

## Faunarooska Cave, Co. Clare, Eire\*

By

LT.-CDR. TREVOR R. SHAW and DR. OLIVER C. LLOYD

(Map ref.: O.S., 6 in. to 1 mile. Clare 4, 7.55 in. from east margin, and 9.60 in. from north margin.)

### SUMMARY

Faunarooska Cave, on the west side of Slieve Elva, was first explored by Bartlett, Balcombe, Pick and others in 1936 and 1937. The survey was started by the R.A.F. Coll. Potholing Group in 1952 and completed by the U.B.S.S. in 1957 and 1958. The 5543 ft. long cave is unusual in that it trends to the west, rather than to the south, and it goes deep. At 308 ft. it is the second deepest known cave in Ireland. It is named after the townland in which the entrance lies. The name is a combination of two Erse words, *Fauna* meaning slope or declivity and *Rooska* marshy, which together are a factual description of the townland.

### HISTORY

The cave was discovered by Balcombe, Bartlett and Sheppard, who first entered and explored it in April, 1936, but having no tackle with them did not descend the pitches until the following year. Pick was the first to go down these pitches, in March, 1937, while a month later Balcombe and Bartlett completed their exploration by doing the same. These authors praised the cave as being one of the finest in Ireland, both on account of its beauty, its sporting nature and its two exciting pitches. Besides, they discovered it! Those of us who came afterwards and had to survey it did not all carry away with them such a good impression. Brindle in 1952 described a visit to the cave in which he explored the streamway and descended the wet pitch. It is of interest that his party mistook the main entrance (Faunarooska I) and went in by the Faunarooska IV Entrance. On their return they missed their way and came out by the main entrance instead. The entrances to Faunarooska have been notoriously difficult to find and to distinguish from one another, and it is said that one caving group has "rediscovered" this cave no less than twice.

---

\* A map of the area will be found in *Proceedings*, 1956, Vol. 7, (3), Pl. 6.

In 1956 Shaw published a preliminary account of the work which he and the R.A.F.C.P.G. did at Faunarooska in 1952. They surveyed the wet and dry pitches and the main streamway from Faunarooska I Entrance down to the Second Cascades; they reckoned this was rather less than half the cave. In 1957 Shaw was with the U.B.S.S. party that completed almost the entire survey of the cave, leaving only the problem of the source of the main streamway. This was solved by the U.B.S.S. party in 1958, who found that the cave was fed by no less than six active swallets, five of whose waters turned and ran under the mountain to form the main streamway, instead of following the surface lines of drainage. A brief study of the cave morphology by Ollier (1956) was published in these *Proceedings*.

### ENTRANCE SERIES OF THE CAVE

#### Survey Plate 16

The Entrance Series comprises all the passages linking the six entrances. Of these, two are impassable (F.V and F.VI) but provided the water for the main streamway, one (F.III) cannot be followed to the main streamway but has been proved to connect, and the other three (F.I, F.II, and F.IV) lead to the main streamway. The Main Entrance (Faunarooska I) is the easiest and is the farthest downstream. It can be found by following the Townland Boundary from the green lane marked on the 6-in. O.S. map, and its co-ordinates are given at the beginning of this paper. The floor of this entrance is 16 ft. below moor level, the latter lying at about 880 ft. above I.O.D., and is found at the bottom of a swallet depression (39 ft. × 27 ft.). Like F.II and F.III this one is some yards inside the shale-limestone boundary, in an inlier exposed in the depression. Farther north the mountain slope is rather steeper and F.IV, F.V and F.VI lie at the junction of shale and limestone. In each case, a small stream issues from the peat and sinks in the entrance trickling partly through and partly over a slope of loose and saturated peat. In the case of F.IV, F.V and F.VI the water then follows mostly bedding plane passages in a roughly south-easterly direction, which gradually enlarge by down-cutting as the main streamway is approached.

