

# THE LOWER NESTUS PIPE RE-ENTERED

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**Abstract:** The Lower Nestus Pipe, below the Rutland Cavern show-mine at Matlock Bath, Derbyshire, has been re-entered via a recently discovered short shaft. The pipe-workings are more steeply inclined than those above and can be followed down to some 52m below the Rutland Cavern adit. Late 17<sup>th</sup> century and probable earlier workings were found. There are early shot-holes and woodpecker pickwork, and the archaeology and mineralisation have not suffered the ravages of frequent entry and mineral collection.

## INTRODUCTION

In Winter 2001-02 access was regained for the first time in nearly thirty years to the Lower Nestus Pipe at Matlock Bath, Derbyshire. This was previously explored by cavers via a narrow shaft, about 35m deep, which descended from the slopes of the Heights of Abraham and entered the upper end of the main chamber (Workman and Roberts 1957; Hurt 1968). Subsequently the shaft was lidded and, being in a garden, no access has been allowed. During recent out-of-season maintenance of the nearby Rutland Cavern show-mine (SK 2925 5858), the floor in the entrance adit was taken up; a small sealed shaft was found that led down into the Lower Nestus pipe-workings.

In a brief window of opportunity for assessment, a survey of the workings was undertaken and a photographic record made. Previously, a brief account of the post-medieval history of the workings has been given (Flindall and Hayes 1976). However, the re-examination showed that in parts of the workings there were also indications of probable earlier mining, provided by distinctive small pickwork, nicknamed 'woodpecker work' by Jim Rieuwerts in the 1960s-70s, a word that has come into general usage with mining historians. This is found in abundance in the Upper Nestus Pipes (Rutland and Great Masson Caverns) and has been argued to be of late medieval or possibly earlier date (Barnatt and Rieuwerts 1998); this current paper is an adjunct to the earlier account, which builds upon the detailed interpretation given there.

Because of the interesting workings beneath, the show-mine owner kindly decided that the new shaft should be surrounded by a railing and made a feature for visitors to view rather than be resealed. However, because it lies within the show-mine, there will continue to be no general access to the workings.

## THE LOWER NESTUS PIPE

### Geology and Mineralisation

The majority of the lower workings are similar to those in the Upper Nestus Pipes in that they follow palaeokarst and/or hydrothermal karst pipe/vugh mineralisation in the part-dolomitised beds of the Matlock Limestone between the Matlock Upper and Lower Lavas (Ford 2001). Unlike the upper workings, which to the north-west are virtually horizontal, the beds and pipes within them dip increasingly steeply to the south-eastwards. The pipe-workings immediately below the Rutland Cavern show-mine form a series of small mineralised vughs, often interconnected as more continuous passages, which the miners have followed. These come together below to form one large chamber, the downward continuation of which is choked with backfill. Another short section below can be entered and is again of much smaller proportions.

Minerals commonly found are fluorspar, calcite and barites. There are small amounts of galena and calamine (smithsonite) remaining, though most of the original ores were removed by the miners, and there is also secondary copper mineralisation (Plate 1) and iron minerals. In parts the mineralisation is exceptionally beautiful (Plate 2) and the whole has benefited from not suffering the ravages of mineral collectors.

Parts of the Lower Nestus passages are relatively unmodified by mining and the still recognisable small cave passages that remain are presumably parts of the Pleistocene meteoric cave system which is also present in the Upper Nestus Pipes.

Near the bottom of the main chamber, the pipe-working is intersected by Nestus New Breck Vein, which unusually hades at up to about 40 degrees from vertical. In parts the workings here are over a metre wide and mineral has been removed in a series of stopes; adjacent to the pipe there are two of these that run parallel to each other.

### The Rediscovered Shaft

The shaft, sunk at the intersection of pipe-workings with the end of the Rutland Cavern entrance adit, was covered in timbers and is 6m deep (Figures 1 and 2). The west side is ginged for 2.5m, down to a rock ledge, whereas the north-western end enters a small 'stope-like' working almost immediately. At 4.5m down a small pipe-working is intersected. Hurt's 1960s plan is annotated 'raise boarded over - former connection with Rutland Cavern' (Hurt 1968); his prediction has proven true.

### The Upper Workings

The workings entered by the shaft comprise an intricate series of small and irregular mined passages, roughly one above the other. The first to be entered is part-filled with processed mineral broken-down on average to gravel-size, and a broad but choked passage to the north may well have once linked with the pipe-workings in Rutland Cavern. At the south-western end of the workings first entered from the shaft there is a small mined chamber, largely created with the aid of powder in small shot-holes, but a low earlier working to the north side has a small area of woodpecker pick-work. Near the shaft base, a small short passage in the floor fill, dry-walled to one side, leads to further small pipe-workings leading down. Carrying straight on along these, the workings form an upper link to the main Lower Nestus chamber, with raises to roof workings, the first of which was driven with powder. Below this, one section of narrow passage has a heavily sooted roof, which may indicate the use of firesetting in an earlier phase of mining.

