

The 1926–7 excavations of the Creag nan Uamh bone caves, near Inchnadamph, Sutherland

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ABSTRACT

The Creag nan Uamh caves were excavated in 1926–7, but only a preliminary report was ever published. The recent examination of unpublished letters and manuscripts has allowed the compilation of a more detailed picture of the stratigraphy of the cave deposits, and the remains found therein, than has previously been available. The stratigraphy, faunal content and archaeological remains of each of the caves are presented, and the conclusions reached by the excavators concerning the age of the deposits and the archaeological significance of the site are discussed from a modern standpoint.

INTRODUCTION

A crag of Cambrian limestone stands high above the valley of the Allt nan Uamh, some 5 km S of Inchnadamph in the Assynt district of Sutherland (fig 1). The crag contains three caves of fairly large dimensions – from E to W, Bone Cave, Reindeer Cave, and an un-named cave – and a number of other niches and rock-shelters. The most easterly of the caves was excavated in 1889 by B N Peach and J Horne of the Geological Survey (Peach & Horne 1917). Further excavations were carried out in 1926 in the remaining two caves by J E Cree and J G Callander in consortium with J Ritchie of the Royal Scottish Museum, Edinburgh. As a result of these excavations, Peach and Horne's Bone Cave was re-excavated in 1927 in order to re-assess their published evidence. Although a preliminary report of the first year's work was compiled (Callander *et al* 1927; also Cree 1927), the results of the total excavations have never been published.

This paper attempts to remedy this situation by bringing to light hitherto unpublished material, following the inspection of letters and manuscripts in the possession of the Natural History Department of the Royal Scottish Museum. From these letters, much additional information regarding the stratigraphy of the caves and the faunal and archaeological remains has been assembled. Although little of the original deposits in the caves remains to date, samples of the original sediments were collected by the excavators and have also been preserved in the Royal Scottish Museum.

BACKGROUND TO THE 1926–7 EXCAVATIONS

In their paper of 1917, Peach and Horne attributed the formation of the Creag nan Uamh caves to the 'Late-Glacial' period, when drainage in the limestone emerged at that level owing to the presence of glacial drift in the valley. Their six-layered stratigraphy of Bone Cave is reproduced schematically in fig 2. Of particular note are layer 4, a clay layer, interpreted as having been derived from the quartzite slopes of Breabag, ' . . . carried on the surface of a glacier and shot into the cave from the lobe of ice that passed down the valley' (Peach & Horne 1917, 341), and the overlying layer of 'cave earth' in which, it was said, the presence of man in the cave was shown by

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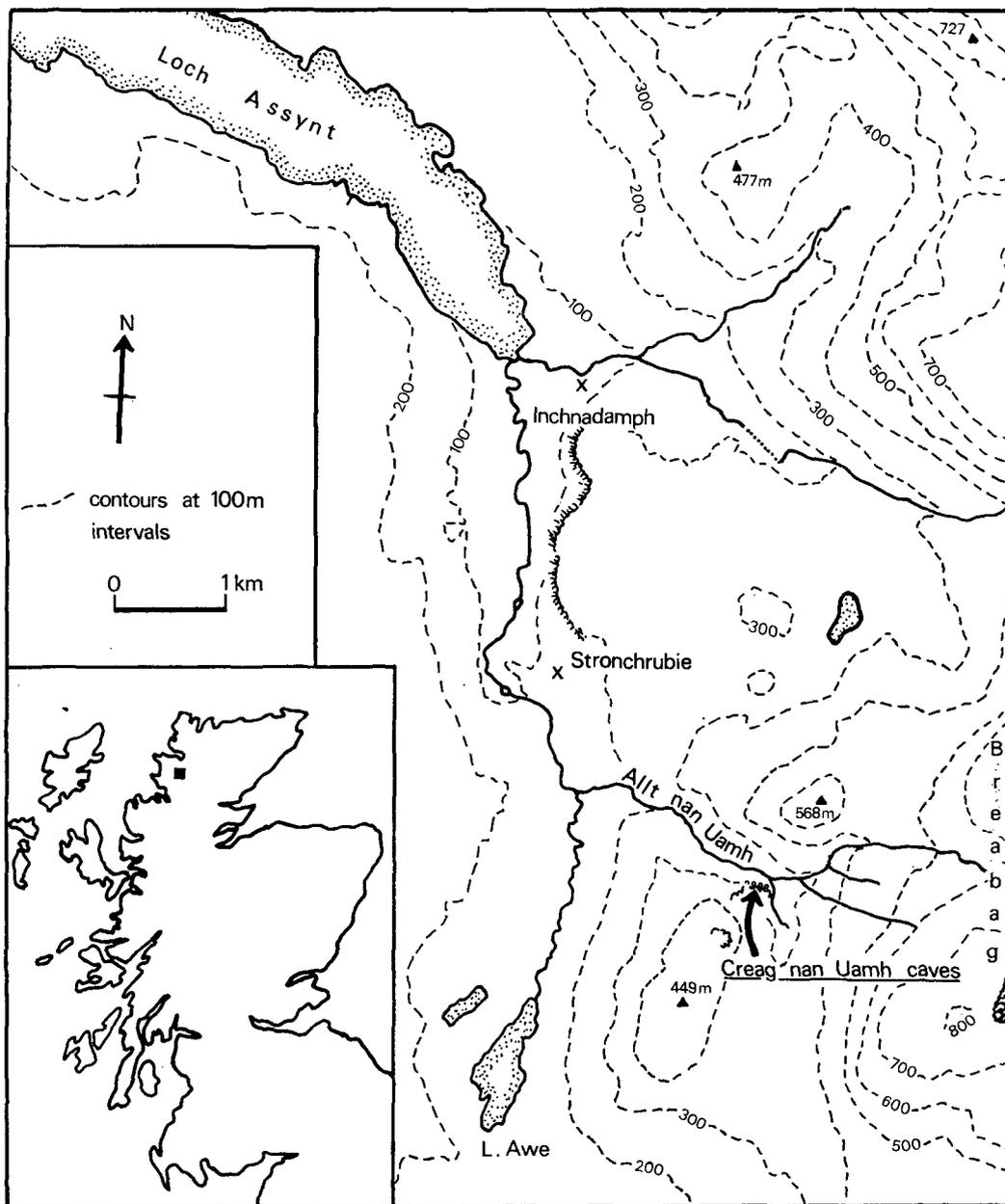


FIG 1 Location of the Creag nan Uamh caves

'fireplaces and firestones, split and burnt bones . . . [although] no artefacts were detected' (Peach & Horne 1917, 341).

