Chudleigh Caves

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Highlights

Deposits containing rich archaeological and palaeontological remains make Chudleigh Caves important for reconstructing late Middle and Upper Pleistocene environmental conditions in South-West England.

Introduction

Chudleigh Caves, and Pixie's Hole in particular, have long been important for Pleistocene studies. The caves were extensively excavated in the nineteenth century by Buckland, Ackland, Trevelyan, Northmore and MacEnery among others. Pengelly (1873b) provided a useful account of these early explorations and gave details of the artefacts and bones recovered as the cave deposits were quickly sifted and removed. More recent accounts of the caves and their deposits were provided by Beynon (1931), Shaw (1949a, 1949b) and Simons (1963), and the site has been placed in a wider context by Cullingford (1953, 1962), Sutcliffe (1969, 1974, 1977), Macfadyen (1970), Campbell (1977) and Selwood *et al.* (1984). Detailed accounts have been provided of the cave sediments and fauna (Collcutt, 1984, 1986) and the Palaeolithic and Mesolithic artefacts (Rosenfeld, 1969; Collcutt, 1984). Holman (1988) described a herpetofauna from Cow Cave.

Description

Some 20 caves, mostly small, are located in the Chercombe Bridge Limestone around Chudleigh in Devon (Selwood *et al.,* 1984; (Figure 5.1)). The best known are Pixie's Hole, Chudleigh Cavern and Cow Cave which are located in or around Chudleigh Rocks [SX 865 787]: several fissures in the immediate vicinity also contain important deposits. Chudleigh Rocks is part of a restricted outcrop of the Devonian limestone (Selwood *et al.,* 1984) which has been bisected at Chudleigh by the Kate Brook; the resulting gorge is known as the Glen. The Kate Brook rises on Great Haldon some 7 km to the north-east, and joins the Teign *c.* 0.5 km downstream of Chudleigh Rocks. The geology around the Rocks is complex, and the lithologies traversed by the Kate Brook in its upstream catchment are diverse. The latter, which include Carboniferous shales and sandstones, Devonian limestone, Lower Cretaceous pebble and shell beds and, notably, the Upper Carboniferous/Lower Permian Teignmouth Breccia, are important constituents of the cave sediments (Collcutt, 1984). The GCR site consists of Chudleigh Rocks themselves (containing the caves of Pixie's Hole and Cow Cave), Chudleigh Cavern a short distance to the north and part of the gorge (containing Tramp's Shelter). The site includes slope and terrace deposits which may eventually be linked with the history of the caves themselves.

Cow Cave

Cow Cave [SX 8646 7867] is located on the south side of the Rock. Its entrance, some 6 m wide by 4.5 m, high leads into a spacious cavern about 18 m long (Shaw, 1949b). This cave receives no mention in Pengelly's (1873b) account of the Chudleigh Caves, and it is not clear if any of the early cave explorers, such as MacEnery or Buckland, visited it. The first account of the cave, its layout and deposits, appears to be that by Beynon (1931) who summarized the results of excavations by the Torquay Natural History Society between 1927 and 1931. Unfortunately, none of the mammal remains, including bear, wolf, fox, hyaena, deer, wild cat, Irish deer and ox, nor the eight flint implements, comes from a known stratigraphic context. Beynon (1931) alludes to a stratigraphic sequence of surface 'limestone' soil, overlying stalagmite and a series of cemented and uncemented breccias, but even these details are unclear. Great numbers of well-rounded pebbles were also described from the cave, and were believed to have been washed in by great floods during a 'long pluvial period' (Beynon, 1931). Collcutt (1984) comments that the cave deposits described by Beynon appear to bear similarities with the Siliceous Group described from Pixie's Hole (Collcutt, 1984; see below). The Torquay Natural History Society excavations continued at Cow Cave until at least 1935 (Alexander, 1933, 1934, 1935), although

no further detailed publication followed (Collcutt, 1984). Human remains, and those of rhinoceros and beaver were added to the faunal list and one flint of Aurignacian type was recovered (Alexander, 1935).