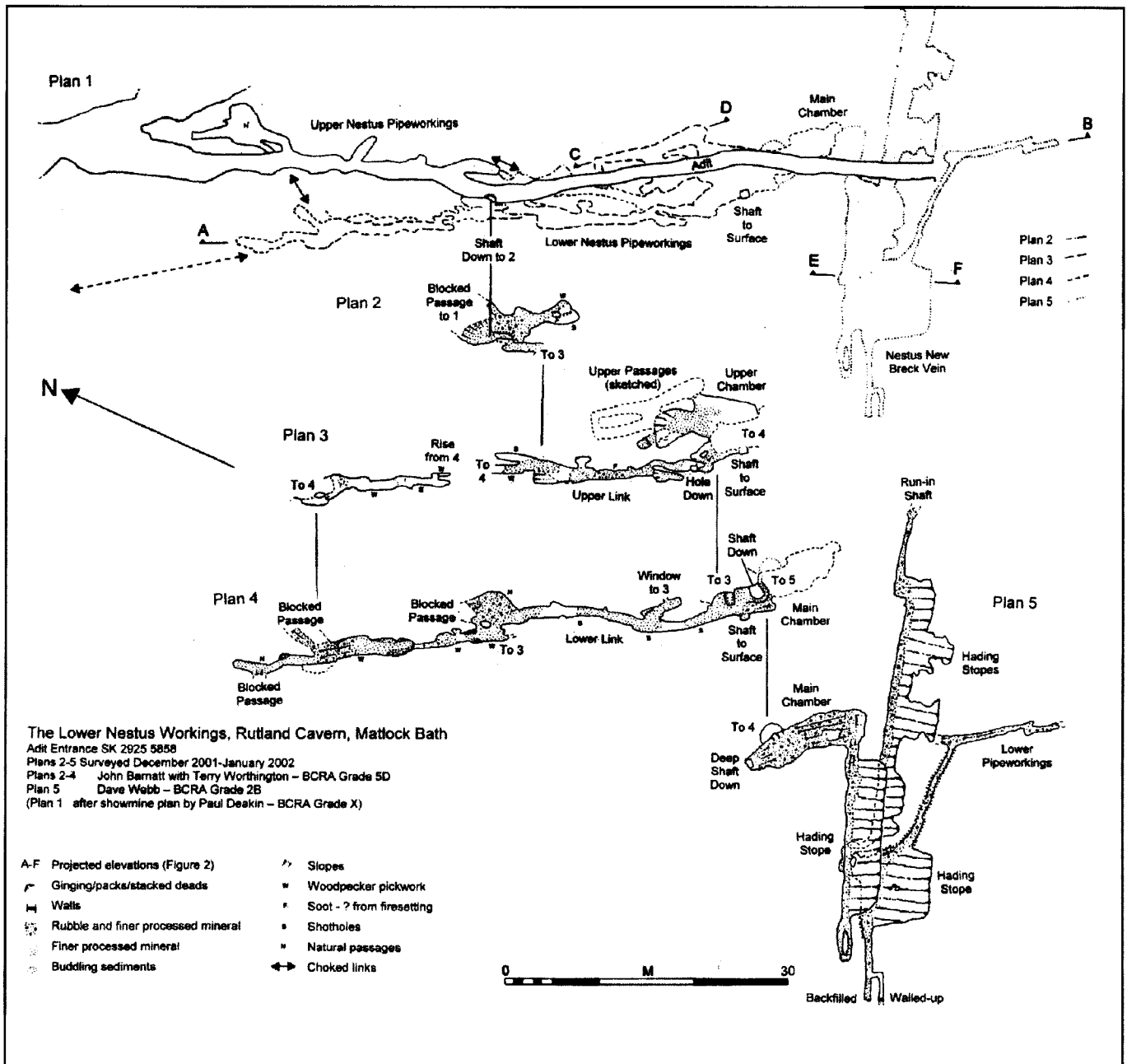


Fig. 1. Plan of the Lower Nestus workings.