Their interpretation of the stratigraphy of this site seems to have remained unquestioned for many years, and is still quoted in certain recent publications (eg MacGregor & Phemister 1972; Johnson & Parsons 1979). Peach and Horne's work was not followed up until J E Cree found the incisor tooth of a bear and two pieces of antler of a young reindeer in one of the other caves on the

crag, in the summer of 1925. These finds provoked Cree, together with Callander and Ritchie, into deciding to excavate the two remaining caves on the crag. Ritchie visited both Peach and Horne in 1925, as reported in letters he sent to Cree. Peach informed Ritchie that he did not consider the chances of finding anything in the caves to be very promising, and seems to have been generally unhelpful; he was however very ill at this time, and died early the next year. Horne on the other hand thought there was every chance that fresh excavations would provide interesting results. The 1889 excavation had been concerned only with Bone Cave, and the other caves should therefore have remained completely undisturbed. Horne intimated that the excavation in Bone

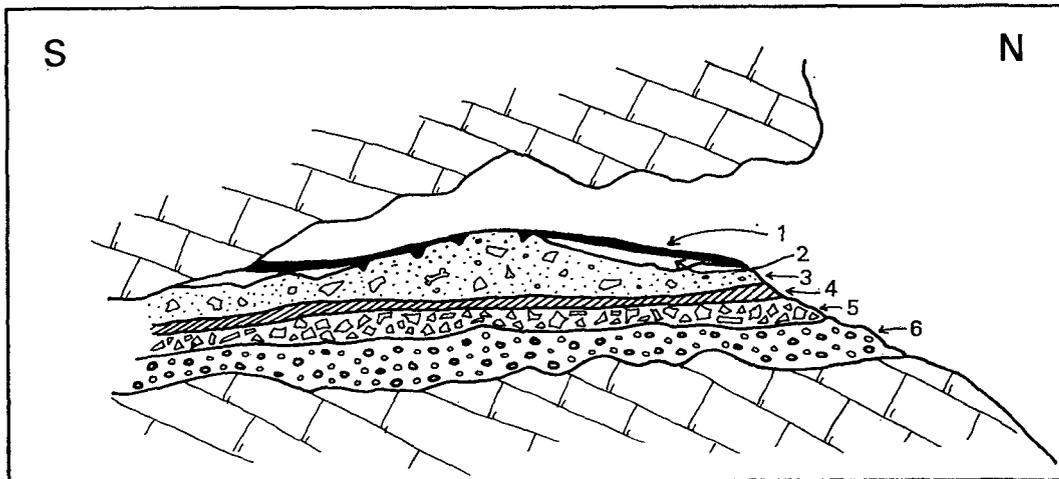


FIG 2 Schematic cross-section through the deposits of Bone Cave (redrawn from Peach & Horne 1917, 340)

Layer

- 1 Peaty layer – sheep dung.
- 2 Whitish marl – containing remains of shells of Pupa-like land snails.
- 3 Red cave earth – clay with limestone splinters. Many faunal remains, including species now extinct in Scotland. Presence of man indicated by ‘hearths’ (?). Wet and mild conditions.
- 4 Grey clay – derived from glacial debris from slopes of Breabag, shot into cave from surface of a valley glacier.
- 5 Limestone fragments – frost-shattered from walls and roof of cave’s interior. Contained arctic fauna. Cave dry.
- 6 Gravel – well-rounded. Representing drainage through limestone from slopes of Breabag and limestone plateau. Water issued out of cave’s mouth, as shown by imbrication of particles. Glaciers still in high ground to east?

Cave had been fairly thorough, and the chances of finding anything else in it would be slim. Indeed, in a letter to Ritchie dated 30 October 1925, Horne stated that this cave ‘was completely dug out to the back wall, and most of the material . . . was thrown outside the cave on to the scree’. In the light of what was later discovered, the reader is asked to bear in mind this apparent reluctance of both Peach and Horne to suggest a re-evaluation of their own excavation in Bone Cave. However, it was with the help of Horne that a grant of £150 was secured from the Royal Society of London to finance excavations in the caves.

The preliminary report of the 1926 excavations (Callander *et al* 1927) gives a fairly good idea of how the work of the first field season progressed and of the discoveries that were made. However, the examination of letters sent by Cree and Callander, who superintended the excavations, to Ritchie, who remained in Edinburgh except for brief visits to the site, together with information

contained in several unpublished reports and manuscripts, has allowed for a more detailed picture of the stratigraphy of the deposits to be compiled. Likewise, the work of a second field season in 1927 is again to be found in letters, and also in a set of handwritten notes prepared by Ritchie, apparently intended to be a report to the Royal Society of London. No sign of Cree's original field notes could be traced by the author after a prolonged search of likely sources: it is assumed that they are no longer in existence. No modern survey of the Creag nan Uamh caves has been produced as yet, but a plan of the caves surveyed by a Mr McWilliams was found with the letters; fig 3 is based on McWilliams's survey, with certain annotations rewritten for clarity.