F.II and F.III also have little overflows over the peat in their swallet floors, which pass in the same direction (south-easterly) by means of the same bedding plane to reach the main streamway. This bedding plane lies only a few feet under the shale-limestone unconformity and dips gently to the south. These overflow streams have been proved by colour tests. The main passages, however, from F.I and F.II descend rapidly to join the main streamway. At each entrance vertical fluting on the rocks is well marked. Faunarooska III Entrance is exceptional as the cave passage turns north-west, is joined by a low bedding plane passage (possibly from close to the surface at F.IV) and then turns south-west, where after 263 ft. it becomes too narrow for comfort.

Colour tests prove that it connects with the north branch passage which is met in the main streamway 132 ft. downstream from the Main (F.I) Entrance. This branch passage, when followed up from the main streamway, becomes too narrow to pass after 72 ft. Faunarooska IV Entrance was first entered by Brindle (1952) by mistake. The stream cuts down from its initial bedding plane gradually for 175 ft. until the main streamway is met. From here the main streamway was first followed upstream by the U.B.S.S. in 1956 to the point (section A A') where the 1957 survey was commenced. The low bedding plane passages from F.V and F.VI which join here can each be followed for about 200 ft. but eventually become impassable. The sections of the main streamway on the survey show the way in which the vadose stream passage has been cut down from its initially wide bedding plane. At D D' one has to travel in the roof, dropping to stream level again just before meeting the passage from F.IV. It is quite easy to miss this junction, because the upper part is only a vertical slit and the wider part enters quite low down.

At a point 46 ft. below the junction with F.II there is a narrow squeeze at stream level in the main stream passage, which is generally enough to turn one back. It is not unusual, when coming out of the main cave, to miss the turning to F.I and not to realize one's mistake until one reaches this squeeze (marked in survey). Bartlett did this in 1936 and our parties did it more than once. The passage from Faunarooska I Entrance is the only one that enters the main stream passage from the left-hand side. There is one small entrance a little way downstream from this, marked in the survey as "Hole to surface". The walls of the main passage here are marked with vertical fluting, showing that water enters from time to time. The normal passage height here is about 20 ft. and this very narrow slot leads up to daylight. Balcombe came out this way in 1937. He called it "Head Pot". This entrance was identified on the surface by the R.A.F.C.P.G. in 1952 as a cylindrical rock funnel at the bottom of a shallow depression. The next day, after heavy showers, it was taking water.

Balcombe's "Botair Faunarooska" (1937) is a misnomer, for it can only be a feeder of Polballiny. In any case there is no possible tributary entering Faunarooska on the south side. His description of it as being a group of shake-holes found on continuing northwards from Polballiny No. 1 sounds as if he means the two open holes 25 yards south of F.I. These two holes are connected underground by a low bedding cave, which continues south as a very low crawl taking water. It was explored for a short distance in 1952 when there were 9 in. of headroom above the water. Brindle (1952) misapplies the name Botair Faunarooska to F.IV.

It appears at first remarkable that as many as five out of the six swallets should feed the main streamway by burrowing back into the mountain. The

Entrance Series all lies beneath the shale and at section A A' is 280 ft. within the shale-limestone boundary. Yet this is the usual arrangement in Co. Clare, when a cave arises on a northerly slope of a hill, because the water tends to follow the dip of the rock back into the hill. A similar arrangement is seen in the feeding of the Long and Short Galleries of Pollnagollum.

#### THE MAIN CAVE (VADOSE PART)

For its first 2465 ft. from the Main Entrance the cave is a narrow, winding, predominantly vadose stream passage, averaging 2 ft. in width, with a height of from 15 to 30 ft., except where blocked by stalagmite, descending to a depth of 154 ft. below the Main Entrance floor. At this point, which is marked on the survey, the cave is only about 74 ft. below the surface. Most of this vadose part of the cave trends in a westerly direction, but at about section L L' the trend becomes northerly, and from section O O' it deviates only slightly from the line of the 800 ft. contour. This is a pity, because if it had continued on its westerly career it would soon have run out of hill, and we should have had a resurgence. As it is we have no indication whatever of what becomes of the Faunarooska waters; it is presumed that they emerge under the sea. The passage twists and turns violently, sometimes doubling back on itself. Stalactite curtains are common impediments, though between sections N N' and O O' the formations are very beautiful (*Plate 14*).

