

## Caves in the Tralee Area, Co. Kerry, Eire

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In April of 1962 a small party visited the area around Tralee, Co. Kerry. The object was to examine limestone of the area, taking special note of suggestions from Mr. J. C. Coleman, in the hope of finding a new caving

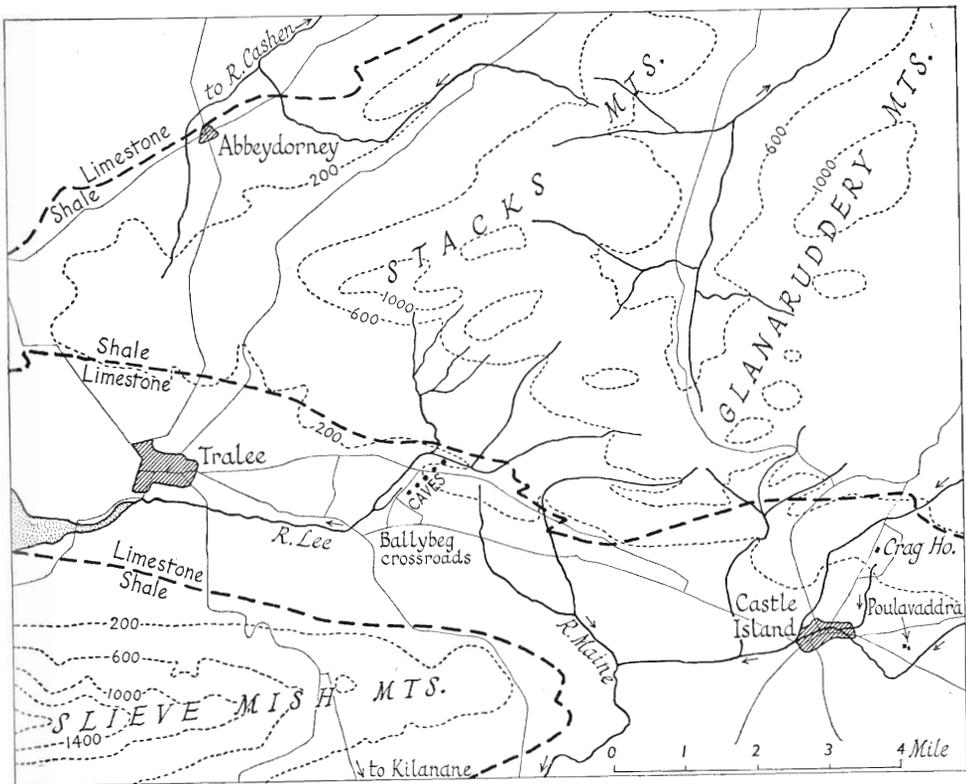


Fig. 25.—Map of the Tralee area, Co. Kerry, Eire. Based on the Ordnance Survey by permission of the Government of Ireland (Permit No. 333).

area. Coleman (1950) has described several small caves developed shallowly under the water table in this area and had drawn attention (*in litt.*) to other sites which might contain caves.

Both geologically and topographically the area can be divided into two sections (*Fig. 25*);\* first a coastal platform *c.* 100 ft. of Lower Carboniferous limestone. This is overlain by the shale and flagstone series which give rise to the second section, the Stacks and Glanaruddery Mountains to the north of Tralee and the Slieve Mish Mountains to the south. The limestone shale boundary follows, very approximately, the change of slope between the coastal platform and the highland. Throughout most of its length this boundary is covered by glacial drift which also extends over most of the lower land. Limestone outcrops are seen only as isolated hillocks. Thus water draining from the highland remains largely on the surface.

The party was very small and had only a short time available; even so a considerable area was examined. The caves already described by Coleman were not visited. An attempt was made to trace each stream as it crossed the limestone shale boundary. However, it is possible that some streams do sink below this and their dry valleys beyond the swallets are replenished by tributaries, as in the case of the Ballymacelligott Cave. The only way of proving this would be to follow each stream bed for a considerable distance. The countryside is not to be recommended for this since the thick thorn and gorse hedges, which defend both fields and possible potholes, are wellnigh impenetrable.

#### AREAS EXAMINED

##### STACKS AND GLANARUDDERY MOUNTAIN EDGES

(The following specific locations are from 6 in. I.O.S. map, Kerry Sheet 40.)