The following sections present the results of the 1926 and 1927 excavations for each of the caves in turn, with reference to their stratigraphy, their faunal content, and any archaeological remains. An attempt will be made to present the conclusions that the excavators reached from the results of their work, and these conclusions will be compared with present knowledge of the Lateglacial and Flandrian environmental history of the area and the distribution of the earliest prehistoric sites in northern Britain.

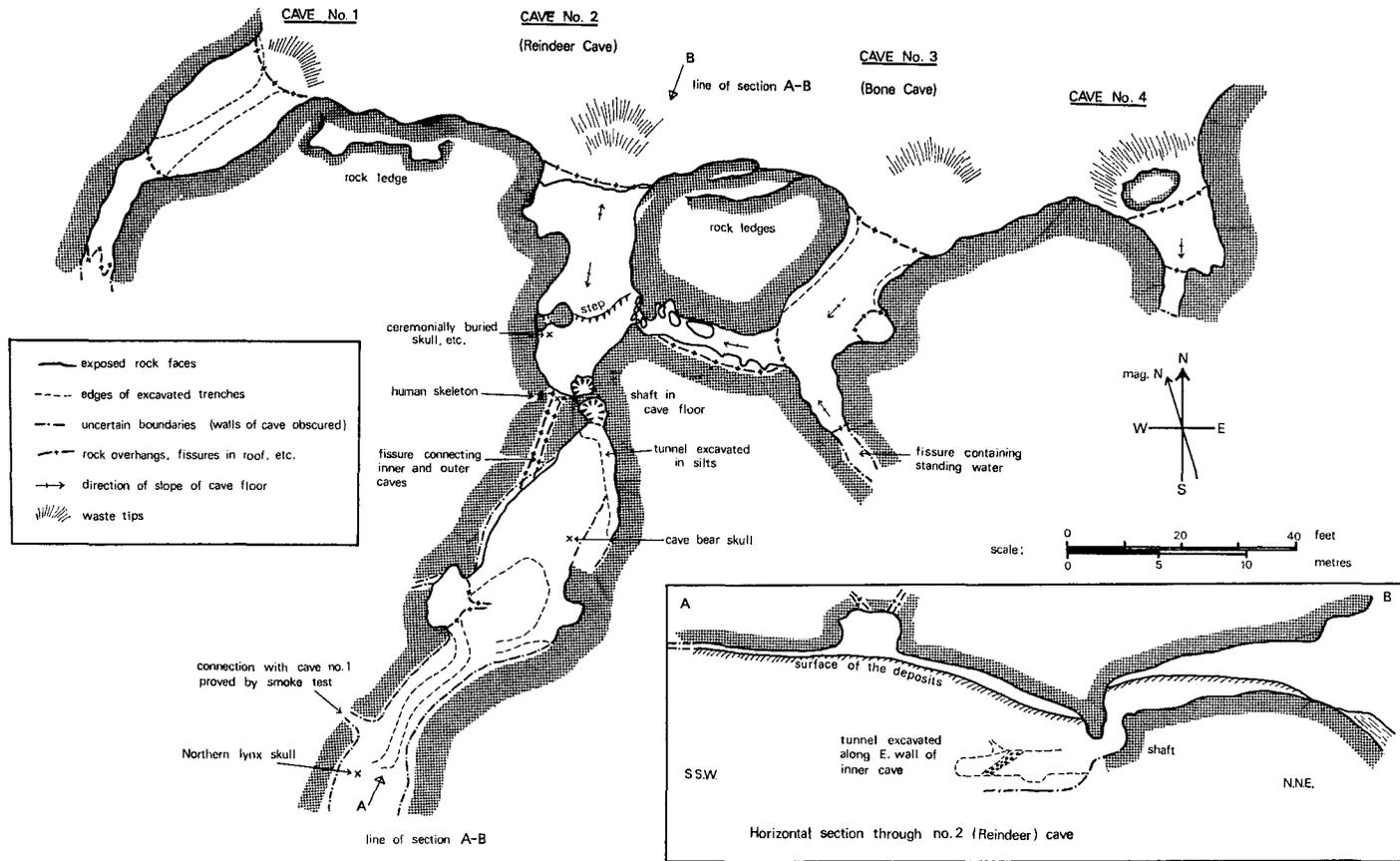
THE WESTERNMOST CAVE (UN-NAMED) – CAVE No 1

This cave, comprising two chambers leading to a series of crawl-passages at the back, was the first to be excavated in 1926. As reported in Callander *et al* (1927) and Cree (1927), finds in this cave were scarce and of limited interest. Excavated by a median trench down to bedrock, it was found to be necessary to lower the floor of the cave at the back of the entrance chamber in order to gain access to the inner chamber, which was separated from the outer cave by a large fallen roof-stone. A connection with the inner Reindeer Cave via the crawl-passages was later proved by a smoke test.

The cave stratigraphy consisted of an upper red 'cave earth', more consolidated towards the base, overlying a layer of 0.6 to 1.2 m of bluish clay containing angular limestone fragments. The upper layer is reported as having been c 0.9 m deep at the entrance, c 0.6 m deep some 2 m from the entrance, and thinning out rapidly towards the back of the chamber. The inner cave was filled with c 1.2 m of reddish-brown silt; little or no stratification was present. No water-worn pebbles were found, so no active streamway seems to have been present in the cave throughout its depositional history.

All the faunal remains were found in the red 'cave earth', especially in its upper part. The letters report that the remains of frogs, the pinion bone of a large bird (unspecified), and the bones of mammals including the lower jaw of a wildcat (*Felis silvestris*) were found towards the back of the outer cave. The presence of the shells of certain land snails was also reported. The excavators believed that most of the bones were brought into the cave by predatory mammals, and were not of any particularly great age.

