

## The Fergus River Cave, Co. Clare, Ireland

By

D. J. PATMORE and F. H. NICHOLSON

(Other names: Ballycasheen Cave, Poll-na-Cloch-Greanta)

(Entrance: O.S. 6 in. to 1 mile, Clare Sheet 16, E. 33·8 in., N. 17·8 in.,  
Td. Roughaun. Total length: 1881 ft. Tackle required: None)

### INTRODUCTION

The Fergus River originates in Lough Fergus. It takes a complicated route across beds above the carboniferous limestone and has eventually cut for itself a deep valley through the Clare Shales on to the limestone at E. 27·5 in. N. 15·2 in. (Td. Cahermacon). Here there are several low waterfalls, the topmost being the top of the limestone, which is a very thin bed with a 4 in. thick bed of shale beneath it. The water runs a short distance over the limestone and then disappears over a considerable area amongst limestone boulders. Above the level of the floor of the swallet the valley continues but never, apparently, gets flooded. After half a mile the surface gradient takes the valley floor down to the level of the river which rises at Poul naboe, and continues as a permanent surface river, meandering for several miles in a flat-bottomed valley in a generally easterly direction before it enters Lough Inchiquin.

Along this stretch the river receives a number of major tributaries running in from the north where there is nothing but limestone with a covering of boulder clay in places, particularly in the valley floors. The first major tributary comes in as a wide flat-bottomed valley. The water rises in the floor of this valley and from the sides. The points of rising progress further and further upstream as rainfall increases until very considerable volumes can be seen to pour out of numerous low bedding plane passages, which measure a few inches in height, at the foot of the low limestone bluffs which here form the valley side especially on the west.

The valley begins to narrow and to divide into east and west branches, the former being the better developed. Both soon peter out in the steeply rising ground to the north and the last main rising is close to the central bluff between the two heads. The cave entrance is at the foot of this bluff in the eastern branch and is marked by a small gully filled in with moss-covered boulders. The entrance is a higher level rising now abandoned. It has never been seen by any U.B.S.S. party to be active nor is there any evidence that it is ever so now. But a little way inside the entrance a route down to the left, west, leads to a low bedding plane passage, which, from the mud deposits

in it and their arrangement, may possibly take water under flood conditions. There are also numerous intermittent pools at various places in the cave, these pools being capable of drying up in the course of a few days, and are probably filled by water seepages through the roof. The general direction of the cave is parallel to the regional drainage direction so well shown on Sheet 14 of the O.S.  $\frac{1}{2}$  in. to 1 mile map of the area (Galway and the Aran Islands).

The first recorded exploration of the cave took place in 1937 when Bartlett *et al.* (1937, 1938) reported the discovery of about the first 500 ft., and they named it Ballycasheen Cave after the neighbouring townland.\* This length represents less than one-third of the total length known today, 1881 ft. Their exploration apparently terminated at "The Nick", a small and none-too-obvious hole in the roof which gives access to the final two-thirds of the cave.

The entrance was found anew by the U.B.S.S. on a quick reconnaissance of the area in 1957, but the cave was not entered. Nor was it known at that time that it had been found earlier by the Yorkshire Ramblers Club. It was on this reconnaissance that the cave was called the Fergus River Cave.

The next examination of the cave took place in 1960 when members of the Craven Pothole Club explored and surveyed the cave to C.R.G. grade 2-3 (Batty, 1960). They more than trebled the known length of cave by their discovery of "The Nick" which gave access to a further 1200 ft. of passage, although at the time the initial exploration of 1937 was unknown to them. They gave it the name of Poll-na-Cloch-Greanta after the double-headed Celtic god statue which stands close to the roadside about 100 yd. north of the cave.

This cave was examined and resurveyed to C.R.G. grade 4-5 by the U.B.S.S. in 1962-63. Another 100 ft. was added to the cave by the discovery of the White Aven. In the rest of this account the name Fergus River Cave† will be used as it describes the cave's relationship to the river.

## DESCRIPTION OF THE CAVE

The cave is described looking "upstream" that is away from the entrance as the cave is an abandoned rising. The mouth of the cave is hidden by a growth of thorny trees and bushes, and is situated at the foot of a 12-ft. high limestone bluff at the head of a small gully filled with boulders. The entrance passage is a rift, 5 ft. high and 2 ft. wide and 30 ft. long. The mouth is partly blocked by a pile of boulders. A crawl over these gives access to the cave. About two-thirds of the way along this rift is a hole at the foot of the

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\* The entrance is actually in Td. Roughaun.

