

## LANDSLIP CAVES OF THE SOUTHERN COTSWOLDS

by

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### ABSTRACT

This paper gives a brief description of the natural caves that have been formed by landslipping in the Cotswolds near the city of Bath. The paper includes sites that have previously been published, new data from these sites, as well as several new sites. Plan surveys of the main caves are presented.

### INTRODUCTION

This paper is an overview of the natural caves that have been formed by cambering of the middle Jurassic Oolitic limestones in the region to the east of Bath. Such caves are termed "gulls" and form by bed-over-bed sliding and the opening of joints, rather than by physical or chemical erosion. The near-surface beds of limestone are often relatively undisturbed, movement having taken place within the rock sequence. This allows the caves to have solid rock roofs and prevents the ingress of surface-derived material. There is no evidence for any of the passages being aligned along faults, and there are theoretical reasons (a major line of weakness cutting through the roof beds) why faults are less likely than joints to remain air-filled after mass movement. Where the two walls of a joint are vertically displaced, there is often clear evidence of cambering. For a technical appraisal of gull caves, the reader is referred to Hawkins and Privett (1981) and to Self (1986, 1995).

The term "Southern Cotswolds" is not an officially recognised geographical area, but has been devised by the authors for their own convenience. The caves described here are all located in the valley of the River Avon as it cuts through the Cotswold escarpment to the east of Bath, or on the flanks of tributary streams which join the River Avon downstream from the scarp face. For all practical purposes, this region is the outcrop of Oolitic limestones lying south of the M4 motorway. The Cotswold Hills become increasingly indistinct as one travels further south and eventually they merge with the hilly terrain of the eastern Mendip Hills. The "Southern Cotswolds" therefore extend from the M4 motorway to the Mendip Hills, though the authors have no record of gull caves in the most southerly part of the region south of Bradford-on-Avon.

The earliest recorded exploration of a Cotswold gull cave is thought to have taken place in the year 1698, after a team of oxen broke through the roof of a cavity when ploughing a field (Atkyns, 1712). The cave was located in the parish of Cold Ashton and several people were let down into it with candles. The entrance was later covered over to prevent accidents and the precise location of the cave forgotten. Most of the known caves of the Southern Cotswolds are located in small quarries, so it is likely that they were first explored by stone miners. Some mines date back to Roman times, but extraction of stone on a major scale did not begin until the 17th Century (Price, 1984).

Cavers have been interested in the "Southern Cotswolds" since at least the 1920's. Our own Society published an archaeological report on Guy's Rift near Slaughterford (Hewer, 1926), which contained early Iron Age human remains. The authors have no other early

references to Southern Cotswolds caves until the 1960's, when significant research was carried out by the Axbridge Caving Group and Archaeological Society (Tucker, 1964a and b, 1965a and b). This work is extensively reappraised in this paper. Brian Hawkins of Bristol University Geology Department published two reports on the area from an Engineering Geology perspective (Hawkins and Kellaway, 1971; Hawkins, 1980), though his most important contribution was a genetic model of gull cave development, based on a study of cambering in Liassic rocks (Hawkins and Privett, 1981). The authors of this present paper became interested in landslip caves during the 1980's, particularly in a cave near Bathford known as Sally's Rift. Two papers were published as a result of this work (Self, 1986, 1995). More recent work by the authors is published here for the first time.

## THE CAVES

The caves are described in order from north to south; when caves have a similar latitude, the more westerly is described first. Since the caves often occur in groups, the descriptions are also grouped together. The nearest town or village gives the title to these groups. Note that the order of appearance of caves in the text depends on the location of the most northerly (or westerly) cave in each group, not on the grid reference of the nearest town.

This same scheme is reflected in the location map (Figure 1), where each marked site refers to several caves. The authors acknowledge the inconvenience of this scheme, but the few caves that are more widely known by their own name have surveys presented in this report. These surveys include both the popular name and location name in their titles.

### *Colerne Barracks*

Bury Wood Cave no. 1	NGR. ST 8162 7397	Alt. 142 m.
Bury Wood Cave no. 2	NGR. ST 8183 7376	Alt. 142 m.
Bury Wood Cave no. 3	NGR. ST 8198 7413	Alt. 132 m.