Archaeological finds were sparse, and few details are given in the letters to indicate the stratigraphic positioning of these objects. However, it seems fairly likely that they all came from the upper layer of the outer cave. At the highest part of the cave's floor, 0.6 m from the northern side of the cave within the upper red layer, a series of flat stones had apparently been placed together to form a hearth, as evidenced by the occurrence of a small lenticular layer of burnt organic matter. A few bones in the vicinity were said to show the marks of a cutting implement and the marks of teeth, though the reasons for these interpretations are not stated. Many small pieces of charcoal were found within the red 'cave earth'. At the back of the outer chamber on the S side, a portion of the blade and tang of an iron knife were found within the lower levels of the 'cave earth'. A finely made knife handle was also found in these upper deposits: carved from a



THE CREAG NAN UAMH BONE CAVES

FIG 3 Plan of the Creag nan Uamh caves (redrawn from the unpublished 1927 survey by McWilliams)

piece of deer antler, it was fluted along its length and had a small ovoid hole drilled at one end. The handle had never been used, and was interpreted as being fairly recent in age. The excavation in the inner chamber brought to light a human femur, projecting from the side of a burrow some 0.8 m from the surface of the deposits, 2.1 m from the entrance. It was believed that it had been brought into the cave by animals: no burial was apparent, and no other human bones were recovered from the cave.

After excavating some 12 m into the cave in three weeks, it was decided to abandon work here in favour of Reindeer Cave.

REINDEER CAVE - CAVE No 2

As the excavation of this cave proved to be the most interesting, much more information is available from Cree's and Callander's letters. A fairly good picture of the stratigraphy and finds from this cave has been assembled, greatly aided by two of Cree's original drawings of sections through the deposits, reproduced here as figs 4a and b.

Fig 4a shows a section of the deposits 2.4 m from the entrance, and can be taken as typifying the stratigraphy from the cave mouth back to the rock step (fig 3). From this step to the back of the outer chamber, the stratigraphy was as shown in fig 4b, the section at a point 4.6 m from the entrance. It can be seen that an additional gravel layer was found towards the back of the cave. This stratum was interpreted as having been introduced into the cave from Bone Cave by way of the connecting passage.

An idea of the sedimentary characteristics of the principal layers within the stratigraphy was gained from an unpublished report written for Ritchie by J Phemister, an officer of the Geological Survey, who visited the site in August 1926 when the cave had been almost completely excavated. He described a small part of the section left intact on the eastern side of the cave. However, Phemister's sub-division of the profile does not match that of the excavators, and both Cree and Ritchie seem to have disagreed vehemently with certain aspects of his description, which makes valid judgements on provenance and mode of deposition of the different layers very difficult. Nevertheless, the areas of agreement between the excavators and the geologist allow the following points to be made:

- (a) the lower gravel layer (fig 4b, layer v) was visibly different from the upper gravels (fig 4b, layer iii), being devoid of faunal remains and being composed of a greater proportion of quartzite, vogesite, felsite and porphyrite pebbles. The particles also showed a greater degree of roundness.
- (b) the upper gravels were composed largely of limestone fragments, generally subangular in appearance, but pebbles of quartzite, vogesite, felsite and porphyrite are also reported. Layers of sand and grit were apparently found within this stratum, but no details were given. This layer contained numerous remains of reindeer and other animals.

Both the above layers were inclined at an angle of about 15° towards the back of the cave, according to Phemister's report. At the rear of the outer chamber, a fissure is reported as having contained 'peaty material' (actually a layer of sheep's dung), 'cave earth' and some of the upper gravel layer. As the excavation progressed, a shaft was discovered at the back of the cave, full of gravel and brownish sand. Between 1.8 and 2.1 m down this shaft, a layer of splintered limestone occurred, and at a depth of 2.7 m the gravels gave way to silts. Further excavations revealed that these silts almost filled to the roof a large inner cavern to the SW of the outer cave. Trial trenches were dug through and over part of the deposits in this inner chamber (fig 3). Fig 5 shows

Phemister's drawing of the section revealed by a trench dug southwards from the bottom of the shaft. Discrete layers and pockets of sands and gravels are shown in the silts, indicating a complicated depositional history. The steeply plunging bed of water-worn gravels shown on the left-hand side of fig 5 were analysed for lithological composition by Phemister. A count of 50 pebbles gave the following results: quartzite 50%, vogesite 26%, felsite 14%, limestone 10%. This contrasts with the results of a similar count of pebbles from the outer cave: limestone 48%, quartzite 18%, pipe rock 2%, vogesite 30%, diorite 2%. Recent work by the author suggests that this count relates to pebbles from the lower gravel layer. A discussion of the various interpretations of the depositional history of Reindeer Cave will be left till later.

Faunal remains were restricted to the 'cave earth' and upper gravels in the outer cave, and to the top 0.3 m of the silts in the inner cave. The 'cave earth' of the outer cave contained mammal and bird bones apparently of no great age. No detailed analysis of the species present seems to have been made. However, mention is made of the more significant finds, namely the canine tooth of a brown bear (*Ursus arctos*) and the enamel 'shells' of two others, and the presence of three limpet shells, two saltwater mussel shells and a few shells of *Helix nemoralis*. The subangular upper gravels contained large numbers of reindeer antlers and a smaller number of reindeer bones. The antlers were almost exclusively those of young animals. Over 830 antler burrs were excavated, signifying the presence of the remains of at least 400 individuals. None of the antlers seemed to have been worked in any way, but some appeared to have been cut from the skull rather than shed; some were also reported to have teeth marks on them. No faunal remains are reported from the lower layers of the outer cave. Within the gravels filling the shaft at the back of the chamber, a canine tooth and other bones of bear were found at a depth of some 1.8 m; many reindeer bones and portions of antler were found above this depth.