† Williams (1964) has called it Roughaun cave after the townland in which the entrance lies.

right-hand wall which gives access to a bedding chamber, about 15 ft. wide and 30 ft. long and 1-2 ft. high. The floor is really the top of several large blocks which have fallen from the roof (Section 2), a feature which is fairly common in this cave. The northern end of the chamber develops into a canyon passage (Section 3) between 4 and 5 ft. high and 2-3 ft. wide along which many chert nodules suspended from roof pendants are to be found. These consist of pendants of limestone about 6 in. long from the roof and on the ends of these are nodules of chert. These have apparently been formed by the development of anastomosing channels in the roof up through a layer of chert, which being far more resistant to solution has dissolved much more slowly than limestone and has thus protected the limestone behind it from solution.

After 70 ft. the passage develops into a chamber, 15 ft. long and 10 ft. wide and 2 ft. high, and the way on is up a 2-ft. step and down through a small hole at the other side of the chamber. The way continues as a bedding passage, 2.5 ft. high and 15 ft. wide (Section 5), and about here is sometimes found a shallow pool, which has been known to dry up completely in the course of a few days. It is probably filled by water percolating through the roof. There is abundant chert in the roof, and the floor consists of pebbles and boulders cemented in place with soft calcite, which is commonly found along this cave.

The passage continues in this form for about 30 ft., the height gradually drops to about 1 ft. and then it opens out into a chamber, 5 ft. high, 15 ft. long and 10 ft. wide, decorated with flowstone formations. The continuation is on the opposite side of the chamber at floor level through a bedding plane passage, 8 ft. wide by 2 ft. high (Section 6), with occasional chert pendants from the roof and cemented pebbles on the floor. After 20 ft. another small chamber, 20 ft. long, 6 ft. wide and 6 ft. high, is encountered. The passage continues to the left where it is unfortunately necessary to climb along some very fine white flowstone cascades in order to gain access to the rest of the cave. For the next 20 ft. the whole passage is covered with really impressive white flowstone formations including columns and curtains (Section 7).

Again the passage develops into a bedding one, about 15 ft. wide and 4 ft. high, with half-tubes in the roof and pebbles and cobbles and boulders on the floor. This slowly drops and the passage opens into a chamber, 15 ft. high and 20 ft. wide, with a pool in the centre and with some flowstone formations. There is no obvious way on from here, but near the far end, where the chamber tapers down to 4 ft. high, is to be found a small hole in the roof about 6 ft. from the left-hand wall. This hole is at the edge of a block of limestone, which has slipped down 1 ft. (Section 12), and was called "The Nick" by the C.P.C. After a bit of a squeeze one is through to a bedding chamber, only 1 ft. high but 20 ft. wide and 30 ft. long. At the end

of the chamber the floor drops by about 3 ft., and it can be seen that the floor is in fact the top of a large block which has fallen from the roof.

The passage now turns to the left and develops into another bedding passage, about 4 ft. high and 10 ft. wide, with a chert band on the floor. At the beginning of this chamber there is a step up of the floor of 1 ft. and it would appear that the floor is the top of another fallen block. After about 40 ft. the passage opens out into a chamber, 20 ft. long, 15 ft. wide and 20 ft. high, with mud slopes on either side. On the top of a mud bank near the end of the chamber on the right is a group of mud stalagmites, numbering about 12 in all and averaging 4 in. in height. On the left wall is a layer of white flowstone deposited from a trickle entering at roof level, 20 ft. up.

The way on is through a hole 2 ft. high at the foot of the far wall of the chamber and a little to the right of the centre. This gives access to a bedding plane passage, 15 ft. wide and 2 ft. high (Section 15). The floor is composed of fairly compact mud, and a chert band forms the roof. After about 50 ft. the passage makes a 90° bend to the right, and at this point boulders with scallop markings indicating flow direction towards the entrance were noted. Here the passage narrows to 1 ft. and the height is 6 ft. (Section 17).