Shortly after entering the upper link a further passage doubles back to a point underneath the base of the entrance shaft. To the side there is a small blind trial driven using powder with small shot-holes. Below there is a lower passage which both heads up-dip towards the Upper Nestus Pipes and down-dip to form a lower link to the main Lower Nestus chamber. The passage up-dip has extensive evidence of woodpecker pickwork (Plate 3). There are also a series of fine mine deposits that have been cut through by later miners to regain entry into these workings (Plate 4). The processing of these presumably took place in the spacious Upper Nestus chambers above and the small downward passage, seen as worked-out, formed a convenient place to fill with unwanted waste. Given that the waste deposits were probably cut through in the mid 17th century (see below), it is likely small pieces of ore were being prepared for smelting in an ore hearth, a type of smelter first introduced into the Peak District in the late 16th century (Kiernan 1989). Washing sieves and buddles are first recorded in the orefield in the late 16th century and at the beginning of the 17th century, respectively (Rieuwerts 1998). The deposits comprise a multitude of thin bands of fine material that have

been laid down as excess water ran through the mined passage during many ore-processing episodes (Plate 5). There are four sets of these sieving/buddling deposits, each with a flat top, at progressively lower altitudes as the passage descends, each presumably deposited behind barriers in the passage that caused the water to pond behind them. Today only one such barrier remains, a raised area of rock across the passage, the other three, perhaps piles of deads, must have been removed when later miners reworked the passage.

Near the north-western end of the passage there is a slope of remaining deads which have dropped from a broad but choked ascending passage which once formed a further link with the Upper Nestus Pipes, opposite a point in the show-mine where they are entered by a steeply descending natural passage from above. Beyond this former link the accessible passage changes character, becoming a small and round-roofed cave passage, mostly unmineralised and possibly phreatic in origin. Near its end, which is approximately 7m below the level of the show-mine floor, there is a hole to the side that is choked from above with gravel-sized processed mineral. These indicate a further

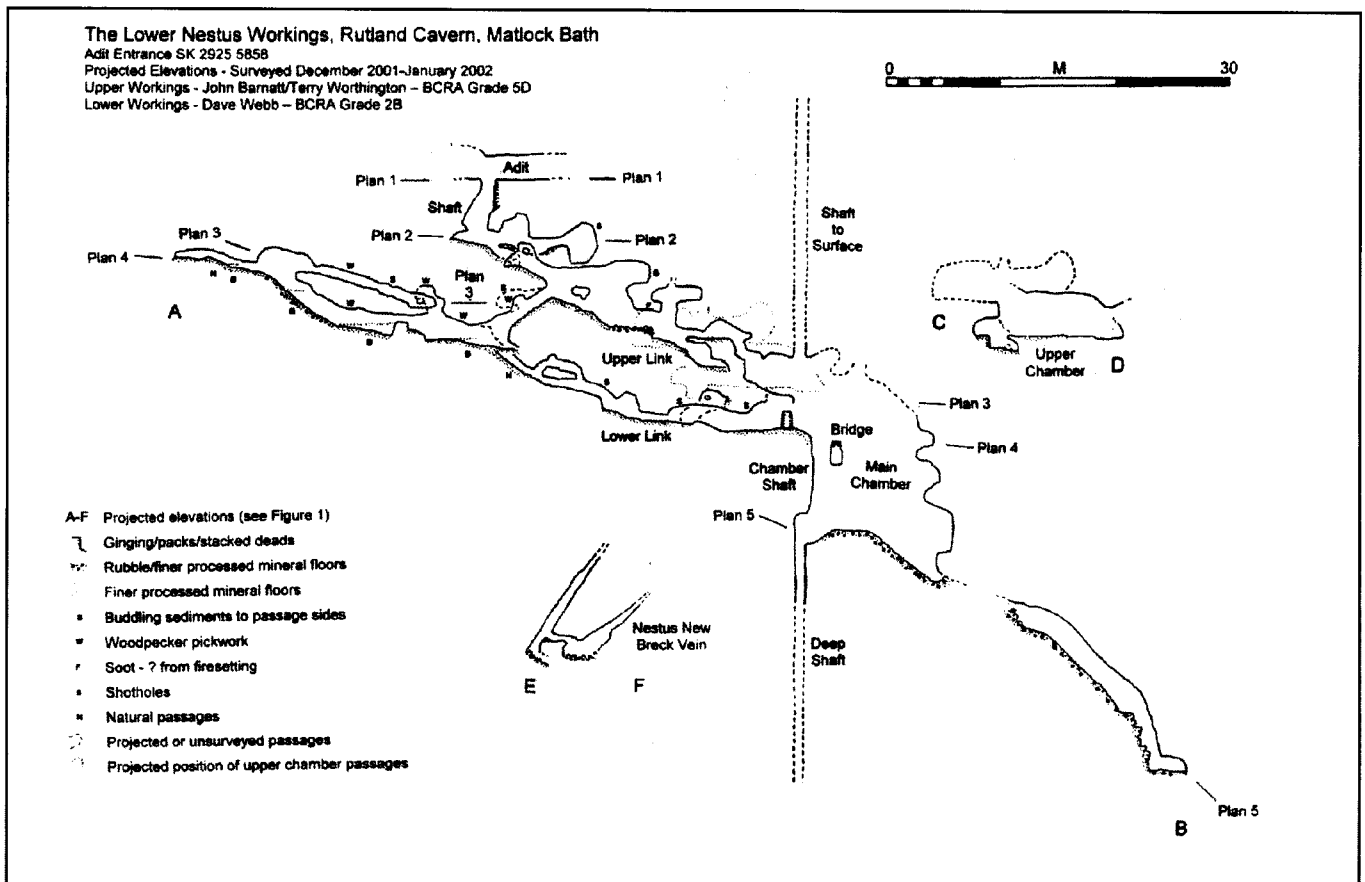


Fig. 2. Elevation of the Lower Nestus pipe-workings.