No great number of bones were found in the upper layers of the silt in the inner cave. A few antlers and bones of reindeer and other smaller mammals are mentioned in the letters to Ritchie. However, two finds are worthy of note. In the 1926 field season, the discovery of the jaw of a cave bear (*Ursus spelaeus*) is reported, together with the remains of arctic fox (*Canis lagopus*). The following year, the remains of a northern lynx (*Felis lynx*) were discovered at the back of the inner cave (fig 3): the skull was complete except for one upper incisor tooth; two vertebrae and all the bones of one leg, excluding the foot, were also found. An almost complete skull of a bear, bones of young bears, young wolves, young reindeers and the remains of small arctic rodents were discovered in the 1927 season.

Several discoveries which can be considered in an archaeological context were found in the outer cave. Nothing of archaeological interest was found in the inner cave. From this it was adduced that the inner cavern had been blocked off from the outside world by the time man was first in the area. Objects of archaeological interest from the outer cave are as follows:

- (a) A bone awl found on the eastern side of the cave, near the entrance, in the red 'cave earth'. 127 mm long, it had been formed from an irregularly shaped piece of bone. It appeared to have been much used, as its point had been broken off, and the edges were rounded and smoothed with wear. It possessed a flat surface which was highly polished: striae on this face indicated a filing motion, possibly induced during the process of manufacture.
- (b) The head of a bone pin found in the 'cave earth' on the western side of the cave between the pillar and the wall (fig 3). 1.8 m further into the cave, the lower part of the same pin was found, accompanying a ceremonially buried human skull.
- (c) The buried skull referred to above, found in the 'cave earth' behind the limestone pillar on the W side of the cave. Next to a small horizontal natural hole in the limestone, two flat

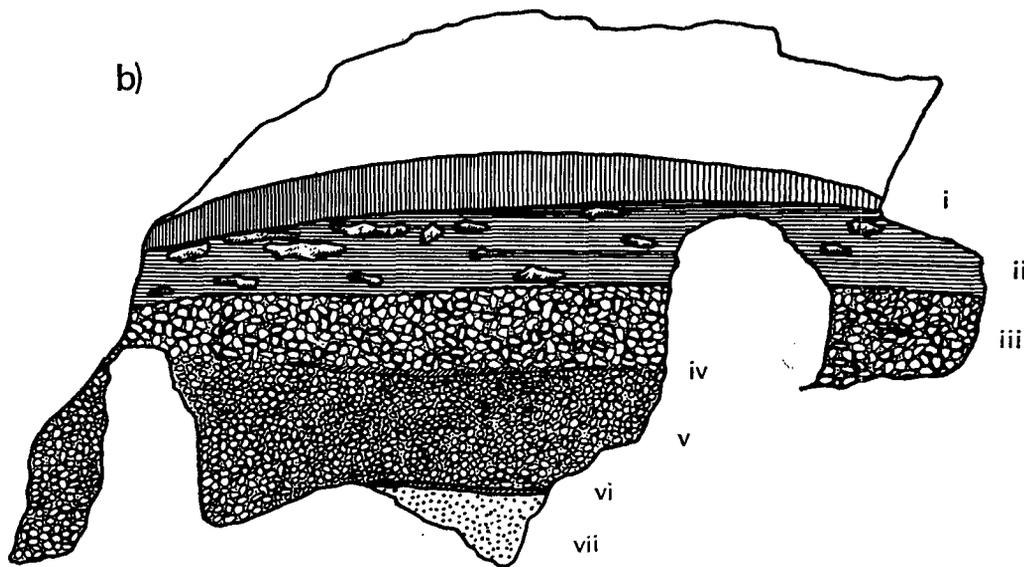
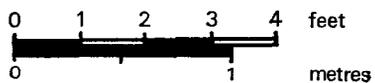
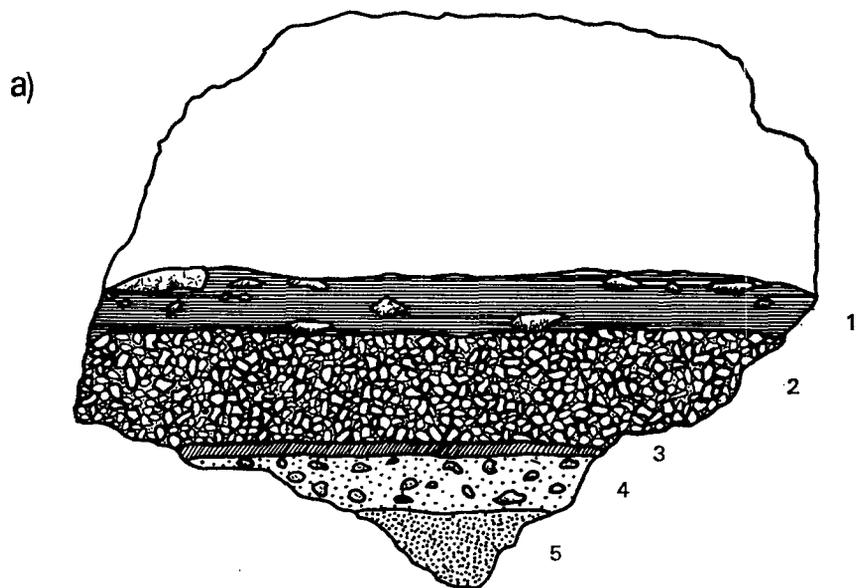


FIG 4 (Caption on facing page)