The streams running NW. off the Stacks Mountains to join the Cashen river remain on the surface, while the low area around the mouth of the Cashen, south of Ballybunion, is waterlogged, even where there is limestone.

The limestone around southern edge of the Stacks and Glanaruddery Mountains from Tralee to beyond Castle Island was more promising though nearly all the streams, with one exception, appeared to remain on the surface. At Ballymacelligott there is a cave system. The I.O.S. 6-in. map indicates a sink hole at Poulavaddra (E. 23.0 in. N. 13.0 in.) but on the contrary no streams sink in this area, though water may rise here under wet conditions. Poulavaddra is a group of five holes, some simply mud-filled depressions with limestone boulders, while two have open phreatic spaces at the bottom, with water. This showed no movement at the time of our visit and there is no directional scalloping on the rock.

In the Crag House area (E. 8.5 in., N. 20.0 in.) a stream which joins the River Maine sinks twice and rises three times in its bed. It is probably

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\* Map redrawn by Mr. H. Freke, Geography Department, University of Bristol.

the same water as is seen in two open rifts in a field to the north. The source of the water was not traced. Nearby are two large shakeholes.

#### OTHER LOCALITIES

(The following specific locations are from  $\frac{1}{2}$ -in. I.O.S. maps, Sheets 17 and 21.)

1. Kilnanare. (Sheet 20, long.  $9^{\circ} 38' 31''$  W. and lat.  $52^{\circ} 9' 12''$  N.)

Two streams end in a pool labelled Greasanelough on the map. A dry overflow channel from this pool ends in mud-filled crevices in solid limestone in a blind valley. Much labour would be required to open this. It is approximately 100 ft. I.O.D.

2. Three inliers of limestone are recorded by geological survey of Eire in the mountains NW. of Newmarket, Co. Kerry (around long.  $9^{\circ} 6' W.$ , lat.  $52^{\circ} 15' N.$ ).

This area was examined because the exposures are in valley bottoms at approximately 1,000 ft. I.O.D. On examination of these inliers it was found that glacial drift and/or alluvium cover the area, and the streams either remain on the surface or seep away through impenetrable cracks in quarry floors.

3. Further to the East are the Ballyhoura Mountains (long.  $8^{\circ} 35' W.$ , lat.  $52^{\circ} 18' N.$ ). Neither the  $\frac{1}{2}$ -in. topographical map of the area nor the 1-in. geological map indicates any swallets where the streams collected on the shale run off this on to the limestone. It is possible that some do sink and there may be passable caves there, but in the time available it was not possible to make a detailed examination. However, the south side of the ridge, when viewed from a distance, showed apparently uninterrupted stream channels crossing the limestone to run down to the River Awbeg in the valley.

In all the areas examined there are a few small caves, mainly, if not entirely, of phreatic origin in the low-lying limestone of the coastal plain. The cave systems are poorly developed and the openings are, in the main, merely unroofed parts of very shallow caves at or near the water table. Coleman (1950) has recorded one such small cave in which the direction of the waterflow changes with the state of the tide. In places there are small cave systems blocked with debris in the basal parts of limestone hillocks (or hums) which protrude from the plain. Further inland, where there is limestone at higher levels, the streams running off the shale continue on the surface to the main river in the valley bottom. Only at Ballymacelligott has the stream partially deserted its surface valley to pass through a cave.

It is concluded that, from a purely exploring aspect, Co. Kerry, around Tralee and eastwards towards Killarney, does not possess any worth-while systems comparable to those in Co. Clare and Co. Fermanagh. From the

aspect of geomorphology of the caves, the area is of considerable interest, especially as the caves appear to be post-glacial in origin.

## BALLYMACCELLIGOTT CAVES

(*Fig. 26*)

### INTRODUCTION

These caves are situated in the townland of Ballymacelligott, to the north of the Ballybeg crossroads, between Tralee and Castle Island, in Co. Kerry. (I.O.S. 6 in. to 1 mile, Kerry Sheet 30, E. 4.5 in., N. 8.5 in.) They lie in the angle of the River Lee where it runs west off the Namurian shales of the Stack Mountains, and turns south to cross the low carboniferous limestone corridor which crosses the watershed of the River Lee and the Little River Maine.

The caves are parts of an active system, presumably running close to the water table. The shape and dimensions of their passages are determined mainly by solution, and in several places they are still completely submerged. These submerged passages, and boulders from collapsed sections, make exploration of the full length of the system impossible.