former link with mine workings somewhere above, perhaps now choked for some distance and coming from the main Upper Nestus chambers north-west of those shown on Plan 1.

In the roof above the junction of cave passage and the broad choked link described above, there is an upper passage running south-east. The first part of this has heavy pick-work and a shothole, while beyond there is further woodpecker work. The second half of the passage, which is slightly offset, was driven down-dip with powder. At the end there is a small hole to a raise from below with woodpecker work.

The first section of the lower link to the main Lower Nestus chamber comprises a largely-natural cave passage developed on a bedding plane with a small aven in one corner. To the north-west this passage is choked with miners' deads; as this point is directly below the first described blocked link with the Upper Nestus pipe-workings near the base of the shaft, both may be parts of the same passage and possibly there is a relatively large chamber here that has been backfilled. Near the lower end of the link passage, beyond a small area with shotholes, there is a flat out crawl, followed by a larger trial working that has been driven with powder from the main Lower Nestus chamber.

Taking the evidence of the three or four identified links to the Upper Nestus Pipes together, they reinforce the impression that the show-mine floor is an artificially created level for the benefit of visitors and in fact there was originally no strong division between upper and lower pipes, except for the narrowing of the pipe deposits at the workings under the show-mine floor that are described here.

#### The Main Lower Nestus Chamber

Both link passages enter the main chamber near its upper end,

adjacent to the small and somewhat twisted shaft to surface that used to form the point of entry for explorers. The irregularly-shaped chamber at this level measures about 15x4m across (Plate 6), with an upper part to one side running a further 6m north-westwards and smaller blind workings ascending beyond (Plate 7). From the point of entry of the lower link the upper part of the chamber has a roof about 7m above. Below, the main chamber descends near-vertically for a further 9m, to deads filling its base to an unknown depth. At the level of the lower link passage from above, there is a 6x2m area with a level made-up floor. Here there is a small pack of deads against the north-east wall, placed here either by miners or more probably by previous explorers. The platform was presumably used as a 'striking house' where ore was raised from below, the kibbles then transferred to the adjacent shaft to surface. On the chamber wall nearby there is an inscription reading '168', the numbers having serifs, probably indicating a pre-19th century date. It is tempting to interpret this as an unfinished 1680's inscription; it is known that miners were working in this chamber from the 1670s. Immediately to the south-west of the platform there is a vertical hole dropping downwards, probably used as a 'shaft' to draw ore from below, separated from the main chamber at this level by a rock bridge (Plate 8). This and a sloping approach-route to the side have been levelled with rubble and clay, presumably to form a walkway. This leads to a cavity in the main chamber-side that would have been ideal for a ladderway to the chamber floor. This route is the easiest way down today.

The description of the lower parts of the main chamber and workings beyond has been provided by information from Lynn Willies, Dave Webb, John Wilmot and Terry Worthington. The author declined to cross the rock bridge. Consequently, whilst the upper passages were carefully surveyed to Grade 5D, the workings beyond the bridge were sketched by Dave Webb

working alone, with compass bearings and tape measurements to establish most of the main passage orientations and lengths

At various places in the lower workings many small shot-holes consistent with early black-powder work have been observed. These have crushed stone or mineral stemming and are highly unusual in that they appear to retain surviving paper from the use of powder cartridges.

At the base of the chamber, at its north-west end, with the base of the 'shaft' upwards offset, there is the top of a shaft of relatively small cross-section, with surrounding ledges and nearby 'seat' (Plate 9). This area was used as a 'striking house' for material from the shaft which was dumped in the main chamber. It also seems likely that the miners raised the ore from the pipe workings from there to surface in two stages, up the shafts described above. Previous exploration has shown that this now blind shaft is 73m deep and is backfilled with rubble at the base. Thermal water was reached in the lowest 6 to 7m (22 feet) of the shaft (Workman and Roberts 1987) which is a little above river level, suggesting a link with Wragg Sough (Flindall and Hayes 1976). Some of the backfill in the main chamber, which probably came from sinking the shaft, is a toadstone clay, suggesting that the Lower Matlock Lava was breached.

