the collapse seems to have been due to spalling of joint blocks from the walls rather than to roof collapse. The 080° joint system is inclined at *c.* 30° from the vertical and joint partings are often less than 30 cm. apart, thus facilitating such collapse (Plate 29). The side walls of many of the passages reflect this joint tilting. Water inlets to the cave are all from large open 080° joints which intersect the passage. The most probable original form of the cave passage was a deep vadose canyon *c.* 2 m. in width.

CONCLUSION

It seems certain that McGann's Cave functioned as a major resurgence. The original main water exit is unlikely to have been at the present cave entrance as the platform outside and the scarp edge beyond have no notch, but it was probably in the gully below the cave, or alternatively the cave may have continued further out into what is now the Ballyvaghan valley.

The size of the cave passage and the size of the transported boulders imply a considerable discharge whilst the lack of structural control and horizontal nature of the cave imply flow under a considerable hydrostatic pressure. The source of the cave water is problematical. Although the line of the cave, if projected, would pass beneath the caves near Aillwee summit (*fig.* 111 and Drew 1973), a genetic relationship between the caves seems unlikely. It is equally improbable that McGanns Cave was originally the resurgence for a series of sinks on Aillwee Hill active whilst a shale cover existed on part of the hill. Consideration of catchment areas, local structure and geomorphological factors suggest that the risings for such sinks would like to the south, (*c.f.* present day drainage (Drew 1973)). It seems more probable on both internal and external evidence that McGanns Cave functioned for a relatively brief time as a subsurface route for glacial meltwater — presumably in association with the local penultimate glaciation. The source of water may either have been on Aillwee Hill or in the Turlough Valley to the east. McGanns Cave is located at the upper limit of the drift which covers the lower flanks of Aillwee Hill; the corresponding drift level on the west side of the Turlough Valley is at 150 m. O.D.

There is a cave system (Pollnamadraimarbh) of considerable antiquity at the same height as McGanns Cave on the southeastern flank of Moneen Hill above Scalp na Shesia some 5 km. northeast of McGann's Cave. It seems unlikely that this cave is the only one of its kind on the High Burren and the discovery of other such sites would throw light on the geomorphic history of this area.

ACKNOWLEDGMENTS

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REFERENCE

- DREW, D.P. 1973 A preliminary study of the Geomorphology of the Aillwee area, central Burren, Co. Clare. *Proc. Univ. Bristol Spelaeol Soc.* 13 (2), 227-244.



Plate 25. Part of one of the hollows in the mud floor of Bear Haven. Pug and claw marks on the side of the hollow are visible.
Photo: A. Wilkins.



Plate 26. The eastern end of Mud Hall looking towards the boulder pile at the entrance to Cascade Chamber. The roof half-tube is clearly visible.
Photo: A. Wilkins.

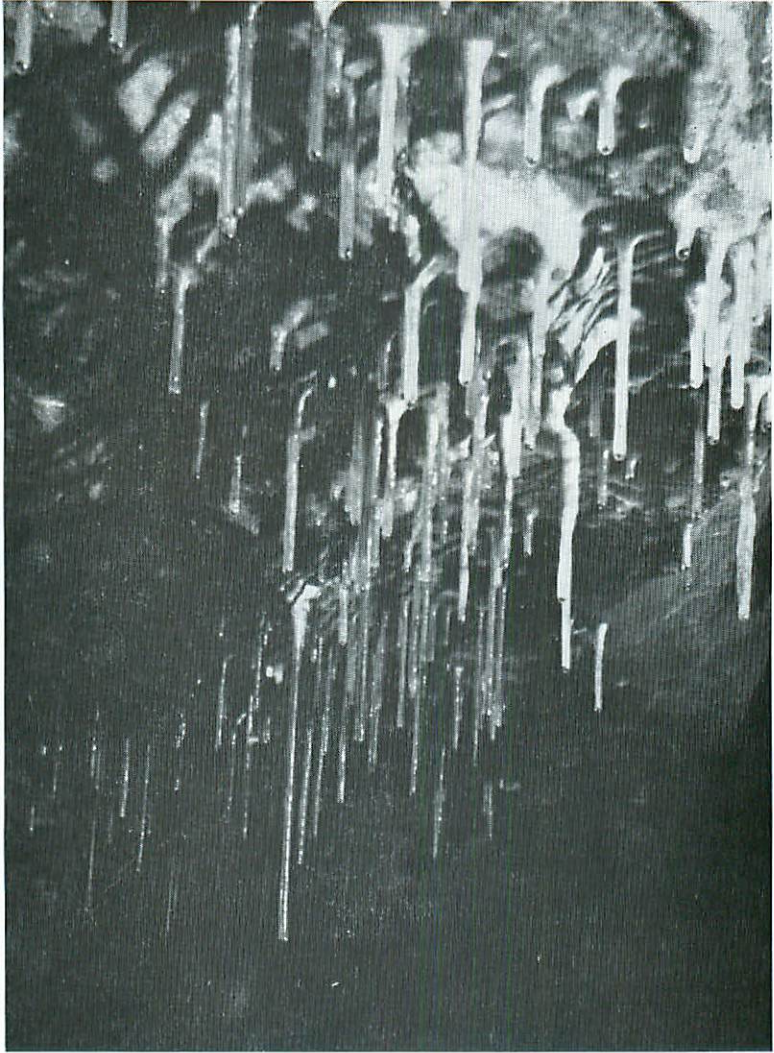


Plate 27. White straw stalactites on the roof of the north side of Cascade Chamber.