The most detailed accounts of this cave, however, are those by Simons (1963) and Rosenfeld (1969). Simons recorded the following stratigraphy:

6. Stalagmite floor

5. Frog stratum

4. Stalagmite floor

3. Reindeer stratum

2. Broken stalagmite floor

1. Stream deposit

Based, unsatisfactorily, on the state of their preservation, Simons assigned bones to the various stratigraphic levels. The earliest deposit (stream deposit; bed 1) was deemed to have yielded bear, lion, hyaena, red deer and a rodent. The reindeer stratum (bed 3) is considered to have contained bear, hyaena, bison, reindeer, hare, red deer, roe deer and water vole (Simons, 1963). From the most recent clastic sediment, presumably the Frog stratum (bed 5), are believed to have come the remains of hare, rabbit, dog, hedgehog, sheep, pig, horse and humans among others (Simons, 1963). The occurrence of *M. nivalis* among the various rodent remains excavated from the cave by Simons, led Sutcliffe and Kowalski (1976) to speculate that a pre-Ipswichian deposit may be present at the site. However, the tooth in question is non-diagnostic of the species, and *M. oeconomus* (common in the Late Devensian) is a likely alternative.

Rosenfeld (1969) recorded that six flakes of Middle Palaeolithic age had been recovered from the cave. One flake, from Simons' (1963) investigations, had purportedly come from bed 1. Since the Reindeer stratum (bed 3) lying above this deposit and above a layer of fractured stalagmite (bed 2) was believed to be of 'last glacial' (Devensian) age, it has been speculated that this artefact may have been derived from an interglacial deposit of pre-Devensian (possibly even pre-Ipswichian?) age (Rosenfeld, 1969; Sutcliffe, 1969). The flakes were described by Rosenfeld as coming from prepared cores, some having faceted platforms, but none being of distinctive types. Campbell (1977), on the other hand, regarded the artefacts as of Earlier Upper Palaeolithic age. In addition to the Middle Palaeolithic (Rosenfeld, 1969), Aurignacian (Alexander, 1935) and 'Azilian' (Beynon, 1931) age interpretations, it is even unclear whether the authors are referring to the same or to different objects (Collcutt, 1984). However, the 'Azilian' piece referred to by Beynon is extant (a curved-back point), and almost identical to those found by Collcutt in Pixie's Hole: these tools are indicative of a date late in the Devensian Stage.

Collcutt (1984) has argued that Cow Cave and Pixie's Hole were probably once connected; the westernmost extension of the latter consists of a sediment-choked passage at the same level, and only *c.* 12 m from the easternmost extension of Cow Cave, which is similarly choked with deposits (Collcutt, 1984).

Tramp's Shelter

Tramp's Shelter lies on the south-east side of the Kate Brook, almost above the waterfall (Collcutt, 1984). It occurs in a steep bluff of limestone and has a south-westerly-facing entrance at *c.* 51 m OD. This deep shelter penetrates about 10 m inwards from a 6 m-wide entrance. The history of excavation at this cave is far from clear; certainly much material has been removed from the cave and at its entrance (Collcutt, 1984). Rosenfeld (1969) refers to work by Miss M. Collins and a cave earth which had yielded bones of *Bos, Equus* and *Cervus elaphus* Linné. The same deposit also apparently contained a 'backed blade industry with obliquely blunted blades' (Rosenfeld, 1969). Campbell (1977) refers to excavations by Smith, apparently in 1968, and refers to 10 artefacts, possibly attributable to the late Upper Palaeolithic.

Collcutt (1984) also briefly examined Tramp's Shelter, recording at least 2 m of homogeneous deposits (limestone scree and blocks set in a dense matrix of red gritty clay), and recovered several flint artefacts (certainly of Later Upper Palaeolithic age).

Chudleigh Fissure

The location of this feature is not clear. It is recorded as a palaeontological site which has yielded the remains of small mammals (Sutcliffe and Kowalski, 1976) and birds (Bramwell, 1960) indicative of cold conditions probably during the Devensian Stage. An early reference to the site by Hinton (1926), cites Kennard as the original excavator (Collcutt, 1984).