#### **Nestus New Breck Vein**

From the base of the main chamber a hading stope to the south-west can be followed. Part-way along there are links with a parallel stope, probably the main workings of Nestus New Breck Vein (Plate 10). At the south-east end there is a backfilled section and a second passage that has been walled up. To the north-west the stope leads to a run-in at the base of a shaft that is thought to rise to surface. Immediately before this there are the remains of a dry-stone wall with its interstices packed with moss (Plate 11), presumably placed here to inhibit ventilation via the shaft.

A small passage leading from part-way up the south-western stope, mostly lined on both sides with dry-stone walling, leads to a narrow and steeply descending passage which may well be a downward continuation of the main pipe-workings. Here there is further possible woodpecker pick-work. Shortly beyond a climb down loose deads, the workings are choked at a point approximately 52m below the show-mine adit.

#### **WOODPECKER PICKWORK AND POTENTIAL MEDIEVAL MINING**

Extensive parts of the Upper Nestus Pipes have fine woodpecker pickwork, which has been argued previously to result from mining practice associated with bole hearth smelting that pre-dates the late 16th century (Barnatt and Rieuwerts 1998). Documentary evidence suggests that much of this working in Masson Great Cavern to the north of Bacon Rake had taken place by about 1470. It is thought that similar work south of Bacon Rake in Rutland Cavern is of similar or somewhat later date. When the Upper Nestus research was published, known comparable woodpecker work was confined to the pipe-workings here and a possible minor example at Dark Hole/Primrose Mine nearby, a little further east along Bacon Rake. More recently, similar pick-work has been discovered in mineralogically-similar pipe-workings at Old Ash Mine near Wensley (Barnatt 2001), detailed assessment of which is ongoing. There is extensive evidence for firesetting and it is documented as being in work in the 16th century (Jim Rieuwerts, *pers. comm.*) so mining may have earlier origins.

That the newly discovered woodpecker-work in Lower Nestus may stop short of the main chamber is consistent with the interpretation of woodpecker work being an indicator of early work, for it is known that this chamber was the site of rich ore output in the 1670s. Similarly, the fine ore-processing deposits which part-fill the woodpecker galleries and which were cut through by later miners, presumably in an exploratory phase prior to the discovery of the rich deposits in the main chamber (see below), argues for an early date for the initial creation of the woodpecker-work passages. These points may thus re-enforce the conclusions on early dating drawn in 1998.

However, if future closer inspection proves the possible woodpecker pickwork below the main chamber to be comparable with that found above, this would suggest the possibility that extraction using small picks or gads in the pipe-working continued into the late 17<sup>th</sup> century. This is contrary to the observations in the extensive pipes above where woodpecker-work is consistently cut by black-powder-work, including examples with small early-type shotholes, and where many instances of this this relative chronological indicator were recorded (Barnatt and Rieuwerts 1998). Similarly, in the upper workings, extraction of late 17<sup>th</sup> century and later date in similar pipe mineralisation appears to have consistently have used a heavier pick. However, small picks were certainly in use at that time since Hooson, writing in the first half of the 18<sup>th</sup> century (published 1749) recorded a very light pick called a "foudenhead" for use in narrow scrins.

From the distribution of most of the woodpecker pickwork and the probable firesetting evidence, it seems that the late medieval miners following the Nestus Pipes down-dip found them increasingly unproductive and may have stopped work 20m or less short of the main Lower Nestus chamber; exploration of the natural cave passage in the lower link would have brought them even closer, while the probable evidence for fire-setting is within 10m. If they had continued mining for

#### **LATER MINING**

The later mining of the Lower Nestus pipe-workings has been reviewed previously (Flindall and Hayes 1976). In summary, it is known from surviving court trial paperwork related to a title dispute, that the mine produced about 6100 loads of ore in 1671-73, compared with 330 loads over a similar period in 1667-69. This suggests that the main Lower Nestus chamber was discovered about 1670; the pipe-workings above, in and around the show-mine, may well already have been largely already worked for their richer deposits well before this date.