Photo: A. Wilkins.



Plate 28. Solutional fretwork in the roof bedding plane. Area shown is c. 1.5 x 1.0 m.
Photo: A. Wilkins.

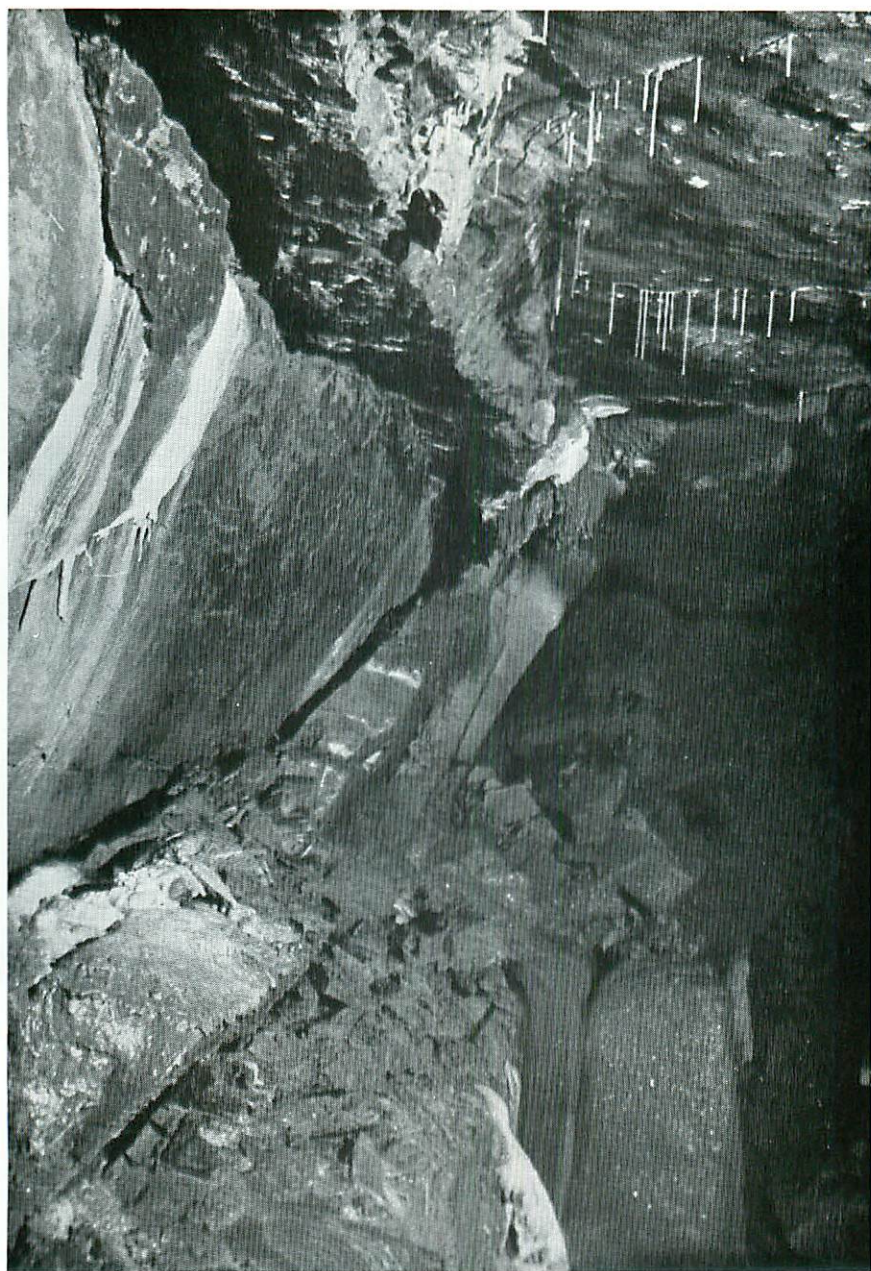


Plate 29. Tilted jointing in Cascade Chamber. Large blocks are spalling off from the passage walls. The top of the 'Cascade' of soft brown flowstone is at bottom just right of centre.

Photo: A. Wilkins.