
Allt nan Uamh caves

[NC 275 172], [NC 271 166]

Highlights

The site contains two of the most extensive cave systems in Scotland, developed in structurally complex Durness dolomites, and containing sequences of calcite and clastic sediments related to the Pleistocene glacial events.

Introduction

The caves are located in the upper basin of the Allt nan Uamh valley, south-east of Inchnadamph (Figure 8.2). Ten caves have been explored, all of which are developed in thrust sheets of Cambrian–Ordovician Durness Limestone. Allogenic streams drain from outcrops of the underlying Cambrian quartzites in the east, as well as from an overlying klippe of Torridonian sandstone both north and south of the valley. The two main cave systems transmit water from sinks in the upper part of the Allt nan Uamh valley towards a common resurgence at Fuaran Allt nan Uamh. The mapped cave passages cover only a small part of the 2000 m horizontally and 150 m vertically between the sinks and resurgence. They have been described by Ford (1959), Jeffreys (1984) and Lawson (1988).

Description

The Allt nan Uamh Stream Cave drains the northern sector of the basin. More than 1500 m of mapped passages are developed at two levels. The upper series of large, abandoned phreatic passages contains extensive clastic deposits and areas of collapse, but has few speleothems. Many of the passages are aligned on joints, and some of the steeply inclined rifts are developed on thrust planes. A lower series of narrow vadose rifts and low bedding plane passages carries the main water into a constricted sump on a thrust plane. Upstream, long flooded sections of passage alternate with spacious vadose canyons and cascades, above which lies a series of avens and abandoned high-level passages.

The southern drainage passes through the Uamh an Claonaite system, which has over 2600 m of explored passages (Figure 8.6). The modern cave stream flows along the western side of the system; much of its known length is in a vadose canyon, with several cascades, interrupted by flooded sections. Cavity Wall Rift is a fault-guided section where the stream descends gradually along two sections of solutionally enlarged thrust planes which separate two lithologically distinct limestones. The streamway turns south-west through a series of sumps, and then north-west below high-level chambers to a cascade into another sump. Off the main streamway, there are three series of abandoned passages, all at altitudes of 300–340 m. Capital Series consists of a series of largely abandoned, oxbow passages, partly filled with sediment from past periods of ponding. East Block is another high-level series of large phreatic passages, partially blocked by collapse and thick deposits of clastic sediment. The Great Northern Time Machine and other wide chambers above the far streamway are choked very close to the Bone Caves. The old passages contain suites of clastic sediments and calcite deposits which have yielded 22 dates (Atkinson *et al.*, 1995).

The remaining short caves include the Bone Caves which are truncated fragments of old passage in the cliffs of Creag nan Uamh, high above the modern valley floor; the sediments in these caves have provided an important source of Quaternary faunal remains (Lawson, 1993, 1995a). The sinks are choked, except for one shaft 7 m deep into a narrow fissure, and the resurgences are immature.

Interpretation

The Allt nan Uamh caves demonstrate close control by geological structures, including bedding planes, joints, faults and thrust planes within the tectonically complex dolomite beds.

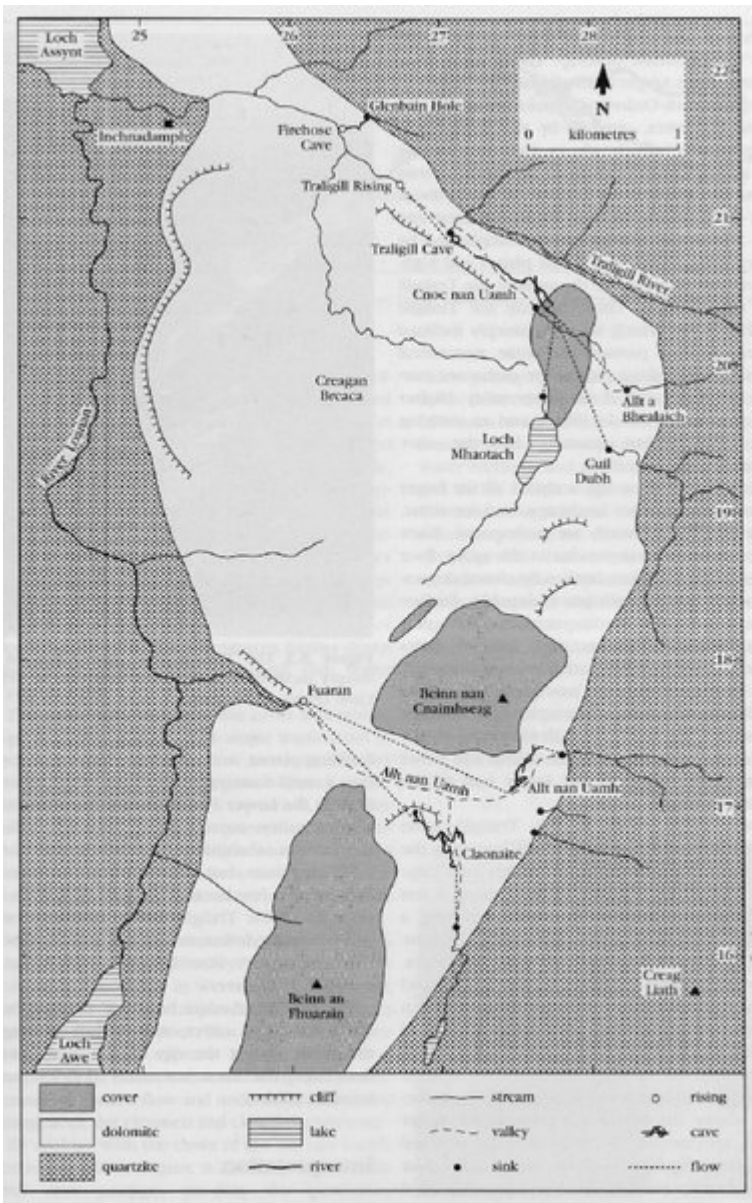
The old high-level passages with their thick clastic sediment sequences preserve a record of the climate and landscape history of this area through much of the Pleistocene. The high-level relict passages in Allt nan Uamh Stream Cave and Uamh an Claonaite, and the truncated passages of the Bone Caves, are the remains of a series of conduits formed close beneath a palaeo-water table at about 340 m. They were abandoned when the main streamway of each cave formed at its present lower level, in response to glacial rejuvenation of the resurgence site. Flowstone from the abandoned passages in Uamh an Claonaite has been radiometrically dated to ages of 12–192 ka (Lawson, 1981, 1988; Atkinson *et al.*, 1995). These results suggest that the main phase of cave development was no later than the Hoxnian, since when the resurgence level has been lowered by about 130 m, probably by three stages of glacial erosion.