The system, which obtains its water from sinks in the bed of the River Lee, runs roughly west at first, and then turns to the south, diverging uniformly from the surface river. This course is maintained for about half its length, after which it runs roughly south, parallel to the River Lee, and its waters rise a mile away on a bearing of about  $220^\circ$  from the highest sinks, losing 100 ft. in altitude over this distance. The stream then continues on the surface, eventually rejoining the River Lee. The similarity between the courses of the surface river and the cave system is close enough to make their derivation from common causative factors a possibility.

The accessible parts of the cave are reached from the surface via shake-holes, or unroofed sections, which occur along its length. These, and the sections of cave to which they give access, will be described in order from the sinks to the rising. The numbers 1 to 13 refer to those on the accompanying map of the area (*Fig. 26*). The view that these caves are all part of one system was supported by a C.R.G. Grade 2-3 survey and partly by the fact that while the upper parts of the cave, from Poul Dermot (3) southwards, were being explored, muddy water appeared at Poulatouirt (6).

Observations of water conditions recorded below were made during the unusually dry weather of April, 1962.

### SINKS OF THE RIVER LEE

At (1), nearly a mile after it flows on to the limestone, the River Lee is crossed at a ford by a farm track running roughly south-east to north-west. About 50 yd. upstream from this two-thirds of its water sank where the river