After 40 ft. there is a chamber, 25 ft. × 15 ft. × 4 ft. high, which is well decorated with gour pools and has a large pool about 1 ft. deep on the left. The roof at this point is stained black in parts (probably  $MnO_2$ ). The route continues through a small hole at floor level in the left corner of the far wall beyond the pool. The passage ascends steeply for 4 ft., levels out and makes a 90° bend to the right, and after 6 ft. another to the left. Here the passage boasts a profusion of gour pools and stalagmites; much of these calcite formations especially those on the floor look dead and are possibly being redissolved. At the second 90° bend there is an interesting group of 3 stalagmites known as "The Skittles" (Section 20; *Plate 14*).

Another 40 ft. on the passage loses its formations and there is much mud on the floor and walls. The floor has many boulders on it. On the left (Section 26) there is a large boulder evidently fallen from the roof. Part of the boulder is covered with mud and here a small group of mud stalagmites was found. A short distance further on the passage drops in height to about 3 ft., then, after skirting round several large gour pools, the route leads into Shingle Cavern. This is a large and impressive chamber (Section 31), 100 ft. long, 20 ft. wide and 40 ft. high. Piled up against the left wall is a mud bank some 10 ft. high and extending across two-thirds of the floor. Along the edge of this mud bank are a number of well-formed mud stalagmites (*Plate 15*). This chamber also boasts some fine gour pools. At the far end the mud bank peters out and the sloping floor is covered with clean shingle washed by water trickling down the walls. This shingle consists mainly of limestone, but also contains some granite and other erratic material. At the

far end of the chamber there is a layer of calcite which appears to be spreading over the shingle; there are small patches of mud on this flowstone and these seem to be the remnants of a much more extensive layer now largely removed. At about this position there appears to be a high-level passage leading off to the left at the roof. This has not been explored owing to its inaccessibility.

The passage continues at floor level under a low arch 2.5 ft. high on the right side opposite the shingle bank. Here there are several large and almost invisible pools of water 2-3 ft. deep which require careful circumnavigation to avoid a wetting (*Plate 16*). These pools have been known to dry up on occasions. The passage leads round a large mound of mud and into the final section of the cave which seems to be covered entirely by a layer of mud. At the beginning of this section on the right, under a 2-ft. high arch at floor level there is a branch passage which continues for about 100 ft., when it becomes too low to follow any further. The passage is floored with mud 6 in. to 2 ft. deep overlying well-rounded cobbles. About 60 ft. along this passage on the right is a smaller one 2 ft. wide which can be followed for 10 ft. after which progress is barred by a fallen block. A possible continuation of it could be seen over the top of this block.\* It would need explosives to break up the block as the constricted nature of the passage makes it impossible to use a lump hammer to do the breaking.

About 50 ft. up the main cave is another branch passage leading off to the right. It consists initially of a wide bedding plane about 1 ft. high. The floor drops vertically 6.75 ft. on to a bank of shingle which is quite clean despite the muddy nature of the surrounding walls and roof. This would imply that a small flow of clean water takes, or has taken, place. A very small trickle would be sufficient. The floor begins to slope upwards so that after 50 ft. the passage is too small to follow. On either side along this length the bedding plane is mud-filled to the roof. Half-way along on the right there is a passage cut through the mud as if by a small stream flowing away from the present passage. This might be made passable with some digging.

About 50 ft. further along the main passage it branches. The right branch is a bedding plane passage about 12 ft. wide but which becomes impassable after 60 ft. The left branch continues as a rather muddy crawl over a pile of boulders formed by roof collapse. The passage then turns right up a mud slope and develops into a large bedding chamber, 100 ft. long by 40 ft. wide and 4-6 ft. high, and is known as Block Chamber (Section 34). A large portion of the floor is covered with mud and boulders. The most remarkable feature is an enormous limestone block, 70 ft.  $\times$  15 ft.  $\times$  4 ft., which almost fills up the right side of the chamber and which has obviously

