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THE FORMOYLE EAST CAVE, Co. CLARE, IRELAND

By
C. C. SMART

O.S. 6 in. to 1 mile Clare 2 Entrance: E. 7.7 cm., N. 19.5 cm.

The Formoyle East Cave was discovered in 1971 and explored and surveyed in 1972 by the UBSS. The cave is in the townland of Formoyle East and lies in the true Burren, an extensive area of glacially eroded limestone. The entrance stands at about 190 m. O.D. on the eastern margin of a wide open valley running northeast from the Carha Bridge on the Cahir River, North West Clare. A small gorge about 20 m. across and 30 m. deep is incised into one of the structural terraces characteristic of this area and the cave lies at the mouth of the gorge, about 6 m. above the floor and in the eastern wall (*fig.* 112). A perennial spring now issues from the talus below the cave mouth.

The cave is an active resurgence with a flow of less than 5 $1.s^{-1}$, under the dry conditions in which it was observed, and is apparently now supplied by percolation and ground water as there is no shale or drift above the cave to collect and concentrate flow. No discrete swallet has been discovered as yet, although one may lie amongst the grikes of the terraced pavements overlying the cave.

The cave passage is a low winding canyon with a bedrock, pebble or gravel floor forming a series of pools and riffles (*fig.* 113). The final 26 m. of surveyed passage consists of a single pool. The cave continues as a very narrow canyon. From the entrance (0.5 m. by 0.9 m. high) the passage gradually changes shape, becoming smaller and assuming either a rectangular or 'T-shape' section. The present limit is narrower and higher (0.3 m. by 1.5 m. high) than the entrance. There are several tributaries only one of which is active and unblocked. The latter occurs 74 m. from the entrance and contains a small, calcite-blocked aven some 2.5 m. high 10 m. above the confluence. The tributary stream enters the aven at floor level from a low, bedding-plane type passage, which continues (section 11). This stream is depositing a soft, tubaceous calcite as far as the confluence. It seems that the major part of the pebbles have entered via this tributary. Some pebbles do occur in the main streamway up to beyond section 6 but they get progressively fewer and end. Other inputs consist of seepages from bedding planes.

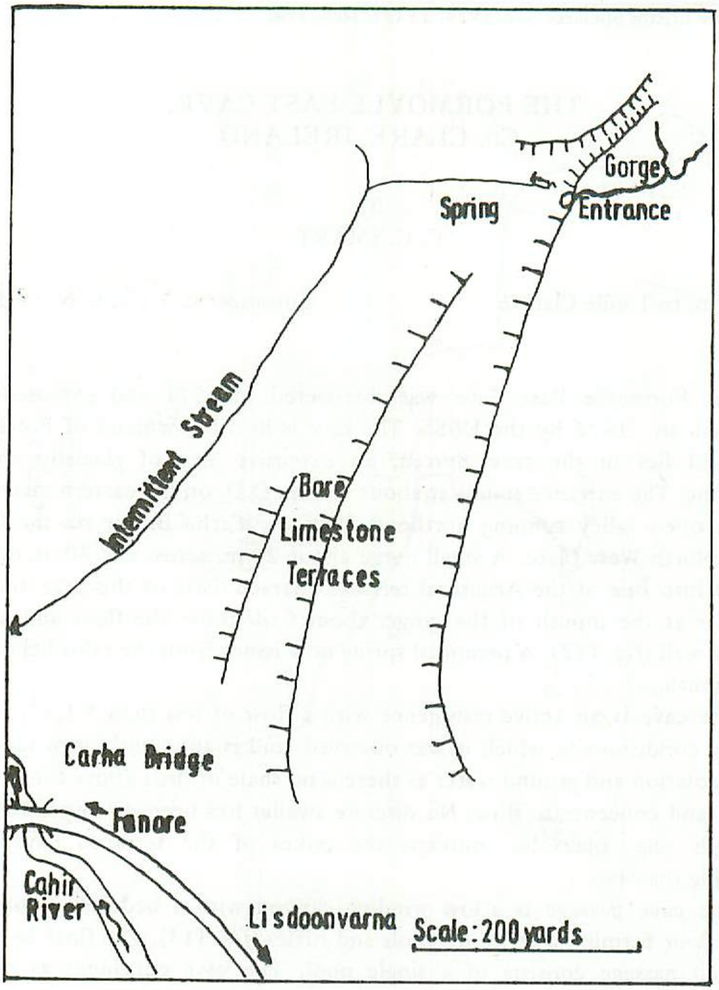

Fig. **112. Sketch map showing location of Cave.**

There are two ages and types of calcite deposit in the cave. Contemperaneous speleothems are generally small stalactites or straws, apart from the tufa noted previously. They consist of a hard crystalline core and a soft amorphous covering (*fig.* 114B). Often they have widened base with a botrioidal underside (*fig.* 114A). This may indicate a ponding level in the cave. The other calcite form is older and more massive, and appears originally to have comprised an extensive flow stone fill. The only *in situ* remnant of this fill is found at section 7. However, some of the clastic material present throughout the cave is composed of broken and re-eroded flowstone. In addition to limestone debris, pebbles, apparently of erratic