Between sections I I' and J J' are a number of well marked chert ledges, some of which are continuous, so that they form a bridge across the passage. The most conspicuous of these is at J J' and stands 4 ft. above the streamway. Another one just beyond is 10 ft. above. At the First and Second Cascades the water descends rather more rapidly down a succession of little pot holes. Between sections M M' and N N' is a 12 in. band of giant Productid fossils overlying some fossil corals.

Although there is some meandering, many of the zig-zaggings of the passage are short straight stretches aligned along the main joints. Some of the corners are still moderately sharp, while at others the stream has cut outwards to form slip-off slopes. The present height of the stream passage is not necessarily an indication of age, for the steep gradient of the cave is resulting in a rapid cutting down of the stream bed. There are some indications that the water flow is now less than formerly. Much of the vadose passage is marked by coarse, asymmetrical scallops. However in the main streamway between F.I and F.II the coarse scalloping exists up to a level 5 ft. above the stream, and above this is fine scalloping from drips, sometimes superimposed on the coarse markings. This suggests that for a long time the water has not risen more than 5 ft. in flood. Another point is that in much of the passage the lowest part of the section is the narrowest.

## THE MAIN CAVE (PHREATIC PART)

At a depth of 154 ft. below F.I Entrance an abrupt and surprising change takes place in the character of the cave. After a small waterfall and a turn to the right it becomes more like a tunnel (*see* section P P') and the large symmetrical scallop marks on walls and roof indicate that it is largely phreatic in character. At a point 172 ft. below the entrance level the water all leaves this phreatic passage, disappearing down a narrow crack to the right (not shown in survey). There is an accessible way down some 10 feet further back, where a drop of 10 ft. brings one again to the stream. This is the Wet Pitch Section. It begins with a drop of 21 ft. followed in quick succession by drops of 18, 31, 38, and 18 ft. The last three are almost vertical rift pitches, partly divided by thin flakes of rock. The most remarkable of these is in the final pitch. This 18-ft. pit is divided longitudinally by a huge leaf of razor-edged rock, rectangular, 10 ft. wide by 15 ft. deep, with the water falling down its eastern side. It is completely free on three sides, for the lower edge is some 4 feet from the floor. It hangs just like the leaf of a book and when struck produces a melancholy booming sound. The sump at the bottom is quite impassable, unless it widens at a considerable depth. There is a low air space (5 in. wide when seen under dry conditions) which does not appear to enlarge. The Wet Pitch Section is predominantly vadose in character, but it lies below and separate from the phreatic tunnel.

Beyond the start of the Wet Pitch Series is the Dry Series, noted for its mud and moon-milk. At section Q Q' the main passage is almost blocked by a broad dome of white moon-milk, probably deposited over fallen boulders. The top is nearly level, with a clearance of only a foot or so beneath the roof. It is most easily passed by taking a narrow opening on the left, floored with a glutinous mud derived from the moon-milk.

Just beyond here near the north-east corner of the chamber is some dark calcite deposit over mud. Since deposition occurred some of the underlying mud has been removed, either by slumping or being washed away, and lumpy, pancake-like plates of calcite, sometimes enclosing mud globules, remain undermined and attached along one side.

At section R R' begins the Roof Traverse, the lowest part of the tall cleft being too narrow to pass. One climbs along broad ledges as far as U U', where one descends 23 ft. to the floor again. At V V' the floor mud is 4 ft. deep, but beyond can be seen some beautiful formations (*see* Plate 15). The branch passage to the right beyond this opens into a high rift (section Z Z') partly filled with deep water, but it is blocked by a stalagmite curtain. The main way on continues to a 74-ft. pitch, the Dry Pitch. The ladder here hangs comfortably a few inches from the wall for the whole descent. The wall is coated with moon-milk, which seems to have a deadening effect on sound, reducing echoes to a minimum. As a result conversation between those at the

top of the pitch and those at the bottom is audible without need to raise the voice. 124 ft. from the Dry Pitch Chamber the passage comes to an end in a sump. Under normal conditions there is no flow of water down this passage, only a number of muddy-bottomed pools held back by gours of soft calcite. The sump is likewise floored with soft mud, at least knee deep, and it shows no sign of closing or lifting within 5 ft. (i.e., as far as can be reached by lying in it and kicking).