Pixie's Hole

This cave is located on the south side of Chudleigh Rocks (at [SX 8654 7867]), and passes through the remaining limestone which has been left by quarrying on both its northern and southern sides (Collcutt, 1984; (Figure 5.3)). It is undoubtedly the most important of the Chudleigh Caves. It is a relatively small but complex cave system, the full extent and layout of which are not fully known. Shaw (1949a, 1949b) provided descriptive details of the cave and passage morphology. He recorded a vertical network with 265 m of passages and with four openings; Selwood *et al.* (1984), however, refer to only three openings. The areas relevant to the recent investigations are clearly marked on a plan given by Collcutt (1984) (Figure 5.3). The most important area of the cave currently known is the relatively simple eastern section, although farther west the cave develops on at least four different levels, and choked passages lead off perhaps linking up with other named entrances elsewhere in the Chudleigh Rocks (Collcutt, 1984). Much of the long eastern passage, which runs northwards into the Pope's Chamber, is developed in a near-vertical fault (Collcutt, 1984). The cave formerly contained fine karst features including stalactite curtains (Shaw, 1949b), but these have been seriously degraded by visitors. (The entrances are now gated.)

The earliest known reference to the cave is that in Ridson's *Survey of Devon* (carried out between 1605 and 1630; Ridson, 1911), although it was probably first mentioned in a scientific context by Paddon (1797) who estimated the extent of the cave. Buckland is the first recorded excavator: according to Pengelly (1873b), he probably dug there in 1824–1825, finding flints, pottery, domestic animal bones and charcoal. The results of these excavations were never published by Buckland, although brief mention is given to the site in his 1824 *Reliquae Diluvianae.* Again, according to Pengelly (1873b), Buckland visited the cave in 1825 with Sir Thomas Acland, finding the remains of 'antediluvian animals' such as hyaena, deer and bear. Excavations were continued between about 1829 and 1841 by MacEnery, but little extra faunal material was recovered (Pengelly, 1873b). From the notes and letters left by these early workers, including Northmore, Pengelly (1873b) summarised that the remains of rhinoceros, ox, hyaena, deer, bear, elephant and hippopotamus had been recovered from the caves at Chudleigh.

Collcutt (1984) excavated at four, locations within the eastern part of Pixie's Hole, proving depths of cave sediment in excess of 5 m. The stratigraphy is extremely complex and variable across the cave: Collcutt provides a comprehensive lithostratigraphic classification of the deposits. These are, from top to bottom, as follows:

17. Stalagmitic floor (STF)

16. Silty Clay (SCL)

15. Diamicton (DIA)

14. Stony Cave Earth (SCE)

13. Stony Silt (SST), Dark Silt (DST) and Light Silt (LST)

12. Dark Earth (DET)

11. Grey Clay and Silts (GCS)

10. Red Clayey Sand (RCS)

9. Red Sand (RSD)

8. Red Sandy Gravel (RSG)

7. Friable Speleothem (FSP)

6. Concreted Stones (CST)

5. Silty Fine Gravel (SFG)

4. Cemented Gravel (CGL)

3. Loose Gravel (LGL)

2. Dense Gravel (DGL)

1. Silt, Sand and Gravel (SSG)

Interpretation

Units 1–10 were classified by Collcutt (1984) as the Siliceous Group. Bedding structures in these sediments suggest that they were emplaced largely by water, although at various levels there are also signs that deposition occurred by mass movement (debris flow). The overall impression of the sediments which comprise this group, however, is that they are similar to normal subaerial alluvial fan deposits (Collcutt, 1984). Within this part of the sequence, the carbonate-rich units (6 and 7) are clearly identifiable as a cave breccia capped by a stalagmitic floor (Collcutt, 1984). Most of the bones recovered from unit 6 are those of bear. Unit 7 is almost certainly an interglacial deposit. Collcutt favours an Ipswichian age, although the material (recrystallized) is undateable.

The succeeding Grey Clay and Silts (unit 11) appear to have entered the cave via a fissure in its roof: the overlying Dark Earth (unit 12) is composed of similar material, and its convoluted lower boundary may suggest subsequent mass movement (Collcutt, 1984). The overlying silty units (unit 13) appear to have been emplaced by wash processes; fine lag gravels, 'puddle' deposits and micro-deltas also occur in these units, providing evidence for a complexity of depositional environments within the cave system at this time. Taking the sequence as a whole, there appears to be evidence for a reduction in energy levels up through the deposits. Some of the sediments within unit 13 may have been derived from loessic material outside the cave: remains of woolly rhinoceros C. *antiquitatis* in this unit have been seen as compatible with a 'Main Devensian' age (Collcutt, 1984). These secondary loess deposits are closely comparable with deposits in the platform sequence at Tornewton Cave and may be of a similar age.