Bury Wood Camp is an Early Iron Age hill fort located 3 km to the north of the village of Colerne, but only about 1 km north-east from Colerne Barracks (a former RAF airfield and base). The fort lies on a promontory at the junction of the Doncombe Brook and the Sewell Brook, which combine and flow north-east to join the By Brook. A double ditch with earthwork banks protects the south-western approach to the hill fort. Superficial and tiny quarries have exposed the bedrock in the inner ditch. The best approach is from the south-west by means of public footpaths.

Cave nos. 1 and 2 are located at the north-west and south-east ends of the ditch respectively. They were described by Tucker (1965a), but some discrepancy exists between his description and what can be seen today. Tucker describes cave no. 1 as 6 m long with a narrow slot beneath; the authors found a cave 3 m long (orientation 68°) with a floor of leafy infill. A nearby solution tube is very much smaller than claimed by Tucker and is merely a drainage channel for local rainfall.

From Tucker's description, cave no. 2 begins as a small chamber from which a rift descends for 2.5 m. A narrow passage can be forced for "a few feet" in both directions giving a total of about 12 m of passage altogether. The authors found a small mined entrance chamber

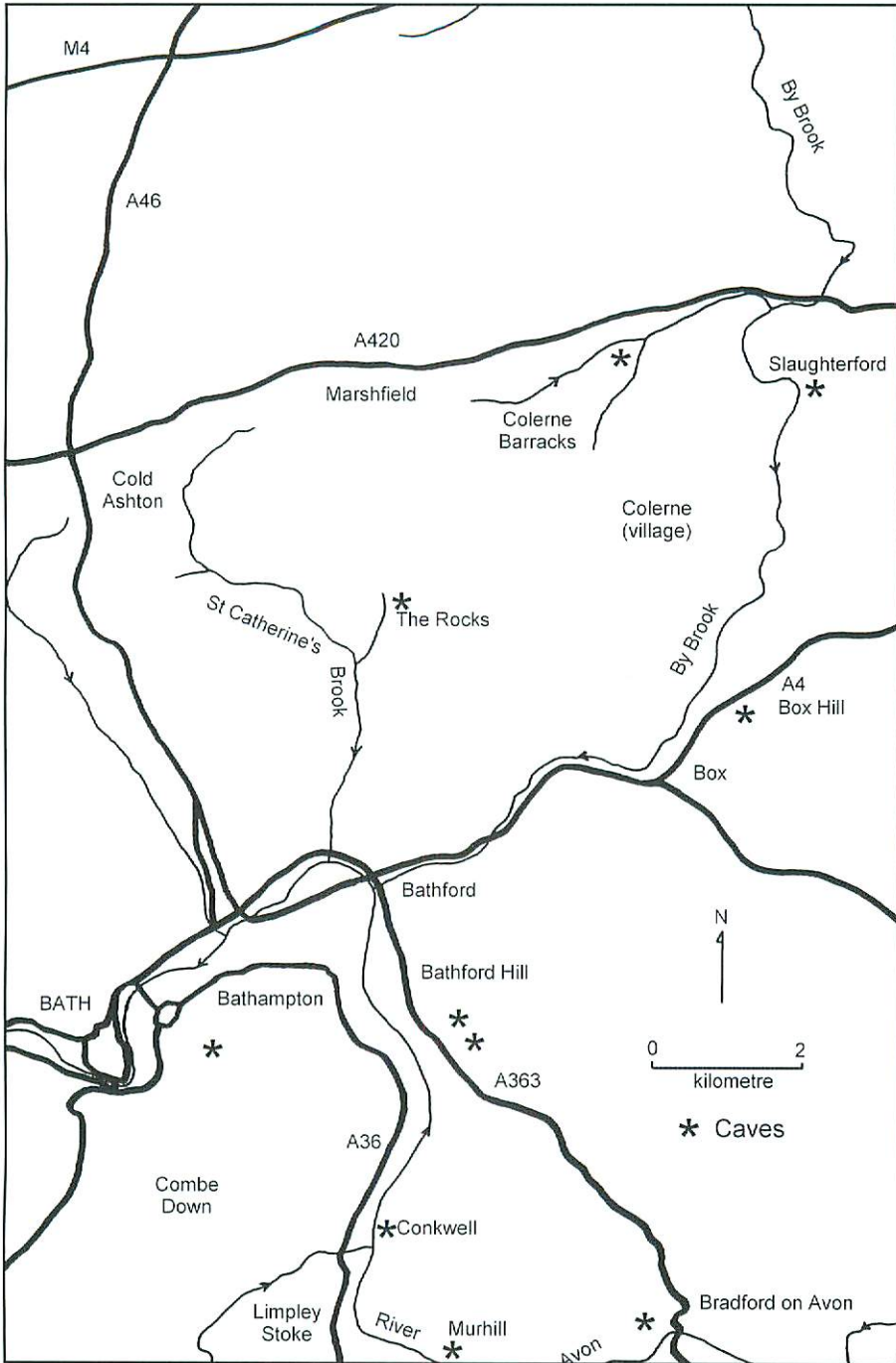


Figure 1. Area map of the Southern Cotswolds, showing cave locations.



with a stony floor, from which a gull (orientation 72°) is passable for a mere 1 m to a narrow cross joint (orientation 160°). These rifts seem too narrow to descend, though on a cold winter's day a strong draught of warm damp air was ascending from them.

Cave no. 3 is described by Tucker as being in the central area of the camp, having been exposed by an archaeological cutting; a boulder-filled rift concealed a small grotto with speleothems. King (1961) describes these excavations, which were made not in the central area but across the north-east entrance to the camp. A rift of perhaps 5 m length was found in the "central area" of this cutting. The site was back-filled by the archaeologists.

Nearer to the village of Colerne, Tucker (1965a) describes a small quarry at ST 813 725 with an obvious fissure which can be seen from the road (from The Shoe to Colerne). It was blocked with boulders "only a few feet in". There is no sign of a quarry at this grid reference. There are some small quarries at the head of the Sewell Brook, 200 m to the south-east, but there are no open fissures; in the most easterly of these quarries, at ST 8163 7247, there is a stone mine with an obvious boulder-filled gull beside the mined entrance.