The part of the cave which lies beyond the point 154 ft. below F.I Entrance has been called the "phreatic part", not because it is entirely phreatic, but because that is its dominant characteristic. The stream probably originally flowed northwards along its whole extent, before finding an easier way down the Wet Pitch Series, but beyond R R' there has been subsequent vadose modification.

### FILLS

A number of silt and gravel deposits are exposed, particularly in the phreatic part of the cave. At a point 25 ft. before the Wet Pitch is reached the following succession was noted:

1. The lowest 4 ft.: Dark brown silt, no stones.
2. The next 1 ft.: Soft white stalagmite.
3. The next 4 ft.: Gravel, silt, pebbles and rounded stones.
4. The top 4 ft.: Yellowish brown silt, no stones, with current bedding, extending right up to the roof.

This pebbly stone fill is seen in other parts of the same passage and also near section L L' in the vadose part of the cave.

There is a similar fill in the branch passage to the right, just short of the Roof Traverse. A stream (dry when examined) has cut a vertical section through this, showing the following succession:

1. The lowest 2 ft.: Dark brown sand and shale fragments.
2. The next 1½ in.: Light khaki silt, more like clay.
3. The next ½ in.: Sand.
4. The top 3 to 6 in.: Stratified brown, very fine sand-clay bands, at least seven, showing distinct current bedding.

This tributary stream appears to be very recent, as the silt filling is being undercut and removed quite rapidly.

This seems to correspond with the upper layers of the fill first described, but exact correlation has not been worked out.

Another section of fill was found in the left-hand wall of the Roof Traverse, consisting of 2 ft. of dark brown, very fine sandy silt with some shale fragments—quite damp. It was obviously the remnant of an infilling and not flood débris on a ledge. Overlying it was a 1-in. pan of hard, light-coloured, sandy material.

### THE HISTORY OF FORMATION OF THE CAVE

A theory for the history of this cave must take into account the sudden change in character from the narrow, winding, vadose stream passage to the broad passages of phreatic origin, which it meets at a depth of 154 ft. below the entrance. It must explain the fills, some of which are being rapidly washed away, and it should account for the peculiar direction which the cave takes.

To take the last point first. Most of the caves in Co. Clare follow the gentle dip of the limestone and enlarge along the major joints, which run a little west of south on a bearing of  $196^{\circ}$ ; to a lesser extent they follow the minor joints, which lie on a bearing of  $270^{\circ}$ . Polballiny, for example, which is the next large system south of Faunarooska, follows for the most part the major joints and runs more or less south-west, keeping close under the surface all the way. Faunarooska does the same in its entrance series, but the Main Cave is dominated by the minor jointing, which takes it in a westerly direction throughout its vadose course, and in doing so it sinks to a greater depth below surface than any of the neighbouring caves. The phreatic passages follow the major jointing, it is true, but in a direction opposite to the dip of the bedding. This domination of the vadose part of the main cave by the minor jointing appears paradoxical. In fact, a great deal of the cave passage is carved out along the major joints, so that its windings are greatly exaggerated and it takes longer to reach its destination. But the minor jointing prevails, in so far as it ensures that the general trend is westerly, towards the phreatic passages.

These phreatic passages must have been formed first, at a time when the water table was very much higher than now. Their average depth is 170 ft. below the Main Entrance, which makes them about 710 ft. above sea level. It is possible that the water table remained steady for a very long period just above the level of the very large passages. If so, similar systems may exist beneath other caves on the west side of Slieve Elva, but they have remained undiscovered because no other cave has been explored to a comparable depth. It would seem that when the water table eventually sank and these phreatic passages became air-filled, they provided the most attractive or convenient outlet for the waters reaching them along all the enlarged bedding plane channels, which had already formed. These were the roofs of the T-shaped stream passages. They enlarged by vadose development along the minor joints to a greater extent than is usual, because it was these that were directed towards the previously formed phreatic passages. This accounts both for the direction taken by the vadose stream passage and for its steep descent; it had to descend steeply to reach the drainage system already present.