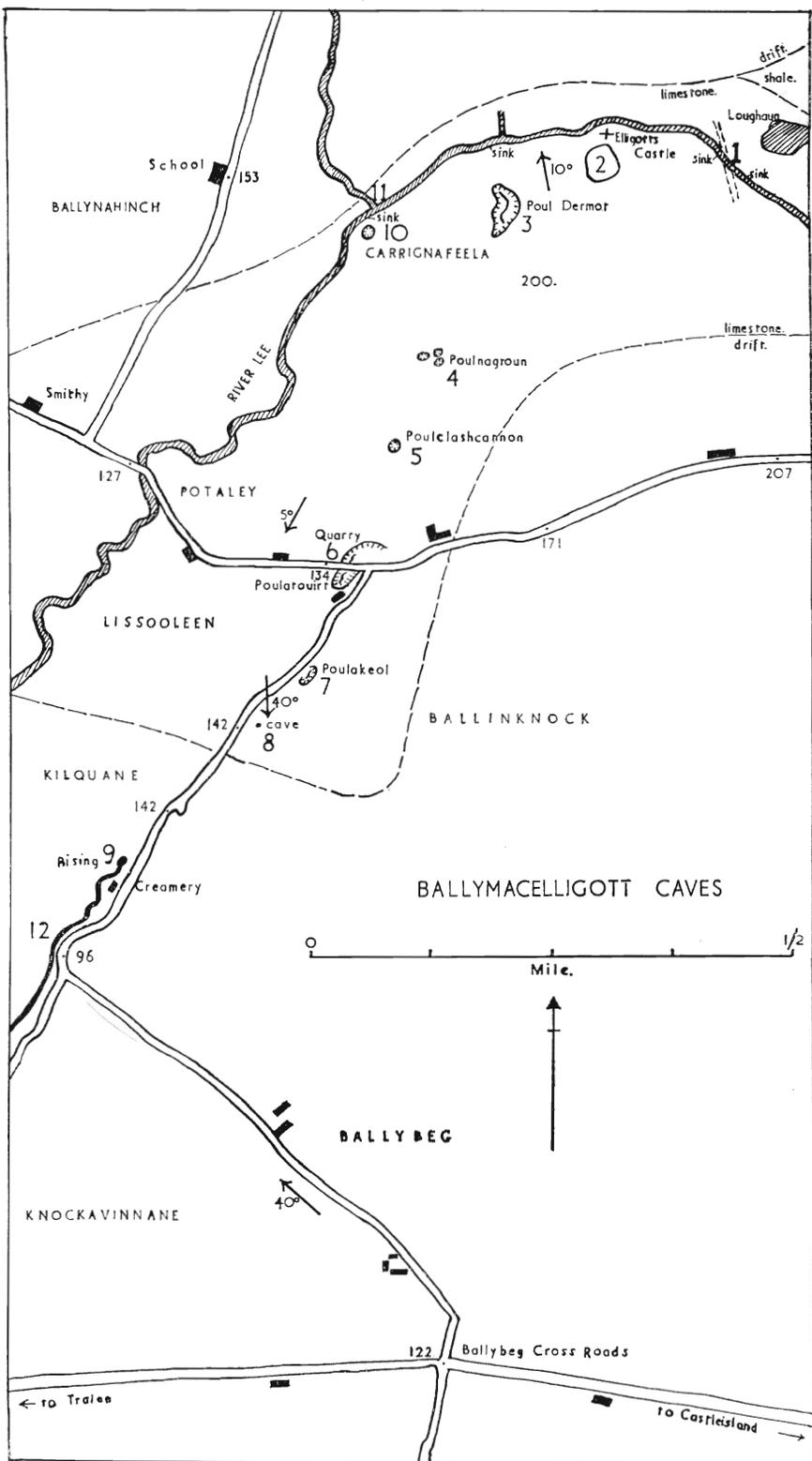


Fig. 26.—Map of the area of the Ballymacelligott Caves. Based on the Ordnance Survey by permission of the Government of Ireland (Permit No. 333).

has undercut the solid limestone of its south bank. A similar distance downstream from the ford the remainder of the water sank in various crevices again in the limestone of the south bank. Near this second sink, at the foot of the cliff forming the south side of the valley, about 3 ft. above the stream bed, a 2-ft. diameter tube can be followed roughly downstream. It ends in a tight vertical funnel through which a small cave stream can be seen.

The surface river bed was dry from this sink to where a small tributary crosses the drift/limestone boundary just to the north and joins the river almost opposite Poul Dermot (3). This water, however, sank in the south bank after a short distance, leaving the bed dry until the next and much larger tributary, again flowing off the drift just to the north, entered at (11). After this the river remained on the surface, although some water was lost through some more sinks in its south bank near a shakehole at Carrignafeela (10). The dry channel is *c.* 10 ft. wide and *c.* 6 ft. deep, cut into the limestone. Under wetter conditions it still carries water.

Another large shakehole at (2) lies roughly on a line between the upper sinks and Poul Dermot, and contains many tubes and other phreatic features in its limestone sides.

#### POUL DERMOT (3)

This is a large section of collapsed cave used as a drinking place for cattle. Upstream the water emerges through boulders and the cave cannot be followed. Downstream it is passable to beyond Poulclashcannon (5).

Between Poul Dermot and Poulmagroun (4) the cave passage is large, being up to 50 ft. wide and 15 ft. high, has a wide arched roof and is well decorated, mainly with calcite flow formations.

#### POULMAGROUN (4)

This is actually three large shakeholes all leading into the sides of a wide arched chamber, *c.* 100 ft. wide and *c.* 40 ft. high, through which the stream flows. The passage downstream from this chamber is rather smaller than upstream, being *c.* 20 ft. wide and 5-10 ft. high.

#### POULCLASHCANNON (5)

This is another shakehole giving access to the cave a little to the west of the present streamway. This cave can be followed downstream for *c.* 500 yd. along the main jointing (about 190°). It is practically straight, only moving west to another joint once, and is *c.* 6 ft. wide and *c.* 12 ft. high. The whole passage dips down until the roof meets the water. At the sump the water is *c.* 3 ft. deep with soft mud beneath it. Considerable mud deposits were present generally in this part of the cave, on either side of the stream and extending over the walls and roof, suggesting that this section still floods to the roof.

## POULATOUIRT (6)

The cave is next seen as a short unroofed stretch in the Quarry to the north of the road at (6) and at Poulatouirt itself south of the road. It is too low to follow upstream but it can probably be followed downstream from Poulatouirt, but this was not confirmed. The lavatory of a house here discharges directly into the stream flowing through Poulatouirt.

## POULAKEOL (7)

Like Poul Dermot this is a large unroofed stretch of cave used by cattle as a drinking place. A passage, similar in all respects to that below Poulclashcannon, can be followed north upstream for *c.* 100 ft. straight along the main jointing until the roof meets the water at a sump.

Downstream the passage is of a different character and little influenced by the jointing. It is *c.* 10 ft. wide by *c.* 5 ft. high and can be followed to just past an entrance on the west from a small shakehole at (8). Here it breaks up into small tubular passages and sumps.

Several shakeholes in this area, all surrounded by barely penetrable thorn bushes, were examined, but only the one at (8) was found to give access to the cave.