### *Slaughterford*

Guy's Rift

NGR. ST 8450 7372

Alt. 118 m

Guy's Rift is located high on the east bank of the By Brook, about 500 m south-east from the church in the village of Slaughterford. From the southern end of the village, the road on the east side of the river soon turns an abrupt right-angle bend. It is possible to park a car here. From this bend, a footpath and a bridleway (both signposted) leave in an easterly direction. The footpath climbs the hillside, then turns south-east to follow the edge of a field above a wooded scarp. Quarried cliffs at the top of these woods (Cloud Quarry) contain the cave entrances.

A detailed report has already been published on this site (Hewer, 1926), with an analysis of the archaeological material found here. The remains of four human adults and three children were excavated from the Main Rift, together with a few pot sherds and a large quantity of animal bones. The pottery was identified as early Iron Age. However, the survey accompanying Hewer's report is inaccurate: the presumed connection of Main Rift directly to the skylight passage is erroneous. Tucker (1965a) also reported briefly on this site, describing the Main Rift as Guy's Rift and the other passages as a separate cave. Mockford and Male (1974) describe the passages from each entrance separately, with estimated lengths, under the title "Cloud Quarry Caves"; they include some nearby mined passages in their report. None of these reports give a clear or accurate impression of the cave.

The authors visited the cave during the winter of 1998 and surveyed it in 1999. The entrance to Main Rift is impressive. A tall rift of perhaps 7 m height and 0.5 m width may be entered by climbing and can be followed easily, with a rising floor, for 15 m. On the survey (Figure 2), the passage appears to be perfectly straight but irregularities in the jointing prevents daylight from reaching beyond about 10 m. It was in this region that archaeological remains were found. Beyond 15 m, there is a marked narrowing of the rift which the authors, like the explorers of the 1920's, declined to attempt. Scuff marks on the walls suggest that further progress may be possible. The authors established a voice connection to a region of recent collapse in a neighbouring rift (see below).