At some stage after this much of the cave was choked by the laminated material found in the fills. One cannot say how ancient any of this is. Part

of it lies underneath stalagmite layers and could (but need not necessarily) be glacial drift. Other fills include shale pebbles, small stones and silt washed in, the finer materials being deposited last in the deeper parts of the cave, when the flow became slowest. In a sluggish stream silt can rapidly be deposited to a great depth, and the slower the stream the finer the silt. Eventually the entrances became unblocked, and once the water started to flow again clearance was rapid.

## TABLE OF DISTANCES

Passages comprising Entrance Series .. .. .	1901 ft.
Main Cave (Vadose Part) .. .. .	2439 "
Main Cave (Phreatic Part) .. .. .	1079 "
Wet Pitch Section .. .. .	124 "
Total length .. .. .	<u>5543 ft.</u>

Distance from Faunarooska I Entrance to head of Wet Pitch .. .. . 2710 ft.

Distance from Faunarooska I Entrance to end of cave .. 3451 "

Position of sump below 54 ft. pitch in relation to Faunarooska I Entrance is 1176 ft. on a true bearing of  $324^{\circ}$ .

## THE DEEPEST CAVE IN IRELAND

Pollnagollum .. .. .	330 ft. deep
Faunarooska .. .. .	308 " "
Dragonfly Pot, Co. Sligo .. .. .	296 " "
Carrowmore Cave, Co. Sligo .. .. .	255 " "
Noon's Hole .. .. .	250 " "

## NOTES ON THE SURVEYING

The instruments used were a hand-bearing compass and a metal-reinforced linen tape, read to accuracies of  $1^{\circ}$  and 6 in. respectively. Passage widths were measured in 1952 and estimated in 1957; roof heights were estimated throughout. Depth was measured by using a clinometer in the dry section and parts of the stream passage and by measuring the falls of water directly in other parts.

The overland survey was done by means of a hand-bearing compass in some places and by a prismatic, liquid-filled army compass in others. Distances between Faunarooska I and Faunarooska IV entrances were measured by linen tape, the other distances and the positions of the walls in relation to Faunarooska IV to Faunarooska VI entrances were paced, and then checked back on to the 6 in. to 1 mile O.S. map, with a fair degree of accuracy.

## NOTES ON THE PLOTTING

The magnetic variation was taken as  $15^{\circ}$  W. in 1952 and  $14\frac{1}{2}^{\circ}$  W. in 1957.

The final working plan was drawn out at a scale of 40 ft. to 1 in., with cross sections at 10 ft. to 1 in. The co-ordinates of every survey point (except for those in Faunarooska IV streamway) were calculated to the nearest 0.1 ft. and plotted on to squared paper.

The traverse between the entrances of Faunarooska I and Faunarooska II was closed on the surface and the misclosure allocated equally to the two surveys. The error was then distributed evenly by multiplying the co-ordinates of each intermediate point by the factor necessary to bring the second entrance to its correct position. (The co-ordinates of the Faunarooska Entrance were 0, 0.) The traverse between the entrances of Faunarooska I and Faunarooska IV was not closed. The plotted misclosure was 16 ft. (about 2 per cent) and on the survey this has all been put down to the surface measurements.



A photographic reduction of the working plan was retraced for this publication and then further reduced. Many cross sections had to be omitted. The widths of the cave passages where they are narrow have been exaggerated up to 50 per cent on the plan, but where they are broad they are accurately represented. The widths, therefore, should be taken from the cross sections, which are all accurate.