A 1678 court dispute makes it clear that Nestus New Breck

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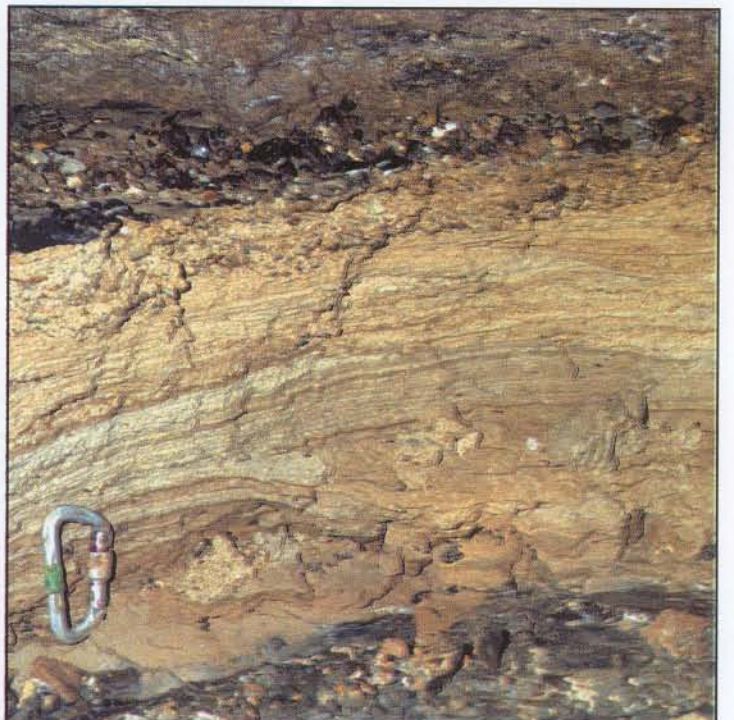
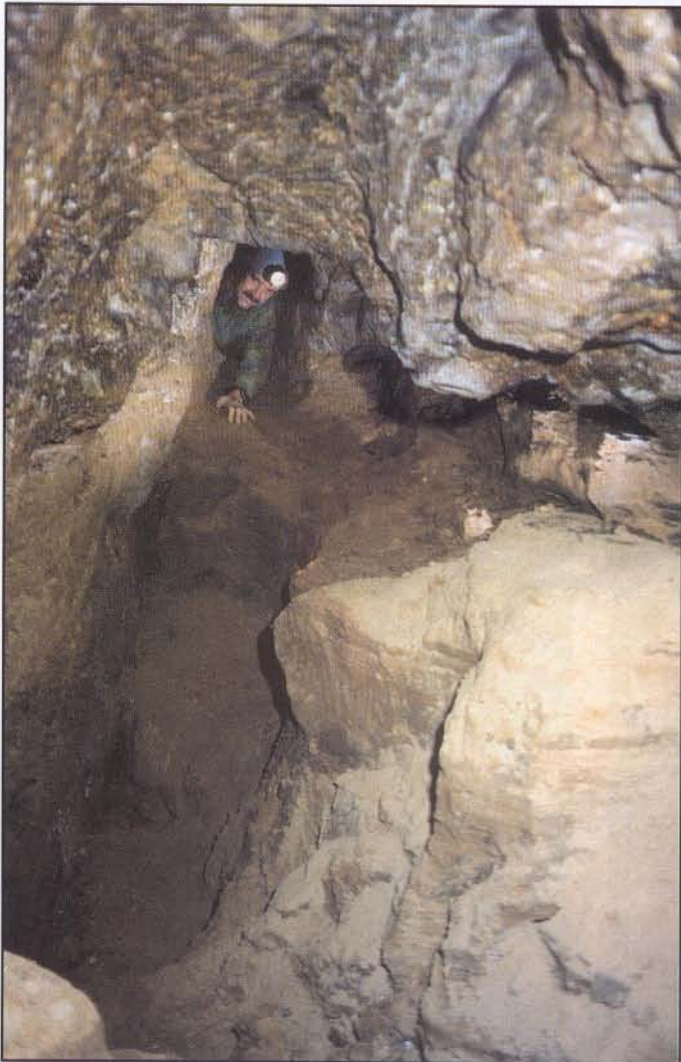
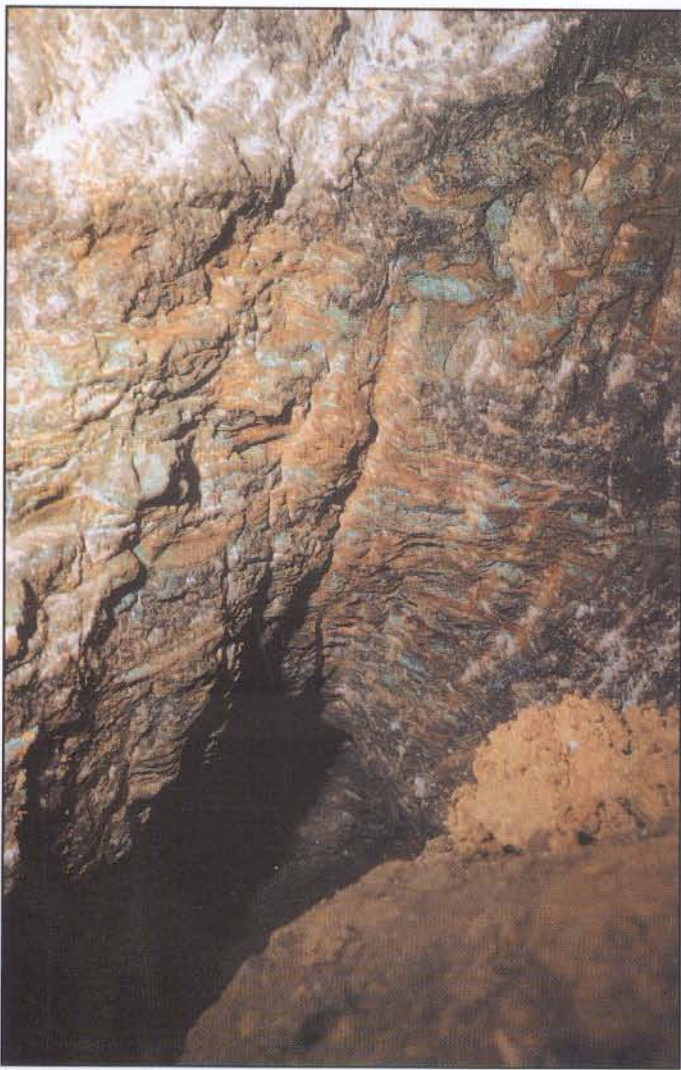
*Plate 1 (top left, opposite page): An example of copper mineralisation in the Lower Nestus workings (Photo by Paul Deakin).*