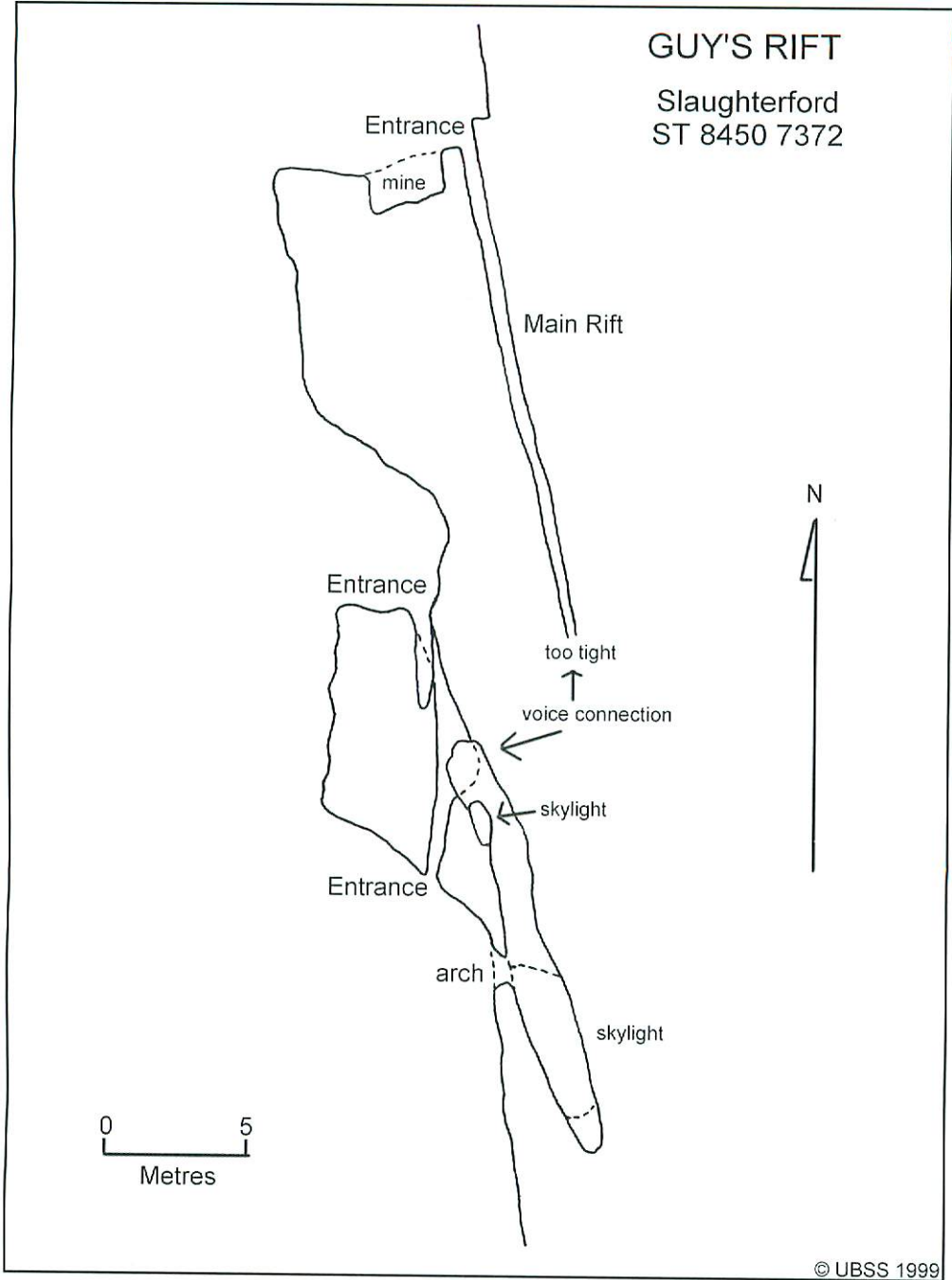


Figure 2. Plan Survey of Guy's Rift.