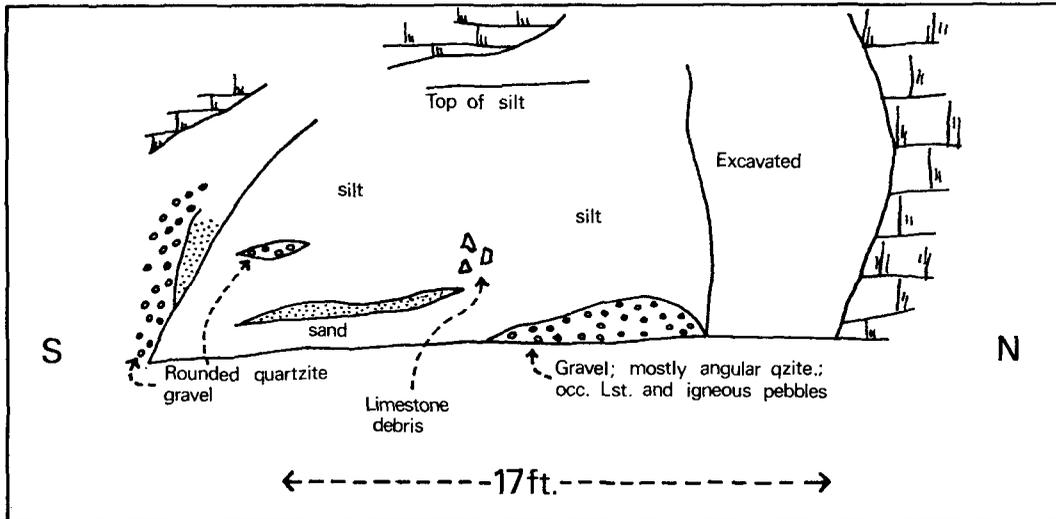


FIG 5 Section through the deposits of the inner chamber of Reindeer Cave (W side of trench dug southwards from the bottom of the shaft at the back of the cave). Redrawn from J Phemister's unpublished report

stones had been placed on end against the cave wall to form a small enclosure. The human skull found within this enclosure was dolichocephalic in shape (long-headed), and minus both upper and lower jaws. It was found resting on its occiput with the top of the skull pointing towards the back of the cave (ie face towards the roof of the cave). Only a few other human bones were recovered (viz some of the vertebrae and the sacrum).

- (d) A second burial was uncovered in the narrow fissure at the back of the cave. In this case, all the human remains were found in a confused heap in an area no bigger than c 0.36 m². They were only lightly covered with 'cave earth', and seemed to have been rather unceremoniously bundled into the recess. The remains lacked one of the femur bones, and it was suggested by Cree that the femur found in cave no 1 might prove to be the missing bone, carried into the other cave by some scavenging animal, such as a fox. The skull, which was brachycephalic (short-headed) lay face upwards against the rocky floor with the other bones piled haphazardly on top, as if the body had been placed or thrown head downwards into the fissure. Some of the teeth of the upper jaw had never erupted, and there seemed to have been marked pyorrhoea in the lower jaw.

FIG 4 The stratigraphy of Reindeer Cave, from original drawings by J E Cree

- (a) Cross-section 2.4 m from the entrance:
- 1 Cave earth with fallen roof-stones
 - 2 Subangular gravel containing bones of reindeer, etc.
 - 3 Grey sand
 - 4 Grey clay containing quartzite
 - 5 Greyish-yellow clay
- (b) Cross-section 4.6 m from the entrance:
- i Peaty material (sheep dung)
 - ii Cave earth with fallen roof-stones
 - iii Subangular gravel containing bones of reindeer, etc.
 - iv Grey sand
 - v Barren gravel
 - vi Greyish sand
 - vii Yellow clay

- (e) A javelin or spear point was found, in association with the bear bones mentioned above, 1.8 m down the vertical shaft at the back of the cave. Made from a tine of reindeer antler, it had a rounded point and had been broken across its thicker end. A groove running from the thick end towards the point was probably used to attach the implement to a shaft by splicing.

Apart from these obvious cultural remains, several of the other finds deserve further attention, as they may be of archaeological significance. Firstly, the presence of the shells of limpet and saltwater mussel in the cave sediments demands explanation. The nearest arm of the sea is at Kylesku, some 16 km to the N. This distance would seem to preclude an animal having carried them into the cave, so it would appear most likely that they were introduced into the deposits by man. The presence of so many fragments of antlers in the upper gravels presents a major problem. No artefacts were found in direct association with these remains, but Cree seems to have favoured an archaeological explanation for this stratum. Phemister, on the other hand, considered that the upper gravels were a stream deposit, and that 'the animal remains have been carried into the cave and not merely covered up in place'. However, his reasoning is not very clear, so some doubt must remain whether the faunal content of this layer was man-induced or not. The passage connecting Reindeer Cave with Bone Cave had apparently been blocked with some large limestone boulders. These stones overlay the lower gravels which issued into the cave from this passage, but seemed to be set below the upper gravel layer. Whether or not this was the work of human hands remains a matter of conjecture. Finally, the presence of small pieces of charcoal in the 'cave earth' and upper gravel layer might indicate human habitation of the cave. However, no discrete hearths were found, and the charcoal might equally be interpreted as burnt vegetation blown into the cave from the moorland outside.

BONE CAVE – CAVE No 3

As a result of their findings in Reindeer Cave, Cree and Callander decided to investigate the deposits left by Peach and Horne in Bone Cave in order to tie in the stratigraphies of the two caves. Although Horne had told Ritchie that Bone Cave had been completely excavated (see above, p 9), a letter from Cree to Ritchie in July 1926 questioned the reliability of this statement. Cree wrote that after a few days' work he believed that the cave had been excavated only in parts and subsequently backfilled. He was scathingly critical of the old excavations when he qualified this view in a later letter to Ritchie, dated 26 June 1927:

The excavations *perpetrated* by Peach and Horne have been of a *very* perfunctory character, apparently. We found one place near the mouth of the cave – about 3 ft long by 2 ft wide – which had undoubtedly been taken out. But so far, we have got no evidence of any other ground having been taken out, although from surface indications, I believe some sort of hole has been dug in the deposit towards the back of the cave.