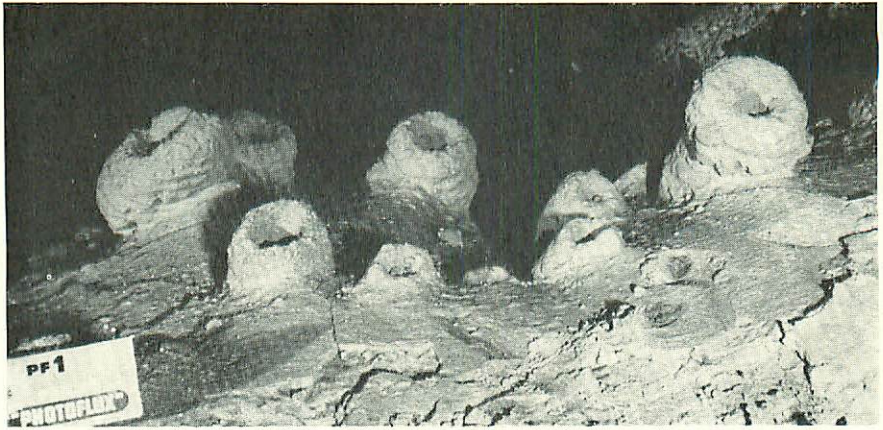
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\* See page 286 for the reasons why this might lead to a considerable extension.



*(Photograph: D. M. M. Thomson)*

**Plate 14**  
"The Skittles."



*(Photograph: D. M. M. Thomson)*

**Plate 15**  
Mud stalagmites.



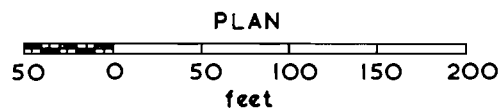
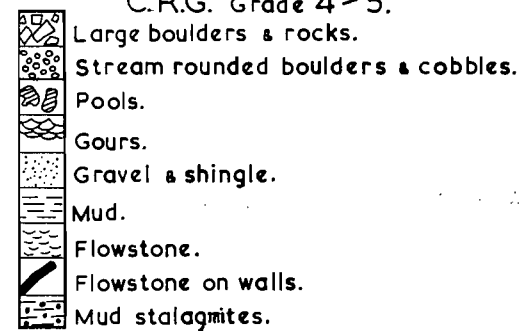
*(Photograph: D. Savage)*

**Plate 16**  
Pool beyond Shingle Cavern.

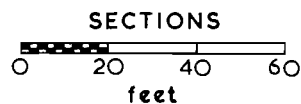
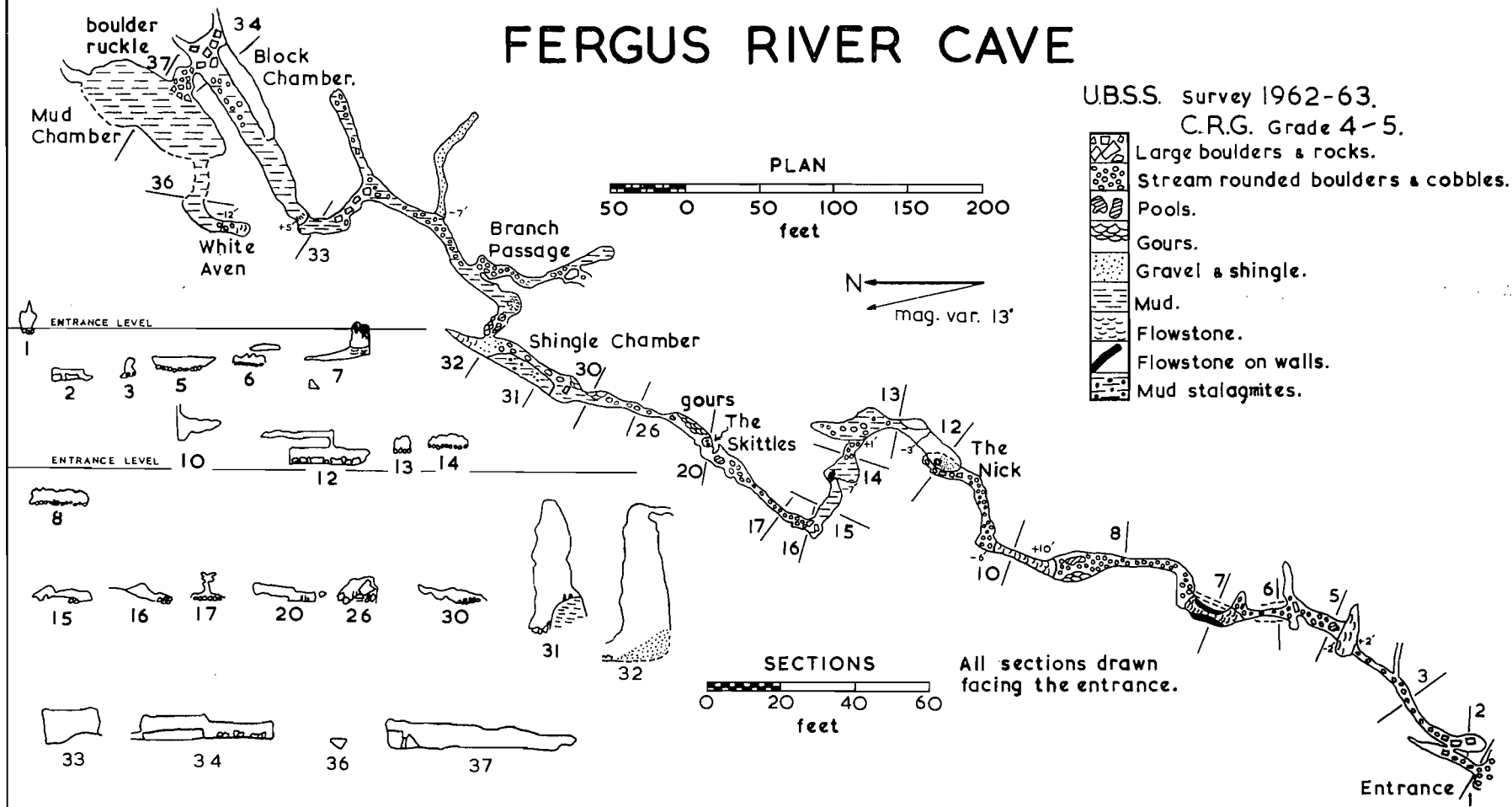
# FERGUS RIVER CAVE