Fifteen metres south of the entrance to Main Rift, a second gull cave is seen. This cave has opened in the block of rock on the valleyward side of Main Rift, and consequently the strata are much more disturbed. The upper level of this gull soon closes down, while a narrow and awkward connection at floor level gives access to a more pleasant passage that soon leads back to the hillside. Halfway along this passage, a region of recent collapse on the side of the passage gives a voice connection to Main Rift. (In 1998, there was a passable route through these boulders which the authors declined because of a group of hibernating bats. By the time of our survey visit in 1999, considerable change had occurred.) A visual connection upwards through boulders from this point links to the northern end of another rift passage, characterised by large skylight openings; access to this rift is via a rock window in the side of the largest skylight. The skylight rift ends to the south in cemented infill. The visual and vocal connections between different passages prove that this is all one cave. Scuff marks at the end of Main Rift suggest that persons of a small build may once have squeezed through to other parts of the cave. Since the recent movement of boulders in the central “knot” point, this is no longer possible. The surveyed passages total 42 m, giving a grand total of about 50 m if the “voice connection” is included.

Some mystery surrounds the human remains found in Main Rift. They did not fall into the rift from above, yet there was no evidence of deliberate burial. Their location at the present limit of daylight is purely fortuitous, since in Iron Age times the rock outcrop extended much further into what is now Cloud Quarry. Main Rift would have been considerably longer, though it is possible that access was from a skylight (now destroyed by quarrying).

### *Cold Ashton*

Cold Ashton Cave            (Cave lost, exact location unknown)  
(Cold Aston Cave)

The original reference to this cave is in Atkyns (1712):

“About 14 years since in this Parish [i.e. about 1698], as a Person was plowing with Oxen, one of the Oxen faltered in a Hole, which when the Earth was removed from it, appeared like to the Tun of a Chimney, through which several Persons have been let down, where they found a *Cavity* in which one might walk above half a Mile one way, and it is not known how far the other; and as they walked with Candles, they observed several such Tunnels ascending towards the surface of the Earth.”

This description is reprinted in Rudder (1779), with the following addition:

“It is not said what depth or what figure this cavity was of, particulars which might have given some light as to the use of it. Being on the spot, I was informed that the passage was from north-east to south-west, but the holes were all carefully stopt up to prevent accidents, so that I could not descend to view the place myself.”





Each rift is generally narrow and of only a few metres length. The most interesting feature of Henry's Hole is a mined passage with a solid rock roof which passes underneath a gull rift; this indicates complex movements within the rock sequence. (Usually in Southern Cotswold gulls, the basal plane of movement is assumed to be the lithological boundary with the underlying Fuller's Earth clays). This gull cave *cum* underground quarry is described in detail in Self (1986).

The Box Freestone Mine is a vast labyrinth of mined passages with several entrances. The grid reference given is for Backdoor. A detailed survey has been published by the Shepton Mallet Caving Club in three sheets (Neads, 1990, 1992, 1994), though earlier surveys and many other references to the mines can be found. Near Cliftworks Passage, which runs from the gated Clift Entrance, there is an unstable and seldom visited region known as the Natural Rift Series where a gull can be followed, both to the north-east and to the south-west, for a total distance of about 50 m. Other gulls are known in the northern part of the mine, near the Iron Door and at the far end of Windy Hall (C. Smart, *pers. comm.*).

In the southern region of the mine, accessed from Jack's Entrance, evidence of gulling can be seen every 10 m or so. These gulls are open cracks across the ceiling and walls of the mine, usually narrow, though a wider gull is known to be passable in the most southerly part of the complex. Gulls located more than 150 m from the hillslope tend to be solidly infilled (the "hillslope" being taken as a line joining the many entrances to the mine). The Box Mines are mostly used for recreational purposes, but they offer a unique view of the extent to which mass movement has affected an entire area of cambered hillside.

### *Bathampton*

Bath University Fissures

NGR. ST 7677 6452

Alt. 173 m

Bathampton, part of the City of Bath, lies to the east of the city centre and south of the River Avon. Bathampton Down is a grassy upland overlooking Bathampton and is best known for the University of Bath, which is located here. The western approach road to the University of Bath, known as Quarry Road, is an excavated cutting through Great Oolite strata. Numerous open gulls can be seen in the cutting sides, but none are currently accessible. The gulls appear to have been infilled during the building of Quarry Road, and are too narrow to be entered at the level of the cutting walls. On the west side of the entrance to Quarry Road, set back from the road, there are two slightly wider gulls which become choked after 2 m. The orientations of the gulls on Bathampton Down are very varied; north-west is a common direction, as is slightly east of north.