Unit 14 is a typical cave earth composed largely of limestone debris. The lack of non-calcareous silt in its matrix may suggest that external sources of silty drift (loess?) had been depleted by this time (Collcutt, 1984). The succeeding sediments (unit 15) were undoubtedly emplaced by mass movement, being derived largely from sediments elsewhere within the cave system. The sharp transition between this and the underlying bed probably represents an erosion surface (Collcutt, 1984).

The overlying Silty Clay (unit 16) is predominantly a fine-grained sheet-wash deposit. It is capped by the Stalagmite Floor (unit 17). The calcareous deposits from unit 13 upwards contain common faunal material, both megafauna and microfauna (Collcutt, 1984). Preliminary examinations of the recovered material suggest that the bones of bear, hyaena, wolf, fox, reindeer, red deer, *Bos* sp., woolly rhinoceros and horse are present (Collcutt, 1984). Initial interpretations of the fauna indicate that it forms a 'cold' assemblage, perhaps of later Devensian age (Collcutt, 1984). The presence of *Bos* at this high stratigraphic level might suggest an interstadial, possibly the Windermere Interstadial (see below).

Collcutt's (1984) excavations also yielded archaeological material, some 400 artefacts largely of flint, all referable to the Later Upper Palaeolithic (*sensu* Campbell, 1977). Dense spreads of redeposited charcoal occur between units 15 and 16, and some flints also show signs of having been burned, indicating that there is evidence for at least one hearth to have been present within the cave (Collcutt, 1984). Collcutt plotted the positions of the recovered artefacts and concluded that the principal source was the Stony Cave Earth (unit 14), which may have carried a 'living floor'. The distribution of the finds suggests that in places this floor may remain undisturbed. Nonetheless, elsewhere, the artefacts have been reworked and incorporated into the overlying mass flow deposits (Collcutt, 1984). There appears to be no typological difference between the artefacts found in these units. Although the artefacts and hearth feature of unit 14 may amount to an 'archaeological occupation', there is no direct evidence to relate the artefacts to the faunal remains (Collcutt, 1984). Much faunal material does occur at this level in the sequence, and while there are many herbivore bones which it is tempting to relate to the archaeological material (butchered?), the occurrence of carnivore bones suggests that animals such as wolf, may have been responsible for the accumulations (Collcutt, 1984).

Conclusion

The Chudleigh Caves and the landforms and deposits of the adjacent area contain valuable information regarding the Pleistocene (and earlier) evolution of the region. Unfortunately, much of the evidence presented by early workers was gleaned by excessively destructive methods: the stratigraphical context of most early finds is unknown, and their value for interpreting events therefore limited. Recent excavations at Pixie's Hole, in particular, have revealed a complex sequence of sediments largely attributable to fluvial, mass flow and freeze-thaw processes in the Devensian, and clearly demonstrate the value of the site for reconstructing Pleistocene palaeoenvironments. Even so, there is no absolute timescale for events here as yet, and much of the archaeological and faunal material remains to be published in detail.

Firm evidence for a Later Upper Palaeolithic occupation of Pixie's Hole can, however, be demonstrated. Not far from the main entrance occurs a 'living floor' consisting of a rudimentary hearth (charcoal, burnt limestone and flint, underlain by baked fine sediment). Elsewhere, farther into the cave system, the tools from this occupation have been dispersed by debris flows.