UBSS. survey 1962-63.

C.R.G. Grade 4-5.



N  
mag. var. 13'



All sections drawn facing the entrance.

Entrance



fallen from the roof. The roof itself consists of similar-sized blocks, one of which has dropped some 6 in. relative to the others for almost the whole length of the chamber. The chamber is also floored with similar immense blocks, which have collapsed earlier than the block mentioned above.

Near the far end of the Block Chamber a low arch, about 1 ft. high, gives access, via a rather unstable boulder ruckle, to another large bedding chamber, 100 ft. long. It is 6 ft. high and is called Mud Chamber (Section 37). The entire floor of the chamber is covered with dried mud, with many small mud stalagmites. The mud floor contains abundant mollusca (see Appendix 1), but the few broken mud stalactites examined were formed of mud only. Nowhere can a solid rock floor be seen. At the southern end of the chamber the roof comes down to less than 1 ft. from the floor. A route was made by digging away some of the mud on the floor. This passage ended in a 30-ft. high aven, called the White Aven, because of a remarkably beautiful white flowstone covering the walls. The floor of the aven drops 12 ft. and is strewn with calcite-covered boulders. A small trickle of water enters at roof level and leaves through the boulder floor.

### THE SURVEY

(Plate 17)

This was carried out to C.R.G. grade 4-5 using a hand-bearing, liquid-filled prismatic compass reading to  $2^\circ$  and a steel-reinforced (metallic) tape read to the nearest inch and a clinometer reading to  $1^\circ$ . From Section 15 in Plate 17 onwards the clinometer was found to be useless and no opportunity was afforded for a return visit. All the sections shown in the survey have been drawn looking towards the entrance, that is downstream. A longitudinal section drawn out along an axis parallel to the main direction of the cave (*c.*  $12^\circ$ ) shows that, after the downward slope of the first 25 ft., there is a gradual rise up the cave. At "The Nick" the cave roof is about 10 ft. higher than at the entrance. Beyond there are several ups and downs and the roof of Mud Chamber is estimated as being about 25 ft. above the entrance roof level.

The survey was drawn out to a scale of 1 in. to 50 ft. from the computed figures, the computations having been carried out with an I.B.M. 1620 data-processing machine which the University of Bristol was kind enough to let us use. The reduction has been made photographically.

### GEOMORPHOLOGY

By

F. H. NICHOLSON

The Fergus River Cave is unlike all other caves in N.W. Clare explored and surveyed to date by U.B.S.S. except Poll-an-Ionain and possibly White Horse Cave, Kilcorney. There is little doubt that it is an old resurgence of

the tributary to the Fergus River, the entrance being 30 ft. above and 250 ft. horizontally from a major wet weather rising of the tributary. The overall slope of the cave is up from the entrance after the first 50 ft. but the profile is not smooth, there being a number of undulations, which seem too large to be attributed to collapse.