The Engineering Geology of the Bath University site is described by Hawkins and Kellaway (1971) and by Hawkins (1980). In the former paper, the authors note that large gulls were seen during the construction of reservoirs on Bathampton Hill in 1955. When a second set of reservoirs were built in 1969, "these showed large caverns, pipes and swallow holes, some having been developed by the differential solution of individual limestone bands". Hawkins has confirmed (*pers. comm.*) that these "caverns" were horizontal features, not gulls with corroded walls. (Solution features on the walls of gulls are quite common in the Cotswolds and are due to groundwater movement prior to gulling.)

Open gulls were exposed in the Springfield Quarry area of Bath (Hawkins, 1980), located just to the north of Combe Down at ST 748 625, when a housing development was built



around the old freestone workings. The quarry itself has now been converted into a municipal park, but the many gulls that can be seen in its cliff walls have been efficiently blocked by the City Council.

### *Bathford*

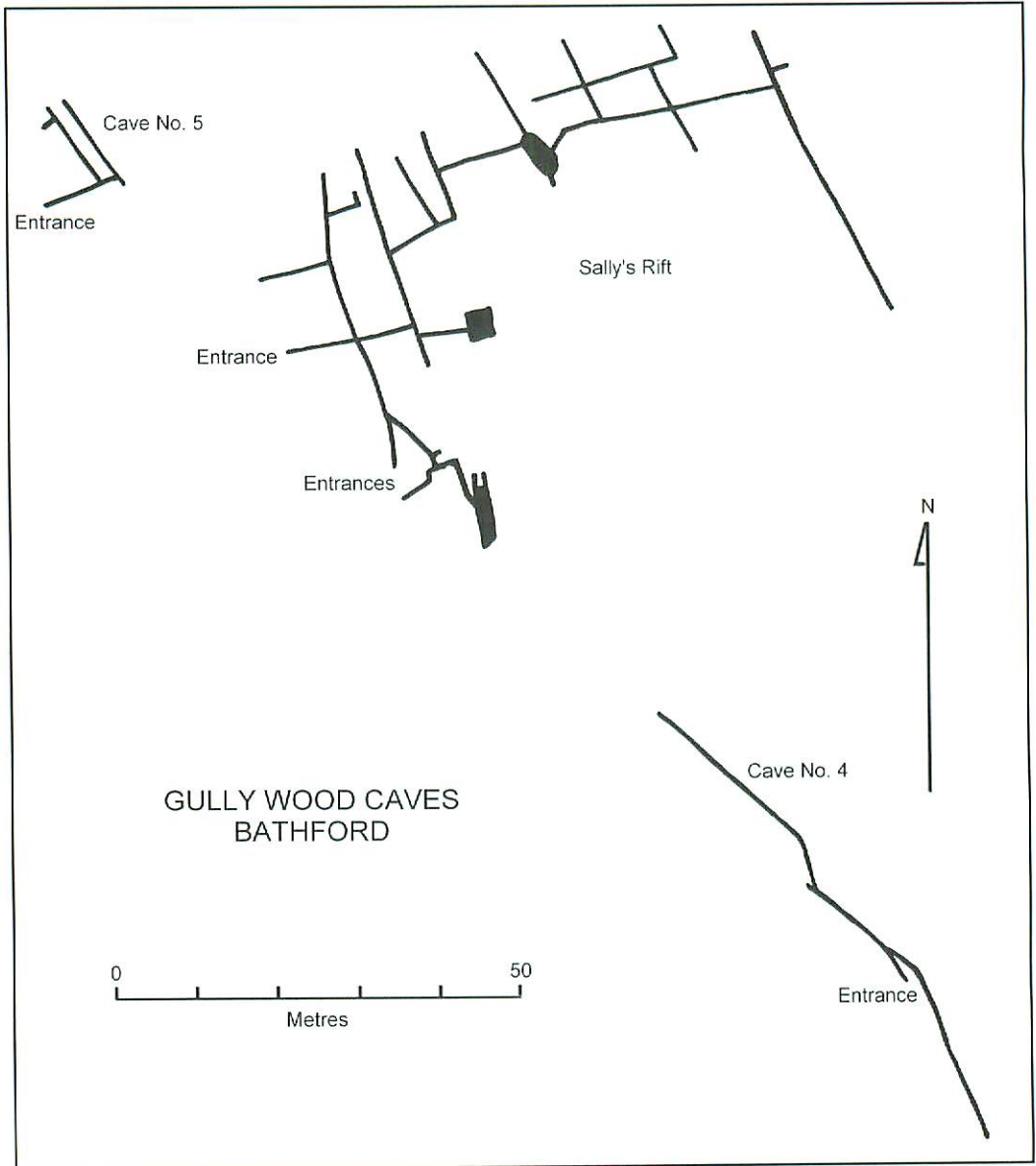
Gully Wood Cave no 5	NGR. ST 7937 6600	Alt. 156 m
Sally's Rift (Gully Wood Caves nos 3 and 3a)	NGR. ST 7941 6506	Alt. 160 m
Gully Wood Cave no 4	NGR. ST 7946 6500	Alt. 162 m
Gully Wood Cave no 1	NGR. ST 7970 6459	Alt. 145 m