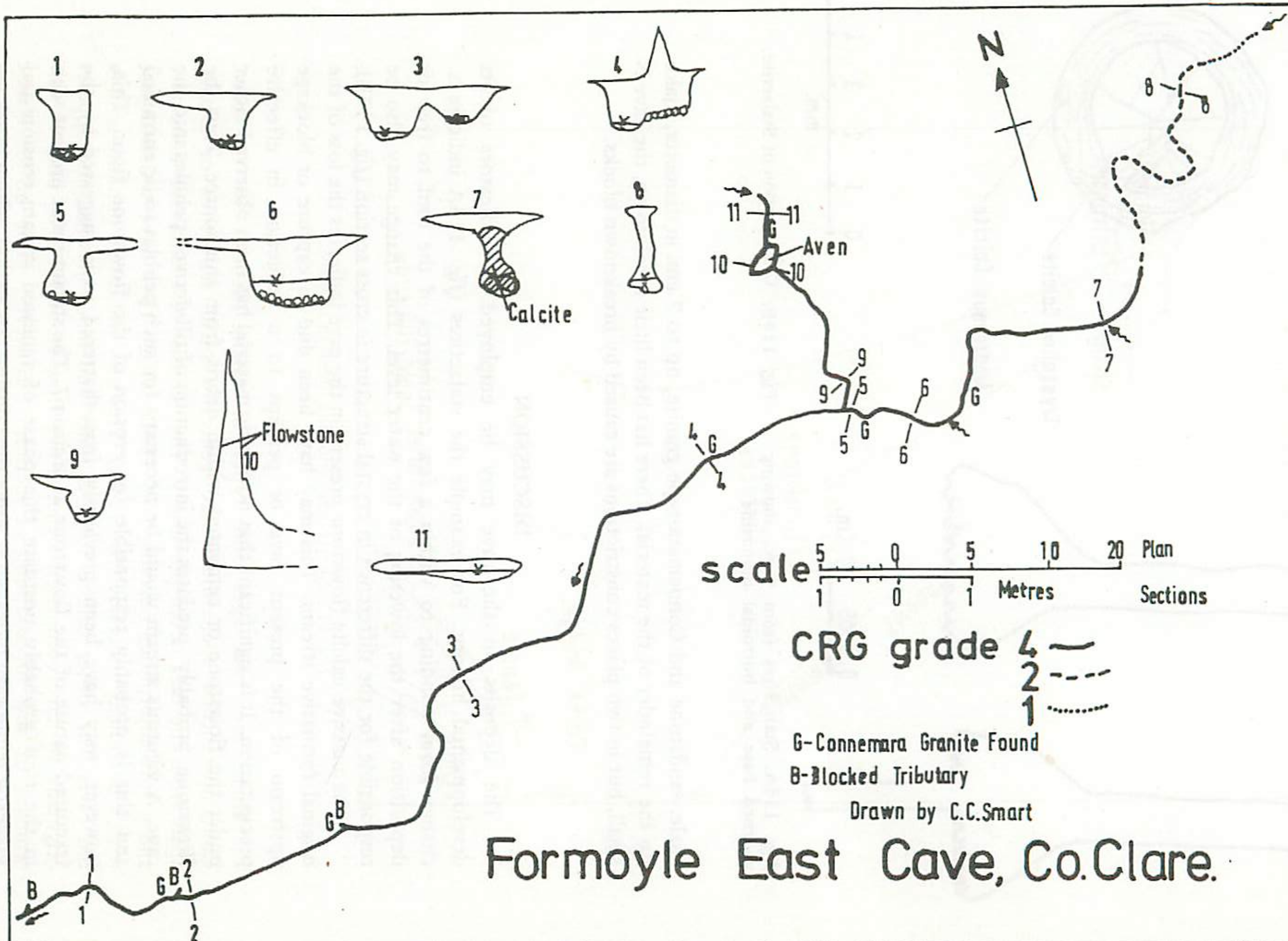
Formoyle East Cave, Co.Clare.
N
Aven
Calcite
Flowstone
scale
Plan
Metres
Sections
CRG grade 4
2
1
G-Connemara Granite Found
B-Blocked Tributary
Drawn by C.C.Smart

Fig. 113.