In its present state the cave might be described as fossil. Certainly from the entrance to Shingle Cavern the abundance of calcite formations testify to its fossil state. Possibly the absence of calcite formations, except in the White Aven, in the section beyond Shingle Cavern, may indicate that this part of the cave has been active or semi-active more recently than parts nearer the entrance. This idea is supported by the Branch Passage, just upstream from Shingle Cavern, having a downward slope (see survey). Cobbles on the floor of this indicate that it has taken a sizeable flow in the past. This might well have been the main streamway during the latter part of the cave's active history, the portion Shingle Cavern to Entrance being the earliest part to be abandoned.

The cave is of great morphological interest and deserves much more detailed study. At present it is only possible to point out some of its complexity. Pebbles of, presumably, glacially derived erratics up to 3-in. diameter are found through the cave. As a very rough estimate the erratics form between 0.5 and 5.0 per cent of the  $\frac{1}{4}$ -in. to 2-in. size range. The erratics are of various igneous types, plus some non-local sedimentary rocks (Appendix 2).\* The nearest source for the igneous rocks is in the Connemara mountains to the north-west.

In Block Chamber a number of phases were distinguished. These illuminate the complexity of the cave's development. The floor of the chamber is made up of two or three massive blocks which have fallen from the roof. The similar large blocks, some 70 ft. long, readily seen on the right-hand side of the chamber seem to be resting on an older fill. Upon the present floor are large cobbles, 18 in.  $\times$  9 in.  $\times$  4 in., and some even larger and these have been well rounded. To move and round the cobbles of this size needed a powerful stream and the chamber is 30-40 ft. wide and 4 ft. high. Even if the cobbles are glacially derived, being rounded earlier, a powerful stream would have been needed to move them to their present position. The surface that the cobbles lie on gives further evidence of a stream able to transport a heavy load. The upstream surfaces of minor undulations are well polished, almost certainly by abrasion by coarse material. Amongst the cobbles is some material of smaller size, including erratic material. The whole is covered with a film of mud. This is similar to the mud in Mud Chamber where it is 2 ft. thick in places and contains many

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\* The authors are very grateful to Dr. Leake for his report.

gastropods (Appendix 1).<sup>\*</sup> In this are developed mud stalagmites. Thus there must have been initial passage formation, then probably some infilling, followed by collapse of the roof to form the present floor of blocks. Then followed a fast-flowing stage with a considerable stream, which in its turn was followed by a quieter sand and mud deposition stage. The mud stalagmites of Mud Chamber may indicate that here at least this stage is over now.

Several stages of stalagmite formation can also be distinguished in the section from the entrance to Shingle Cavern, and this formation frequently overlies pebbles, mud and collapsed boulders. In Shingle Cavern a boss of stalagmite 4 ft. in diameter has been vigorously redissolved, exposing a section across its diameter. This has been since partially obscured by a further deposition of calcite. Despite its "dead" appearance the latest stage of calcite formation throughout the cave would appear to be one of deposition rather than redissolving, though the soft nature of much of the formations is worth reemphasizing.

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## APPENDIX 1

LIST OF NON-MARINE MOLLUSCA  
(Nomenclature according to Ellis, 1951)

By

R. B. G. WILLIAMS

(Department of Geography, University of Cambridge)

<i>Valvata cristata</i>	708 examples
<i>Valvata piscinalis</i>	25
<i>Bithynia tentaculata</i>	1 operculum
<i>Carychium</i> sp.	2
<i>Lymnaea peregra</i>	10
<i>Planorbis leucostoma</i>	56
<i>Planorbis crista</i>	7
<i>Planorbis contortus</i>	96
<i>Acroloxus lacustris</i>	194
<i>Ancylus fluviatilis</i>	377
<i>Lauria</i> sp.	2
<i>Discus rotundatus</i>	Fragments
<i>Pisidium personatum</i>	?48
<i>Pisidium ?hibernicum</i>	3
<i>Pisidium nitidum</i>	?17
TOTAL	1,546

The molluscan fauna indicates warm conditions similar to the present. *Acroloxus lacustris* is a southern species which in Europe reaches its furthest north in southern

<sup>\*</sup> The authors are very grateful to Mr. Williams for his report on these mollusca. He considers them, and therefore the mud, to be Atlantic in date (Zone VIIa).