The village of Bathford lies on the south-east side of the junction of the River Avon with the By Brook, its most important scarp stream tributary. The Great Oolite limestone rises above the village as a prominent escarpment and is riddled with stone mines. The best known of these is the very extensive Brown's Folly Mine, whose entrance overlooks the Avon valley less than 1 km south from the village. The smaller Swan Mine lies to the east of the village overlooking the By Brook. Both these mines are known to contain gulls, but the authors have not searched them for natural passages of passable size. It seems probable that in this part of the Cotswolds, all stone mines which have their entrances on valley sides will have gulls crossing the mined passages. It is quite likely that occasional gulls of the dimensions of the Natural Rift in Box Freestone Mine will be found.

The longest natural cave in the Cotswolds (and the second longest gull cave in the British Isles) is located on Bathford Hill, with its entrance overlooking the valley of the River Avon about 1 km south of Brown's Folly Mine. Sally's Rift has 345 m of passages and has been extensively documented by Self (1986, 1995); readers are referred to these papers for a more detailed description. The first part of the cave was explored by Tucker (1964b, 1965a and b) and named Gully Wood Cave no. 3. His entrance no. 3a was connected to the main cave by the authors of this paper in 1985.

The Gully Wood caves are best approached from the main road which goes from Bathford to Bradford-on-Avon. The road climbs steadily from Bathford and, after about 2 km, a long lay-by is seen on the left side of the road. Steep woodlands rise above the lay-by, but after only 50 m a footpath is reached which contours the hillside. Head left (north) along this footpath for 100 m then go directly uphill through thorny undergrowth. The small cliff below the skyline contains three entrances to Sally's Rift. The middle entrance is normally used, its distinguishing feature being that its rift entrance is aligned parallel to the cliff face.

From this entrance, a short crawl then a chimney climb down leads to the massive Main Rift passage. Sally's Rift is a network cave and a complex route must be followed to reach the well-decorated Far Rift, which runs parallel to the hillside but 70 m from the hillside edge. The roof of this passage is perhaps 20 m below ground surface. The caving is strenuous and involves several climbs and a short ladder pitch. Flowstone from Far Rift has been radiometrically dated by the Geography Department of Bristol University, giving ages in excess of 350,000 years. Solutional etching of the walls of gulls oriented north-west/ south-east suggests early groundwater movement in this direction before the present valley of the River Avon was established. This gives credence to the view that a proto-River Avon captured the water of a proto-River Thames which once had its headwaters on the eastern Mendip Hills (Self, 1995). At two points within