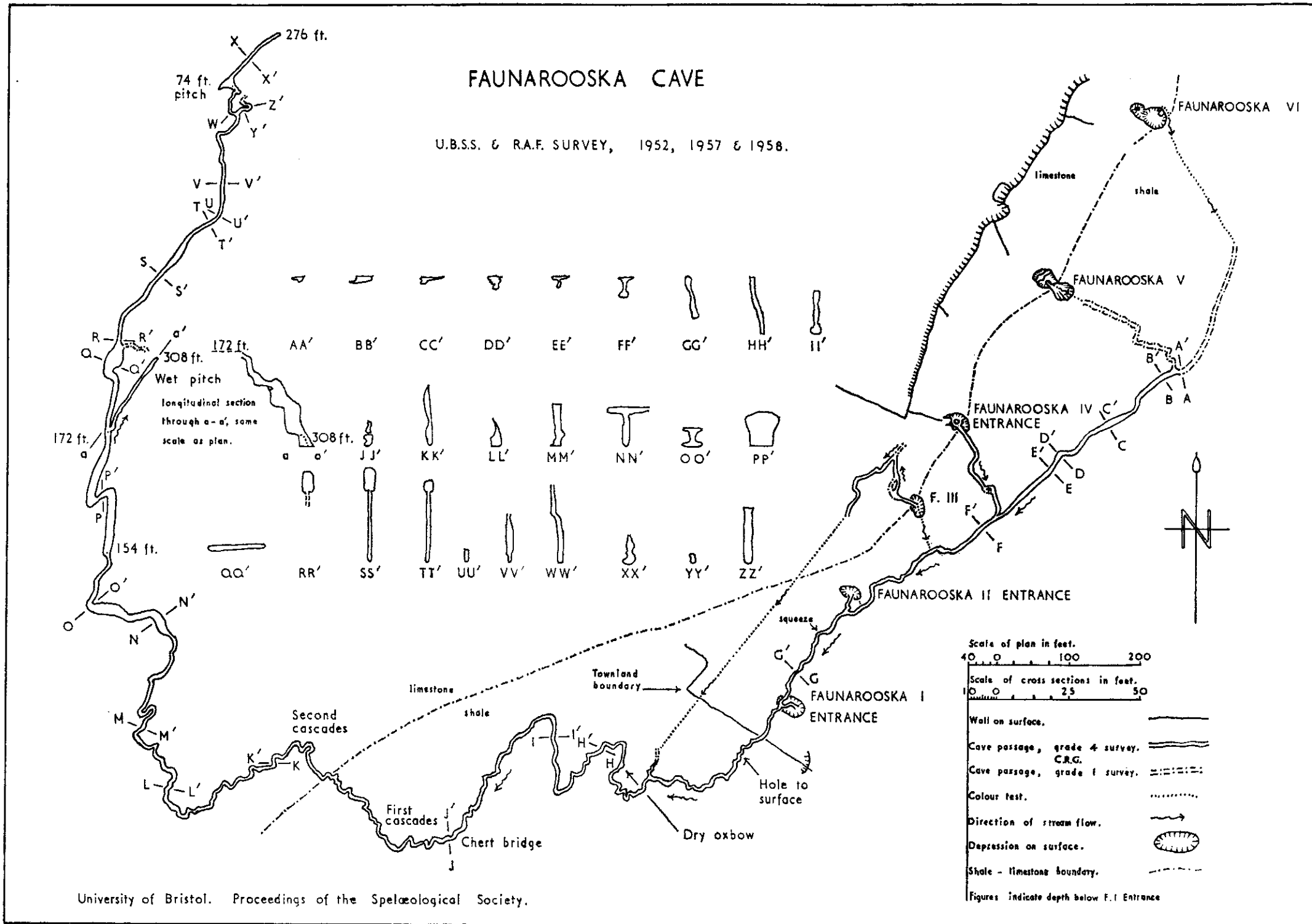
## BIBLIOGRAPHY

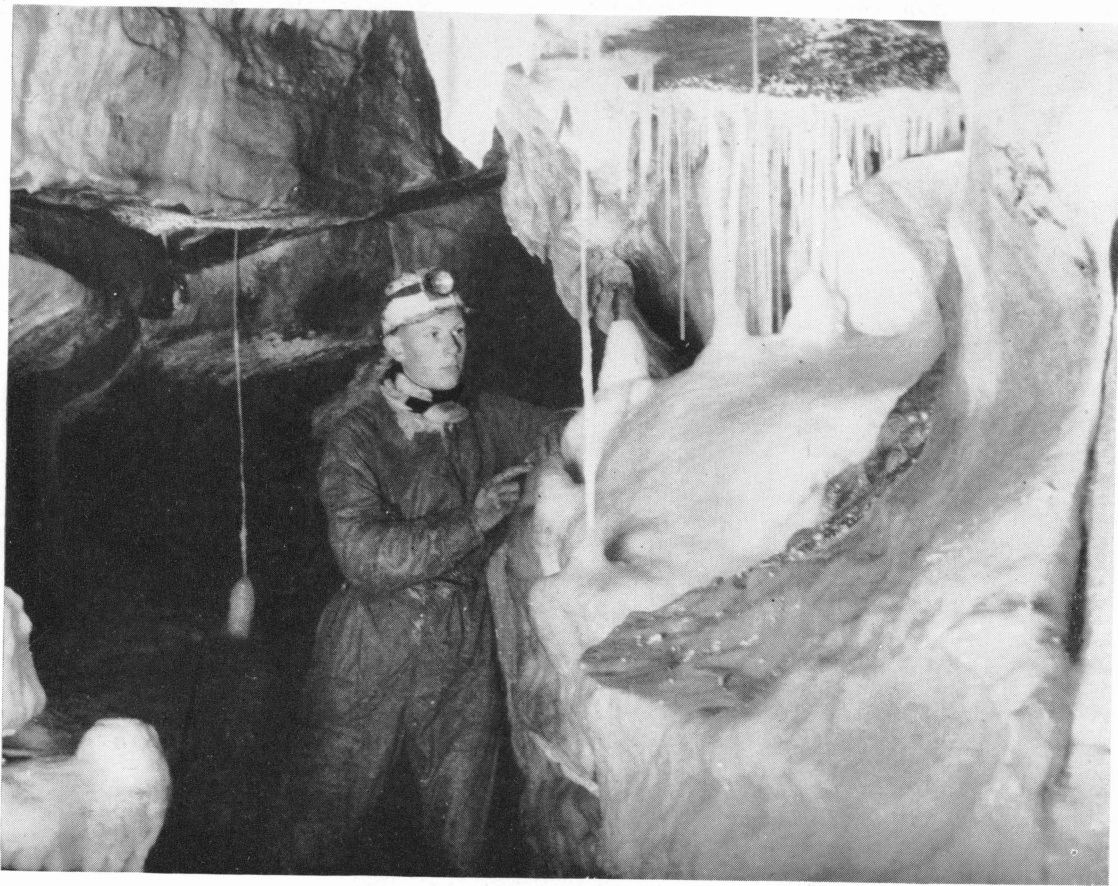
(*Proc.* = *Proceedings, University of Bristol Speleological Society*)

- BALCOMBE, F. G., 1936, *Ireland 1936*, privately printed, 4, 10-12.  
 — — 1937, *Ireland 1937*, privately printed, 5, 8, 9, 10.  
 BARTLETT, P. N., 1937, *Caves and Caving*, Vol. 1, No. 1, 39.  
 — — 1938, "Three Easters in Ireland", *York. Rambl. Club Jour.*, Vol. 7, No. 23, 39-41.  
 BRINDLE, D., 1952, "Botair Faunarooska and Ballyelly Pollapooka", *Jour. Craven Pothole Club*, Vol. 1, No. 4, 182-183.  
 — — 1952, "Faunarooska", *Jour. Craven Pothole Club*, Vol. 1, No. 4, 183.  
 [LLOYD, O. C.], 1957, *Wessex Cave Club Jour.*, Vol. 4, No. 64, 269.  
 — — 1958, *Cave Research Group News Letter*, Nos. 72-77, 8.  
 OLLIER, C. D., 1956, "Faunarooska", *Proc.*, Vol. 7, No. 3, 181-182.  