The main excavation in the cave took place in June 1927. The excavators made an opening in the little terrace immediately outside Bone Cave and slowly worked inwards, digging a median trench and carefully removing a layer at a time, in sections. Samples of each layer were taken, as had been done in the other caves. Sections through the deposits were left on the eastern and western sides of the cave. These were later studied by Haldane, a geologist, and the Abbé Breuil, famous for his excavations of cave sites in France. The passage connecting Bone Cave to Reindeer Cave was almost completely excavated, and another passage at the back of the cave, descending to the SE, was investigated until standing water blocked the way. The stratigraphy of the deposits was as follows:

- (i) At the base of the deposits a dark grey clay was found, reported by Callander as containing 'chunks of silicified limestone'. This apparent contradiction in terms can be resolved if it is assumed that these pieces of rock were in fact chert or quartz, which occur as discrete bands in the limestone. A yellow clay occurred in 'sponge-like cavities' in the surface of this stratum.
- (ii) A thick layer of clay (up to 0.6 m deep) containing quartzite stones, overlaid this layer. It had a very irregular surface, and varied in colour from a very yellow clay on the W side of the cave to quite a red colour in the centre. This colour change may have been due to differences in the amount of roof-drip. Callander suggested that it may have been introduced as a 'run' from the small passage at the back of the cave.
- (iii) Above this, on the W side of the cave only, was found a clean grey gravel. It was found in a discrete channel: 'Near the mouth, 5 ft in from datum line, was a long pocket 6 in deep. When it comes to mouth of tunnel to right, it pitches down into the bottom of it and runs right through to the Reindeer Cave, forming the barren gravel on the floor in that cave' (Callander to Ritchie, letter dated 3 July, 1927).
- (iv) Overlying the gravel in the tunnel and western side of the cave, and above the clay layer elsewhere, was found red 'cave earth', much disturbed by burrowing animals. The 'cave earth' in the tunnel was capped by a thin flowstone layer.

Few details concerning the faunal remains were recorded, and the following must be considered a minimal number of the total finds made. Near the entrance, a piece of palate and two molar teeth of a bear (perhaps *Ursus spelaeus*), and the pre-molar of another bear, were recovered. 4.6 m from the entrance of the cave, at a depth of 0.9 m, pieces of reindeer antler and two canine teeth of a fox were found. Also excavated were three lower jaws and other bones of fish. The Abbé Breuil is reported, in a letter from Ritchie to Cree, dated 12 July 1927, as having found the lower jaw of *Lagomys* while he was visiting the caves. A few reindeer antlers were found in the connecting passage, together with what were reported as a tooth and leg bones of an ox. No bones were recovered from the gravel in the cave.

No implements or other cultural remains were recovered from this cave, although pieces of charcoal were found scattered in the upper levels of the deposits. Cree and Callander considered that the fish bones indicated the presence of man in the cave, but they can equally be attributed to the presence of fish-eating animals, such as bear.

EXCAVATIONS IN OTHER CAVES

At the end of the 1927 season, Cree decided to see if there were any other likely cave sites on the crag. A small recess to the E of Bone Cave (referred to as 'Cave No 4' on McWilliams's survey) did not go back very far. About 0.2 m of dark 'cave earth' overlay 0.7 m of light grey clay containing fragments of limestone, above 0.6 m of gravel containing quartzite and other rocks foreign to the cave. The bedrock floor was not reached, and only a handful of bones was recovered. Three other possible sites were investigated, but all turned out to be no more than rock-shelters, and nothing of any significance was found.

AGE OF THE DEPOSITS

Any final report of these excavations would doubtless have included the excavators' conclusions regarding the age, history and significance of the site. However, no such final report was

ever prepared. It is nevertheless clear that the excavators considered the site to be of archaeological and zoological importance, so the question of the age of the deposits would have been foremost in their minds.

Phemister's views on the depositional history of Reindeer Cave, as laid out in his unpublished report, are that both gravel layers in the outer cave were deposited by a stream which entered the mouth of the cave and flowed down the shaft at the back. The silts of the inner cave were seen as the earliest sediments deposited, and the gravels found in the inner cave were not deposited by the same stream that laid down the upper and lower gravels in the outer cave. The fact that their westward surface was above the level of the uppermost layers in the outer cave would seem to preclude the silts from having been deposited by water entering from the mouth of the cave. Hence Phemister suggests that a glacial stream, entering the limestone at a higher level than the caves, flowed into the cave from the back and deposited the silt over a long period of time. Phemister wrote: 'I should think it most likely that the Reindeer [Cave] chimney was blocked up by a local dam of silt and local falls of limestone, and that during the inrush [of the gravel-bearing stream] into the Reindeer Cave the material became soft and slipped, allowing a certain amount of sand and gravel to accumulate in the chimney . . . '.

Cree's ideas were of a similar nature, except that he believed that the lower gravels had been deposited by a stream issuing from the passage connecting Reindeer Cave and Bone Cave. He summarised the depositional history of Reindeer Cave in an unpublished manuscript:

1. The silt filling the inner cave had been carried in from the back and was the earlier deposit. The water carrying this silt had found an exit down a chimney which actually was a continuation of the chimney coming from the cave above.
2. This had at a very remote time been blocked by a large fall of rock from the roof. After this had happened silt still continued to be deposited at this, the lower end of the cave, and the water seeping [*sic*] away gradually.
3. Finally the silt filled up the foot of the chimney where it ascended to the cave above. Then at a later period, the flow of water altered its course and instead of coming in at the back or SE of the inner cave, it found a new channel through the communicating passage . . . it turned S again on entering the Reindeer Cave and plunged down the chimney carrying the barren gravel, etc, with it. This flow however, apparently had been of only short duration, and the stream of water had again been diverted, the final phase being that the water had entered the mouth of the cave and in its course had deposited the stratum of gravel, bearing animal bones, and had filled up the chimney to the same level.'