## THE RISING (9)

Water wells up from a hole 2-3 ft. in diameter in the stream bed. Other crevices in solid limestone nearby contained water which appeared to be static, but may well be active risings under wetter conditions. The pool at the rising is used by cattle, a farm and several cottages as a water supply, after already having been used twice by cattle for drinking and other activities, and once as a lavatory sewer during its course underground. A little further downstream a creamery on its left bank uses this same stream as its water supply. The 6-in. Irish O.S. indicates a sink below this at (12). The area was examined and no sink was found. The river runs on the surface over glacial drift which covers the limestone from just north of the rising to a long way south.

## MORPHOLOGY

The cave meanders along most of its length but is considerably influenced, especially in the explored upper parts, by the major jointing, which is about  $190^{\circ}$ . The minor jointing has little or no influence. The parts of the cave explored from Poul Dermot to Poulakeol were found to follow this jointing closely, meandering to either side of one joint, and occasionally moving to the west to another joint in the same direction. The very straight sections downstream from Poulclashcannon and upstream from Poulakeol have already been described. Downstream from Poulakeol the cave meanders widely and moves a joint to the west at almost every meander.

The streamway gradient is scarcely noticeable in the parts explored, although gentle variations in the stream bed cause the depth of the water to vary between a few inches and 3 ft. The roof height varies considerably all along its length. On the whole it is higher in joint determined sections and lower when the passage meanders away from these. In the smaller parts of the cave the roof heights are 10–12 ft. where joint determined and 2–3 ft.

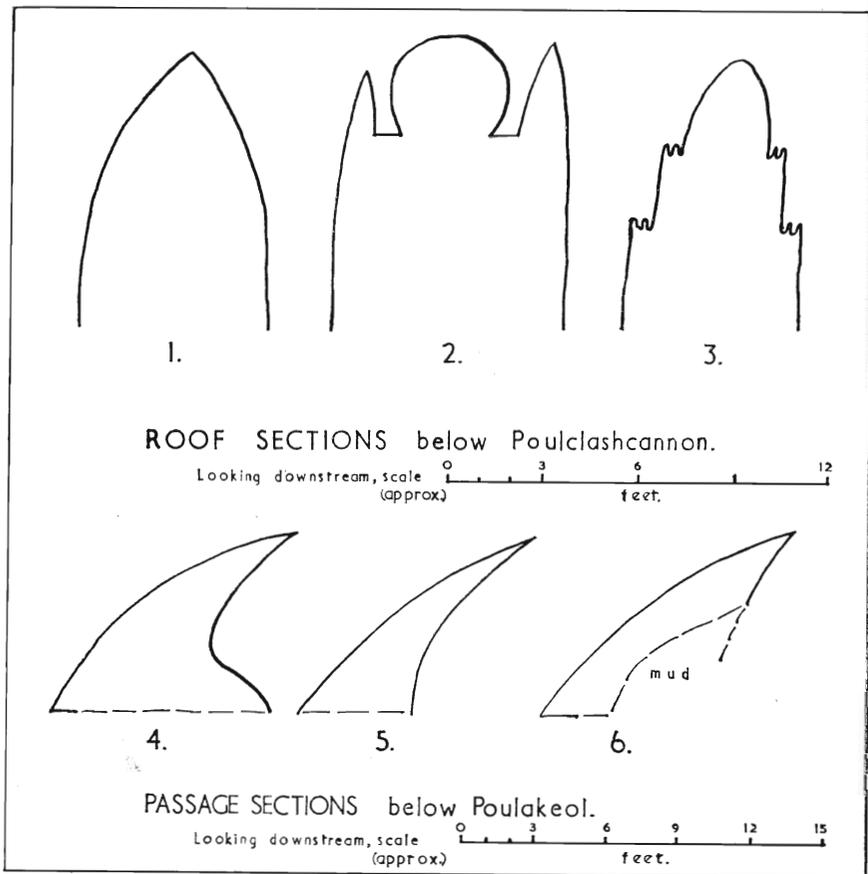


Fig. 27.—Ballymacelligott Caves. Sections.

elsewhere. Nowhere were flat roofs or T-sections at roof level, typical of caves in Co. Clare, seen.

Joint controlled passages tend to have half tube or gothic arch roof sections (*Fig. 27*, No. 1). Variations from these, for example below Poulclashcannon, are a three-quarter tube with a gothic arch on each side (*Fig. 27*, No. 2) and an arch cutting through more than one dissolved out bed, the remnants of which bear phreatically formed pendants (*Fig. 27*, No. 3).