 — — and TRATMAN, E. K., 1956, "The Geomorphology of the Caves of North-west Clare, Ireland", *Proc.*, Vol. 7, No. 3, 138-158.  
 PICK, S. J., and BARTLETT, P. N., 1936, "Cave Explorations in Clare", *Irish Nat. Jour.*, 64-68.  
 SHAW, T. R., 1952, *The [Nat. Spel. Soc.] News*, Vol. 10, No. 11, 7.  
 — — 1956, "Explorations in Co. Clare, 1952", *Cave Science*, Vol. 4, No. 26, 92.  
 — — 1956, "Recorditis", *The Speleologist*, No. 4, 180.  
 — — 1957, *Cave Science*, Vol. 4, No. 28, 204.  
 — — 1957, *The [Nat. Spel. Soc.] News*, Vol. 15, No. 11, 122.  
 — — 1958, *The British Caver*, Vol. 29, 14.  
 — — 1958, *The British Caver*, Vol. 30, 25.  
 SIMPSON, E., 1952, *Bull. Brit. Spel. Assoc.*, No. 32, 1.  
 WARWICK, G. T., 1953, in *British Caving*, 119.  
 ANON., 1938, *York. Rambl. Club Jour.*, Vol. 7, No. 23, 80.  
 ANON., 1957, *York. Rambl. Club Jour.*, Vol. 8, No. 28, 195.