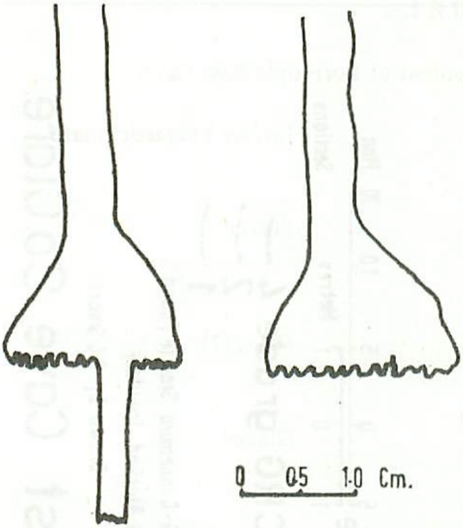

Fig. 114A. Stalactites from Cave, showing widened base and botroidal underside.

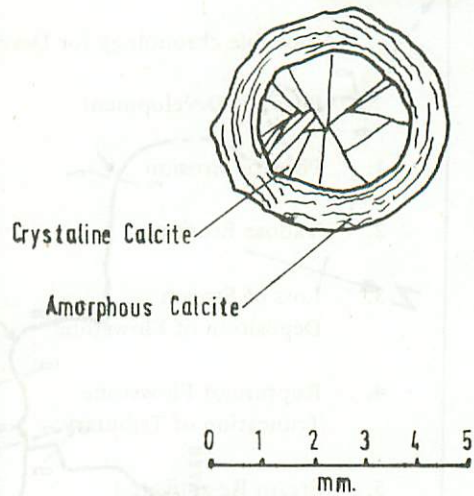

Fig. 114B. Cross-section of Stalactite.

shale, sandstone and Connemara-type granite, up to 7 cm. in diameter, make up the remainder of the material. There has been little breakdown, the cave is small, but in two places constrictions are caused by breakdown blocks.

DISCUSSION

The deposits in the cave may be employed as indicators of its developmental history. For example the stalactites (*fig.* 114A indicate a change from ponding to within a few centimetres of the roof to free air deposition after the lowering of the water level. This change may also be responsible for the difference in crystal structure in cross section (*fig.* 114B).

The massive calcite flowstone present in the cave indicates the loss of the original formative stream. This may have been due to capture or blockage upstream of the present cave or perhaps to a reduction in effective precipitation. It is significant that no erratic material has been observed either under the flowstone or cemented within debris from this source. Thus the flowstone probably predates the introduction of till-derived pebbles into the cave. A vigorous stream would be necessary for such pebbles to be entrained and this is probably responsible for erosion of the flowstone floor. This, however, may have been previously frost-shattered as is suggested by the fractured nature of the flowstone at section 7. The stalactites at present seen in the roof probably postdate this phase of renewed stream erosion and suggest a temporary blockage at some time during this period, which blockage has subsequently been cleared.

TABLE 1.

A possible chronology for Development of Formoyle East Cave.

	Phase of Development	Inferred Palaeoclimate
1.	Phreatic Erosion	Pluvial
2.	Vadose Erosion	
3.	Loss of Stream Deposition of Flowstone	Dryer(?)
4.	Rupture of Flowstone Truncation of Tributary	Glacial
5.	Steam Re-activated Erosion of Flowstone Introduction of Eratics (Surface Gorge Cut)?	Periglacial
6.	Ponding Stalactite Deposition	Pluvial
7.	Draining and modern vadose Erosion Some Speleothem Deposition	

The till pebbles must have been introduced through a reasonably large discrete conduit. This could have been a swallet, enlarged grike or truncated section of passage. The first appears unlikely as the cave is some hundred metres below the projected limestone-shale boundary. The cave has probably always derived its water only from percolation sources. Although it is not impossible that a grike some 10 m. deep could have developed to permit entry of such pebbles, it is thought most probable that the cave passage (probably the tributary) was opened by surface lowering. This idea is supported by the obviously truncated entrance. The explored part of the tributary has its head within a few metres of the side of the gorge marked on *fig.* 112. Any entrance that may be there is effectively concealed by scree.

The sequence of development postulated is more suggestive of the multiphase preglacial caves of Yorkshire, Mendip and other areas, than the single phase passages typical of Co. Clare. Table 1 sets out a possible chronology. It is also possible that an interstadial rather than an interglacial epoch saw the initiation of cave development.

The application of radiometric dating (Thompson 1970) to flowstone from the cave may reveal the validity of the scheme suggested in Table 1. Unitl then it remains wholly tentative.

REFERENCE

THOMPSON, P. 1970 A Method for Absolute Age Determination on Speleothems. *Canadian Caver* No. 3, p.8-18, No. 4, p 23-30.

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