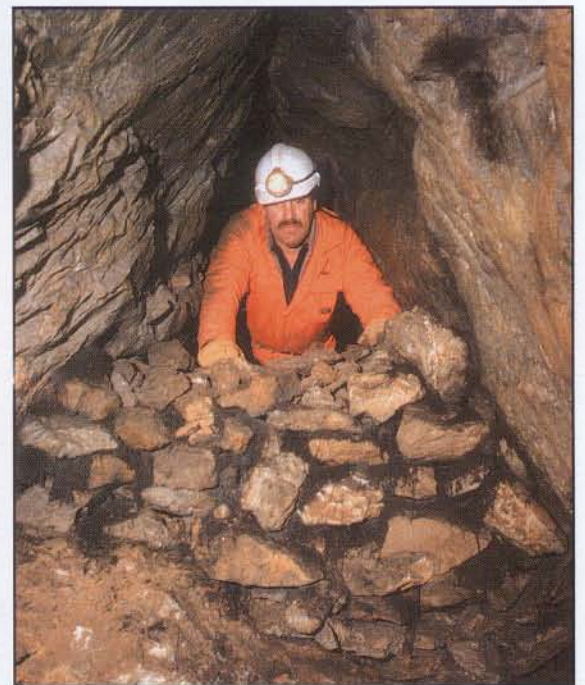
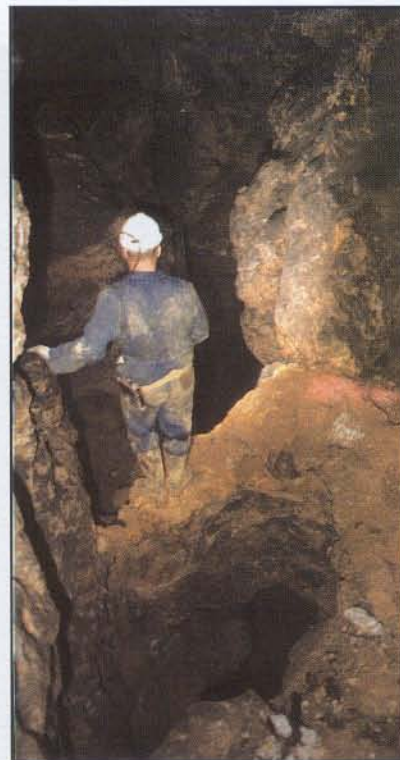
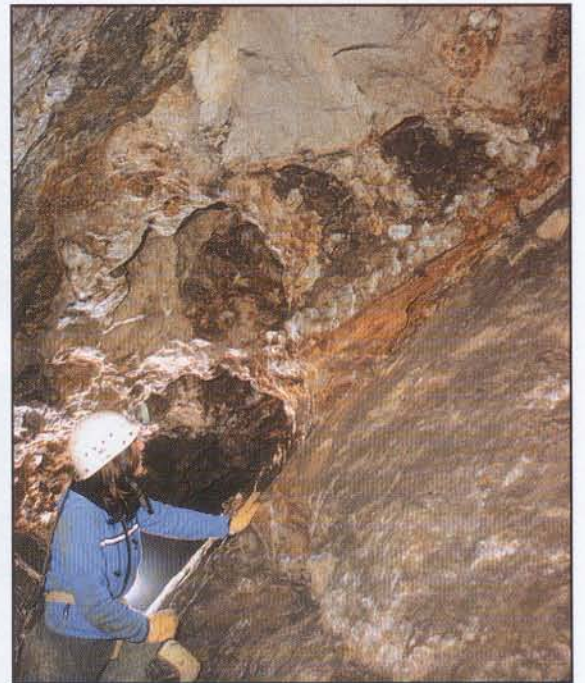
*Plate 2 (top right): An example of mineralisation in the linking pipe-workings between the upper and lower pipe chambers (Photo by Dave Webb).*