In order to account for a stream of water entering the mouth of the cave, which as mentioned before is situated on a crag about 30 m above the present valley floor, it is necessary to invoke glacier ice in the Allt nan Uamh valley with its surface at least as high as the cave entrances. Therefore, both the geologist and the excavators directly attributed the deposits in the cave to the last glacial period. The inner cave's silts were deposited when the area lay completely under the last ice sheet, and the gravels in the outer cave relate to a later period when ice had downwasted to form a valley glacier, from which meltwaters flowed into the caves. The red 'cave earth' was considered to be of postglacial age.

Geologists and archaeologists during the 1920s were working within a chronology of glaciation and deglaciation that has been much improved by more recent work. The old 'Highland Glaciation' - 'Valley Glaciation' - 'Corrie Glaciation' sequence, favoured by the early workers of the Geological Survey of Scotland, has been replaced by a more detailed chronology. It is believed that Scotland has been affected by a large number of glaciations during the Quaternary period,

the last of which (the Devensian glaciation) reached its maximal extent in central England around 18,000 years bp (Mitchell *et al* 1973). Most of Scotland was ice-free by c 13,000 years bp, but a return to severe arctic conditions during the Loch Lomond Stadial (c 11,000–10,000 years bp) led to the build-up of valley and corrie glaciers in many parts of the Scottish Highlands (Sissons 1974; 1976). Research into the distribution of Loch Lomond Stadial glaciers in this part of the NW Highlands (Sissons 1977; the author, unpublished data) has shown that there is no morphological evidence that glacier ice occupied the Allt nan Uamh valley during this time. Therefore, if meltwaters from a valley glacier entering the mouth of the cave were responsible for the upper and lower gravel layers in Reindeer Cave, these strata must date from some time during the last full glacial period (ie before c 13,000 years bp).

THE ARCHAEOLOGICAL SIGNIFICANCE OF THE SITE

Callander *et al* (1927) suggested that the presence of so many antlers of young reindeer, some said to be 'humanly cut and scratched' (*idem*, 171), together with fragments of charcoal and the antler implement found in the shaft at the back of the cave, indicated that man was present in the area during the final stages of the last glacial period, ie Upper Palaeolithic man. All the other cultural items, including the two lots of human remains, were found in the red 'cave earth', believed to be of postglacial age. However, the remains of brown bear in the same layer were thought to indicate that at least part of this deposit was of 'quite some age'. The characteristics of the ceremonially interred skull were thought by Ritchie to have an affinity with burial customs during Magdalenian and Azilian times, as shown at some of the French cave sites (eg Placard, in the Charente area). Ritchie also believed that the dolichocephalic skull agreed in size and features with the skulls found in the Oban caves.

Several publications that appeared in the years after the excavations all show interest in the caves as archaeological sites, but owing to a lack of detail in the published reports, the significance of the work in the caves became confused. Movius (1942, 72–4) attempted to relate the stratigraphy of Reindeer Cave to that of Bone Cave as reported by Peach & Horne (1917). Unfortunately, in order to make the Reindeer Cave stratigraphy fit, he had to add a layer that did not exist. Movius saw the scarcity of cultural remains and the presence of so many antlers of young reindeer in the upper gravel layer as representative of temporary occupation of the cave, perhaps during the summer months. Both Childe (1935) and Lacaille (1954) were dubious of an Upper Palaeolithic date for the earliest occupation of the cave. Childe was not prepared to accept the results of the excavations on their face value as 'no distinctive implement was found, the geology of the deposit has not yet been elucidated, and dating by fauna alone so far N is unconvincing since reindeer survived into the Christian era' (Childe 1935, 13). Lacaille wrote, 'the animal bones appear to represent a late arctic fauna which survived in a refuge area into Early Post-Glacial times. In archaeological terms they could not therefore be earlier than Mesolithic' (Lacaille 1954, 29). Evidence in support of such a view has come from the C¹⁴-dating of brown bear bones found in a cave farther up the Allt nan Uamh valley. Collagen from a femur yielded the surprisingly late date of 2673 ± 54 years bp (BM-724) (Burleigh *et al* 1976).

The main problem is to ascertain whether the faunal remains in the upper gravels of Reindeer Cave are a man-induced or a natural layer. The excavators were unable to present any firm evidence for the former: no cultural remains were found in direct association with these remains, and there is only Cree's inference that certain of the antlers had been cut off rather than naturally shed. Further close examination of these remains is therefore necessary.

On purely logistical grounds it seems unlikely that Upper Palaeolithic man spread so far

northwards. The nearest site of this age in northern Britain is the impoverished Kirkhead Cave in Cumbria (Campbell 1977, 168–9; Mellars 1974, 71). For Upper Palaeolithic man to have reached the Creag nan Uamh caves and left no trace of his presence in the intervening 430 km demands special pleading.

CONCLUSIONS

In order to clarify the true significance of the Creag nan Uamh caves in archaeological and palaeoenvironmental contexts, it seems necessary to establish the following:

1. the relative ages, provenance and mode of deposition of the separate sedimentary layers,
2. the age, by both relative and absolute dating methods, of the faunal remains recovered from Reindeer Cave,
3. the environmental significance of the faunal assemblages, and the archaeological significance of the scanty cultural remains (if the latter can be traced), of the two upper layers of Reindeer Cave.

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