Scandinavia. The remaining water species furnish no definite evidence as to temperatures, but the few land species present (*Carychium*, *Lauria* and *Discus* sp.) confirm that the climate was warm.

The mollusca are most likely to have lived in a gently moving river; it is improbable that they lived in a lake. The three main species vary somewhat in the conditions they prefer (Boycott, 1936). *Valvata cristata* lives in running water and likes plenty of mud and water plants. *Ancylus fluviatilis* prefers places with a quick current and a clear bottom. *Acroloxus lacustris* may live in the same river as *Ancylus*, but it inhabits stretches of quieter water where there is much submerged vegetation. All three can occur in lakes but they would scarcely be the dominant species. The fauna is definitely not that of a turlough, intermittently empty of water, such as Lough Aleenaun.

There are several peculiarities about the fauna, however, which make its interpretation difficult. In the first place, land species account for a remarkably small percentage of the total shells. In typical river mud, for instance that of the Fergus River today above Inchiquin Lough, land species account for 5 to 10 per cent of the total and are probably mostly picked up by the river in time of flood. A low percentage could mean that the deposit was laid by a river with a freedom from floods or was derived from a lake with a nearly constant water level.

Secondly, it is surprising that such genera as *Bithynia* and *Lymnaea* are not better represented. They dominate the fauna in the lowland lakes at the present time (e.g., Lough Bunny) and are the main genera in the Fergus River muds together with *Ancylus*. Perhaps a partial explanation is that the material in the cave has been strongly size-sorted. The maximum size of shell is about 3 mm. The larger shells of such genera as *Bithynia* and *Lymnaea* may have been washed elsewhere. However, even if this happened small fragments and opercula should have been found in greater numbers if these genera were abundant.

The age of the deposit is presumably not earlier than the Atlantic period (Zone VIIa), though the possibility of it being interglacial cannot be entirely ruled out. It is interesting to note that it contains no *Theodoxus fluviatilis* which now occurs abundantly in parts of the River Fergus.

My thanks are due to Mr. B. W. Sparks for identifying the species of *Pisidium*.

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#### APPENDIX 2

##### REPORT ON THE FERGUS RIVER CAVE ERRATICS

By

B. E. LEAKE, Ph.D.

(Department of Geology, University of Bristol)

A number of erratic pebbles from the Fergus River Cave were examined. The assemblage as a whole consists of igneous-textured granite pebbles with smaller amounts of pure quartzite, clayey sandstone, porphyry dyke-like fragments and pieces of migmatite. They may be classified into four groups:

(A) This group consists of: (a) fine-grained aplitic granite; (b) hornblende-potash felspar-plagioclase granite in which the hornblende is partly altered to chlorite plus epidote; (c) bits of muscovite-bearing quartzite and pieces of quartz; (d) a schistose, fine-grained granite with chlorite after biotite; (e) a slightly clayey sandstone with an interesting piece of hornblende schist intruded by a migmatitic granite.

(B) This group consists of pebbles and fine-grained acid granite, other coarser grained granite, a clayey sandstone and a migmatitic granite.

(C) This consists mostly of a dark igneous rock, which is probably a chilled, acid, porphyry dyke rather than a basic rock, and some quartzite fragments are also present.

(D) The material in this group is mostly granites, some with potash feldspar phenocrysts and some containing hornblende. Also present are muscovite-bearing quartzite fragments and a piece of migmatitic granite.

On the whole, this assemblage could have been derived from the Connemara basement and the Galway granite complex. While it is impossible to identify any fragments with certainty as coming from the area, or to rule out completely other sources of supply, it seems probable that this area was the source of supply. This is based on the similarity of the migmatitic granites to those found in Connemara; the similarity of the quartzite fragments to the main quartzite, which is usually rich in muscovite, in Connemara and the resemblance of the igneous granites to the various facies of the Galway granite. The piece of migmatite intruded into the hornblende schist is particularly helpful and the prophyry dyke fragments are also useful as pointers to this diagnosis. The pieces of sandstone could have been derived from the Silurian sandstones which are now exposed in north-east Connemara.