*Plate 3 (centre right): An example of woodpecker pickwork in the roof of one of the linking pipe-workings between the upper and lower pipe chambers (Photo by Dave Webb).*

*Plate 4 (bottom left): The narrow linking pipe-workings between the upper and lower pipe chambers, now partly filled with buddling waste, still in-situ to right and cut through to left (Photo by Dave Webb).*

*Plate 5. Bottom right): detail of buddling sediments cut through by later miners in the linking pipe-workings between the upper and lower pipe chambers (Photo by Dave Webb).*





Vein, which was freed in September 1674, was in work from the main Lower Nestus chamber westwards. When the Nestus miners reached a point close to the intersection with the adjacent but now inaccessible natural cave of Bacon Pipe, they found that another company working from Bacon Pipe had already extracted a significant amount of ore from the vein. The Lower Nestus pipe and associated vein workings appear to have largely been worked out by about 1700.

The deep shaft descending from the floor of the main chamber was possibly sunk in the mid 18th century as, though Wragg Sough which it probably intersects, was started in the late 17th century, it was not extended to below this point until the 1730s (Jim Rieuwerts, *pers. comm.*). If of this date, it may have been sunk as a ventilation shaft for the sough. However, this interpretation should be treated with some caution, since, it could be argued the shaft has an atypically-small cross section for such an ambitious shaft of this period. It would have been easier to sink if somewhat larger, and the small size may thus suggest a somewhat earlier date. If it was sunk in the late 17th or early 18th century, prior to the sough extension, its exact purpose remains obscure. The dumping of toadstone clay and limestone from the shaft into the main chamber suggests this had been worked-out at the time the shaft was sunk.

The adit now used as the show-mine entrance was not created until shortly before it opened to visitors in 1810. Documentation shows it was nearing completion in October 1804 when the mine was sold due to debt, its original purpose being to provide easy access for a doomed attempt to rework the pipes for calamine. The possibility that the calamine was worked earlier should not be discounted as entries for this would not be recorded in the Barmaster's books. Copper smelters and brass works were established in the late 17th century by Thomas Patten, followed by further works owned by Charles Roe at Macclesfield in the mid-18th century (Hodson 1978, p164) and there were late 18th and early 19th century "calamy works" nearby in both Bonsall and Cromford (Farey 1811, p406). The mine was sold again in 1808 and the level completed shortly afterwards to provide visitor access. Intermittent small-scale lead mining continued in the Nestus title until 1863.

It seems likely that the cutting through of fine ore-processing silts found during recent exploration represents a re-opening of the lower pipes in the mid 17th century to test whether there were mineral deposits worth working. This in turn led to the discovery of the main chamber and work in Nestus New Breck Vein. The recently opened shaft that leads here was at the very end of the pipe-workings above, the adit not having been driven at this time. It may well be that this shaft was created as a ladderway into the lower workings, avoiding the constricted access passage 17th century miners had explored earlier. The shaft that enters the top of the main chamber was sunk in

**Plate 6 (top left):** *The main Lower Nestus chamber looking south-east from near its upper end (Photo by Paul Deakin).*

**Plate 7 (bottom left):** *Looking north-west from the upper part of the main Lower Nestus chamber (Photo by Dave Webb).*

**Plate 8 (bottom centre):** *The bridge in the upper part of Lower Nestus chamber (Photo by Dave Webb).*

**Plate 9 (top left):** *The top of the deep shaft thought to descend to Wragg Sough (Photo by Paul Deakin).*

**Plate 10 (centre right):** *Hadging workings within Nestus New Breck Vein (Photo by Paul Deakin).*

**Plate 11 (bottom right):** *Drystone wall sealed with moss near the run in shaft as the eastern end of accessible workings in Nestus New Breck Vein (Photo Paul Deakin).*

around 1670 after the discovery of the main chamber and was probably designed to be used exclusively for hauling ore to surface. The possibility also cannot be discounted that some of the small areas where powder was employed that have been identified in the connecting pipe-workings also date to the second half of the 17th century; one of the earliest uses of powder in the region is documented as having taken place in Bacon Pipe in 1676 (Flindall and Hayes 1976; Barnatt et al. 1997). However, while this may be the case in the two instances noted above with small shot-holes, it seems equally or more likely that these are the result of slightly later trial work, whilst trials using somewhat larger shot-holes found elsewhere in the workings are probably 18th to early 19th century in date.

#### ACKNOWLEDGEMENTS

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