Roofs in other passages tend to be symmetrical rounded arches in the upper parts of the cave and asymmetrical ones in the lower parts. *Figure 27*, Nos. 4-6, are examples from between Poulakeol and the shakehole at (8). This shakehole and Poulclashcannon enter the cave at the top right corners of sections similar to these. The presence of scallops on a vertical face in Poulclashcannon (5) suggests that it may be a collapsed vertical section of cave at this point.

The only part of the cave, apart from the various entrances, where the roof has been modified by rock falls is in the region of Poulmagroun, where large boulders occur in the streamway for about 100 ft. in both directions.

Phreatic features, such as pendants and tubes, from 2 in. to 3 ft. in diameter, are common throughout the cave.

Scallops were found on all surfaces, including the roof where low enough to be examined, indicating an appreciable water flow even when the whole system was totally flooded. Scallops at roof level were in the order of 1 in. in diameter and those at stream level about 4 in., suggesting that the water flow is now less turbulent and presumably slower.

No tributaries were found in the parts of the cave explored, but as the River Lee sinks in at least three places between (1) and where it passes Poul Dermot the water must enter as separate tributaries above Poul Dermot. Similarly if the water from the sinks at Carrignafecla (10) enters this cave at all it must do so in the unexplored section between Poulclashcannon and Poulakeol, or, less likely, between the terminal sump and the rising.

#### DISCUSSION

In the absence of T-sections at roof level, or significant dissolved-out beds elsewhere, there is little evidence in the cave itself to suggest that bedding has had any influence on the development of this cave. There is, however, evidence from dip measurements on the surface suggesting development influenced by the dip. The dip recorded on the Geological Survey of Ireland, Sheet 162 (Tralee), in the region of the east-west section of the River Lee to the north of the cave, is  $10^{\circ}$  to the north. Near Poulatouirt (6) it is  $5^{\circ}$  to the south-west, increasing to  $40^{\circ}$  due south near Poulakeol. A further dip record near Ballybeg cross-roads is  $40^{\circ}$  to the north-west. This suggests a gentle anticline with its highest point near Poulmagroun, where the roof height of the cave is at its highest, followed to the south by a steeper syncline with its lowest point not far from the rising. Between these two points the dip increases at first gradually towards the road and then steeply to the lowest point.

As the explorable cave passage is high in the upper section of the cave, with its maximum height at Poulmagroun, and rapidly decreases in height throughout the lower section, the correlation between roof height and dip,

at least in the upper explored parts of the cave, suggests development influenced by the dip. There is insufficient information, at present, about the uppermost unexplored lengths of cave on which to base any deductions of this nature. If any evidence of bedding control in the form of flat roofs existed, it will have been removed after the initial stage of development by upward solution during the phreatic, or later paraphreatic, stage.

In the lower parts of the cave its direction diverges well to the west of the direction of the dip recorded on the surface. There is, however, no real evidence that this part of the cave is not dip controlled, there being inadequate data on which to base a conclusion. This cave has a gentle gradient and in this one aspect it resembles the Clare caves. No explanation is offered for this fact. It should be remembered that in other areas, such as Sligo and Leitrim, the smaller caves, in general, descend very steeply.

The variable roof contours, the presence of scallops on all surfaces in the cave and its general position suggest that most of the development of the cave took place under phreatic and subsequently paraphreatic conditions, the present vadose stage being relatively unimportant. Parts of the cave are still permanently submerged and at least one other stretch still floods to the roof. If this conception is correct some or all of the present entrances to the cave may have been risings through the roof of the present cave system, which have been subsequently modified by collapse, each becoming abandoned for a lower one as the water table fell. This is supported by the fact that scallops, which would otherwise be difficult to explain, are present on the vertical face of at least one of the entrances, Poulclashcannon (5) which is apparently a vertical feature of the cave passage itself, now modified by collapse.

Such risings could only have been of a temporary nature, however, as no obvious stream beds have developed on the surface associated with these openings.

There is every indication that this system is a youthful one. Its development has followed on that of the surface river bed, which, in turn, is too small and too shallowly incised to be anything but a post-glacial development. Furthermore, the cave does not yet, even in very dry conditions, take all the water from the surface river. Future development must result in the cave system taking all the River Lee water, leaving the bed dry from the highest sink to the point where the cave water rejoins it, except, of course, where the tributaries from the north leave the shales and run for very short distances in the river bed before they sink.

#### REFERENCE

- COLEMAN, J. C., 1950, "Caves in the Tralee District", *J. Cork Hist. and Arch. Soc.* Vol. 55, 180-183.