The glacial rejuvenation drained the phreatic passages and created the sites for Ipswichian deposition of the oldest stalagmites. The Devensian clastic sediments within the Caves include sub-glacial silts, proglacial sands and gravels, and lag gravels and cobble beds left by meltwater scour during deglaciation (Atkinson *et al.*, 1995; Lawson, 1995b). There was also at least one phase of solutional activity and stalagmite deposition within the Devensian.

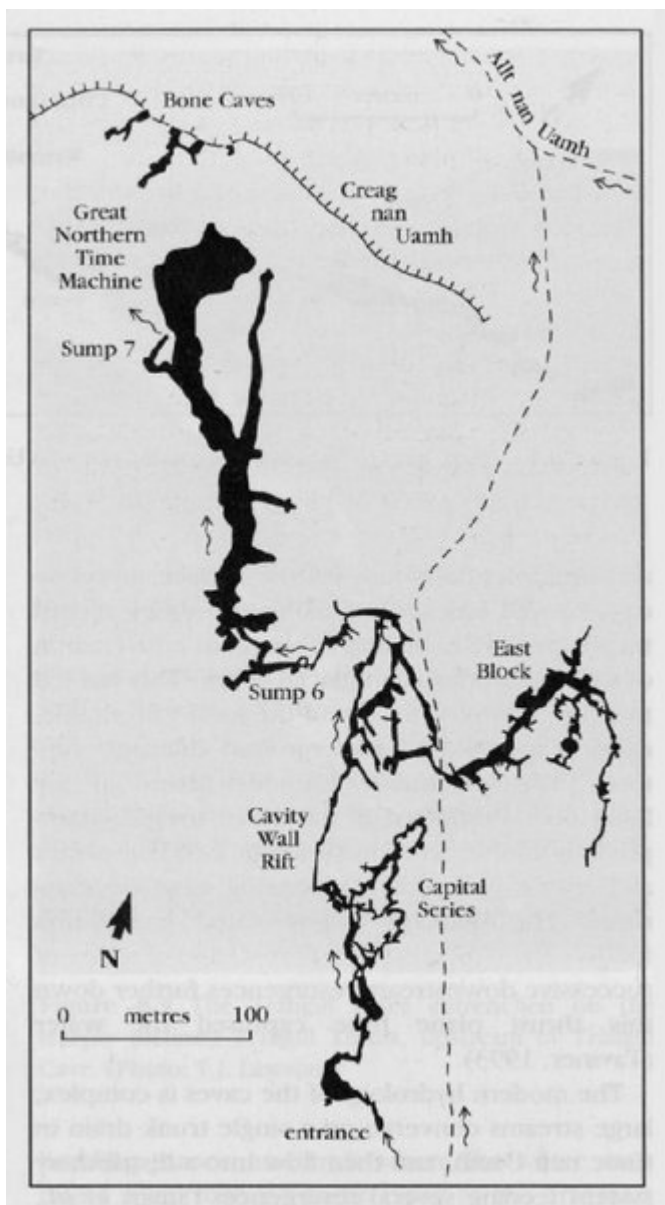
Conclusion

The Allt nan Uamh valley contains two of Scotland's most extensive and complex cave systems, as well as some of Britain's longest caves developed in non-Carboniferous limestone. These caves provide excellent examples of the nature of karst hydrology and geomorphology in structurally complex thrust sheets of dolomite, and their high-level passages contain a valuable sedimentary record of Pleistocene events.

[References](#)



(Figure 8.2) Geological map of the main karst belt in Assynt, containing the caves of the Traligill and Allt nan Uamh Valleys. The dolomites belong to the Durness Group and are underlain by the Lower Palaeozoic quartzites. The cover rocks are klippe of Cambrian quartzite and Eocambrian sandstone lying over major thrust planes.



(Figure 8.6) Outline map of Uamh an Claonaite; the survey beyond sump 6 is only a preliminary drawing (from surveys by Grampian Speleological Group).