# FAUNAROOSKA CAVE

U.B.S.S. & R.A.F. SURVEY, 1952, 1957 & 1958.

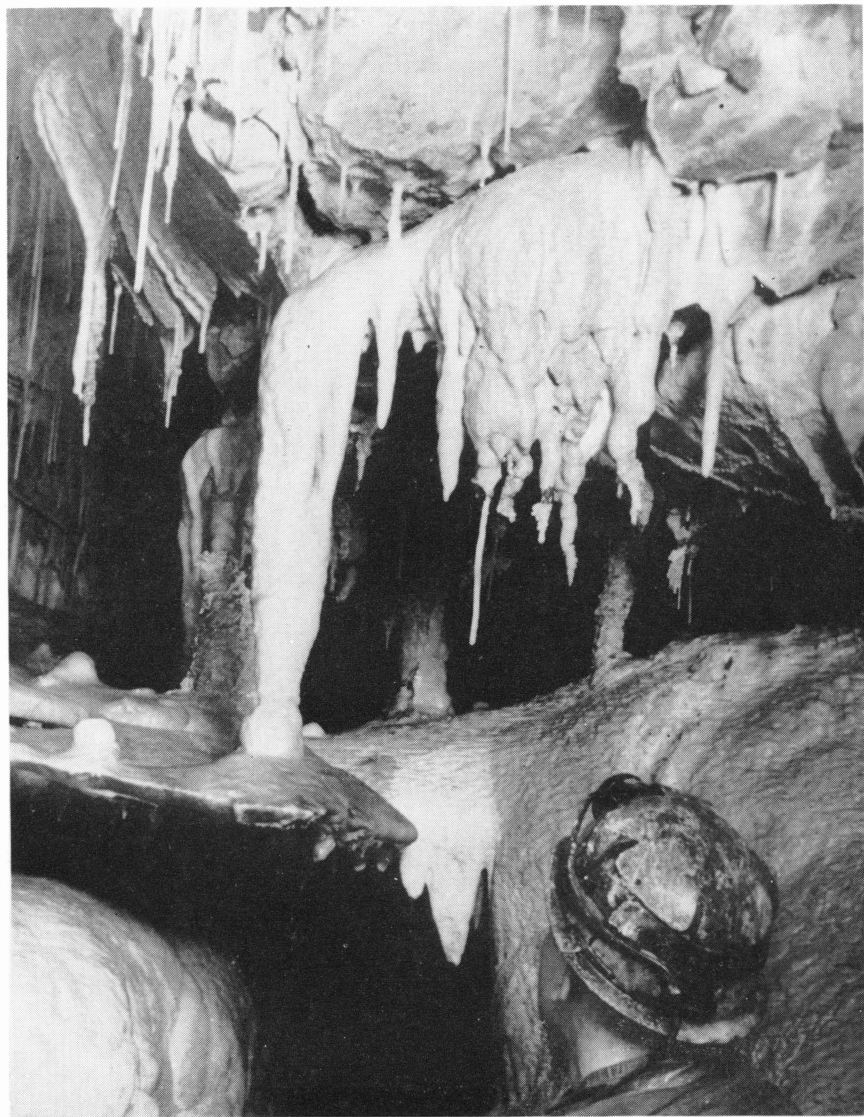




*(Photo: T. R. Shaw, 1952.)*

**PLATE 14**

Faunarooska Cave: formations in stream passage between Sections N N' and O O'.



*(Photo: T. R. Shaw, 1952.)*

**PLATE 15**

Faunarooska Cave: dry phreatic passage beyond Section V V'.