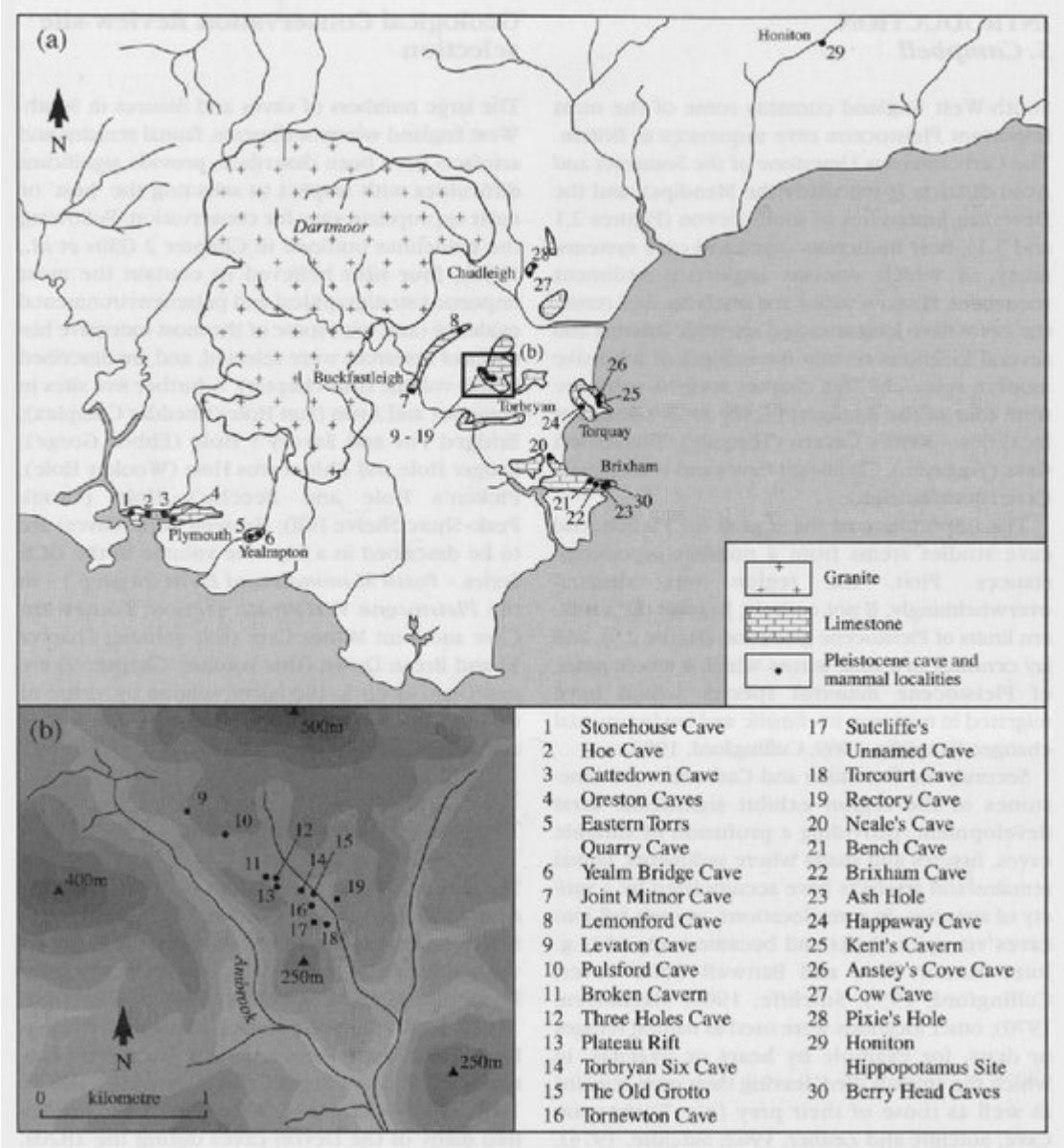
Pixie's Hole, in particular, provides intriguing evidence for the activities of Upper Palaeolithic humans in Devon. It is clear that flint was knapped at the site; debitage, retouched tools and cores have been recovered. It is likely that the occupation occurred in respect both to the shelter afforded by the cave and with regard to local supplies of flint. Although the local flint gravels are not totally unsuitable for tool manufacture, the presence of good quality flint farther afield in the Kate Brook catchment may well have been a critical factor in the selection and occupation of Pixie's Hole (Collcutt, 1984, 1986).

Dating this occupation, beyond a general ascription based on the faunal evidence, to the Late Devensian is problematical. None of the bone or antler recovered from Pixie's Hole carries unequivocal traces of human modification. Indeed, there is ample evidence for the presence at Chudleigh of denning carnivores. Therefore it is not possible to link the archaeological and faunal evidence directly in time. The industry on its own, however, is fully compatible with a Later Upper Palaeolithic date; a Federmesser industry slightly younger than the classic Creswellian seems likely (cf. the 'Final Palaeolithic' of Barton (1996)).

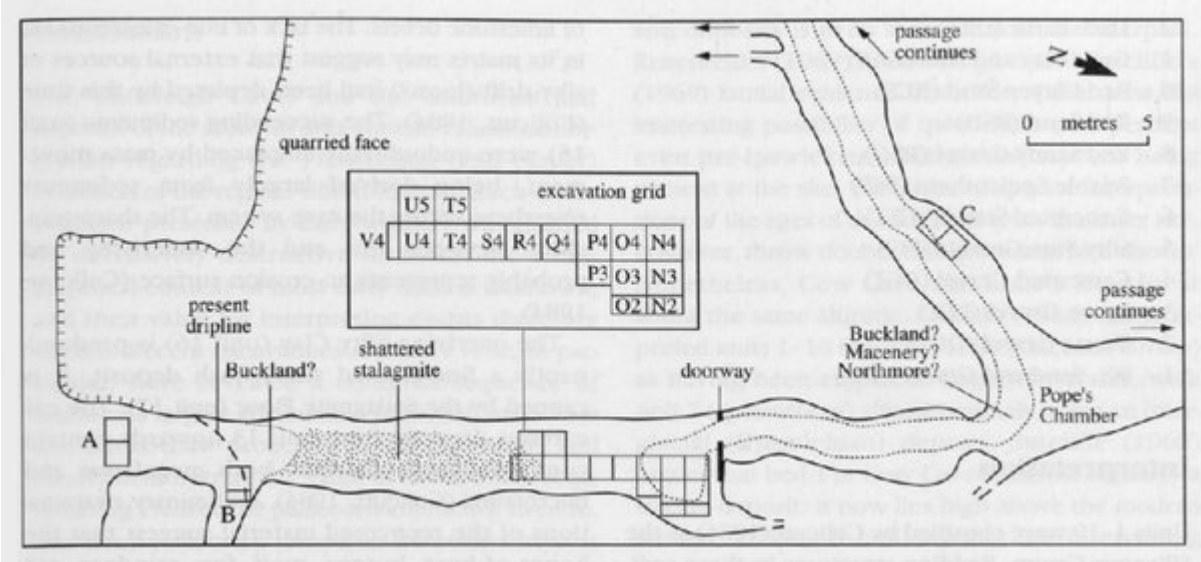
The evidence from the other Chudleigh caves and deposits is even more difficult to interpret. Rosenfeld's (1969) archaeological and Sutcliffe's (1969) faunal evidence from Cow Cave, raise the interesting possibility of Ipswichian (and perhaps even pre-Ipswichian) interglacial deposits being present at the site. The rather disparate interpretations of the ages of the artefacts from the latter site, however, throw doubt on to this claim (see above). Nonetheless, Cow Cave and Pixie's Hole lie at about the same altitude. Collcutt (1984) has interpreted units 1–10 in Pixie's Hole (Siliceous Group) as having been emplaced largely by water, with unit 7 (speleothem) almost certainly being an interglacial (?Ipswichian) deposit. Sutcliffe (1966) argues that bed 1 in Cow Cave is almost certainly a stream deposit: it now lies high above the modern stream, making it unlikely that the intervening downcutting could have taken place within the timespan of the Devensian alone.

The full potential of the Chudleigh Caves for elaborating regional Pleistocene conditions has not yet been realized: their remaining artefact- and bone-bearing beds (Pixie's Hole has the most extensive Later Upper Palaeolithic deposits known to survive at any British cave) will undoubtedly contribute significantly to the growing knowledge of Pleistocene humans and their environment in Devon.

References



(Figure 5.1) (a) The principal localities where remains of Pleistocene mammals have been found in Devon, after Sutcliffe (1969). (b) Excavated caves in the Torbryan Valley, after Roberts (1996). The location of Berry Head 'sea caves' (Proctor, 1994, 1996) is also shown.



(Figure 5.3) Plan of Pixie's Hole, after Collcutt (1984).