**Figure 3.** *The Gully Wood Caves, Bathford.*

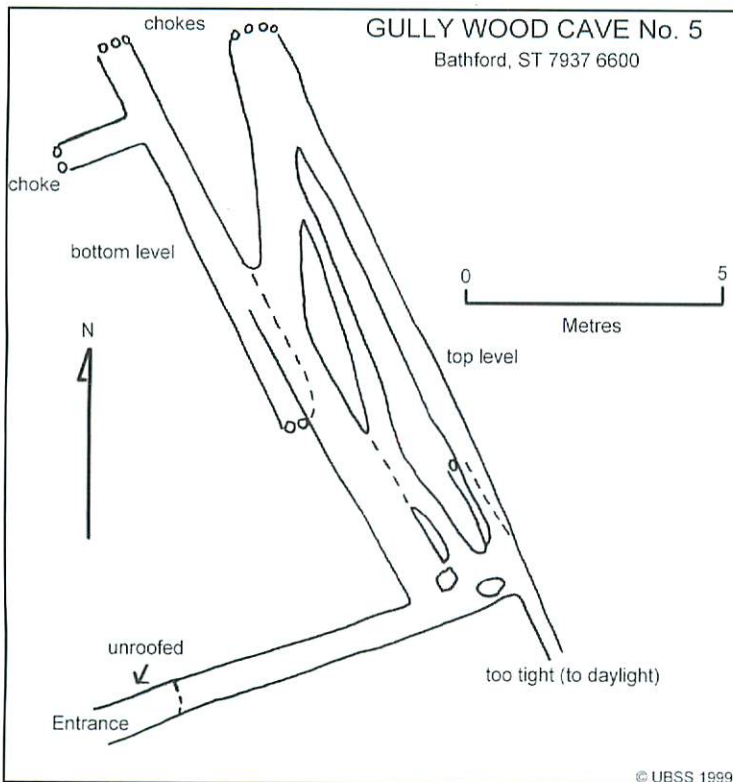
the cave, a Pleistocene deposit of "clay with flints" (a plateau gravel) has entered via narrow side fissures to the main passages. These side fissures must connect to the surface.

The entrance to Gully Wood Cave no. 5 lies 55 m north-west of Sally's Rift, where the hillside turns abruptly to a more northerly direction. The cave is easily located, so it is surprising that it was not mentioned in any of Tucker's reports. The entrance passage is unroofed for the first 2 m, then leads easily in a north-easterly direction to a region of bouldery breakdown. A



wriggle at low level leads to a conjugate north-westerly rift, while ahead between boulders another north-westerly rift is soon reached. To the right, an inaccessible chink of daylight can be seen. The region between these north-westerly rifts has foundered to produce a complex of possible routes on four levels. The surveyed distance from the entrance to the end of the cave is only 20 m, but the addition of alternative routes allows for a total estimated length of 50 m.

The entrance to Gully Wood Cave no. 4 lies 90 m south-east of Sally's Rift, in the north wall of a small box chamber cut in the rock by stone miners. A narrow rift leads directly to



**Figure 4.** *Gully Wood Cave No. 5, Bathford*

narrow at high level. The total surveyed length is 95 m. The slightly different orientation of the north-westerly rifts in Sally's Rift, compared with both Gully Wood Cave nos. 4 and 5, was checked and found to be correct.

Gully Wood Cave no. 1 is some distance from the other Gully Wood caves, lying a little over 500 m south-east of Sally's Rift. The cave is a mere 12 m long (orientation  $165^\circ$ ) and was reported by Tucker (1965a). The cliff line is much nearer the road here and, somewhere close to cave no. 1, Tucker (1965a) described Gully Wood Cave no. 2, length 10 metres. The authors have not found this site. A conspicuous entrance can be seen near a public footpath, about 200 metres north of cave no. 1. This site, which is marked "Cave" on both the 6 inch and 25 inch series Ordnance Survey maps, is a mined chamber. A gull 1.7 m wide crosses the chamber, but it is entirely filled with consolidated stony debris.

a pitch of 5 m, at the foot of which a spacious and gently meandering rift can be followed to the north-west for 50 m. This part of the cave was explored by Tucker (1965b). There are no significant side passages and the rift ends when it becomes choked with boulders. Just before this point, a small deposit of plateau gravel has entered the cave from a narrow side fissure. To the south-east from the entrance pitch, a crawl over rubble enters a bouldery chamber beneath the floor of the mine. A climb down into a rift leads to a further climb down into a very narrow rift, which becomes choked at low level and too

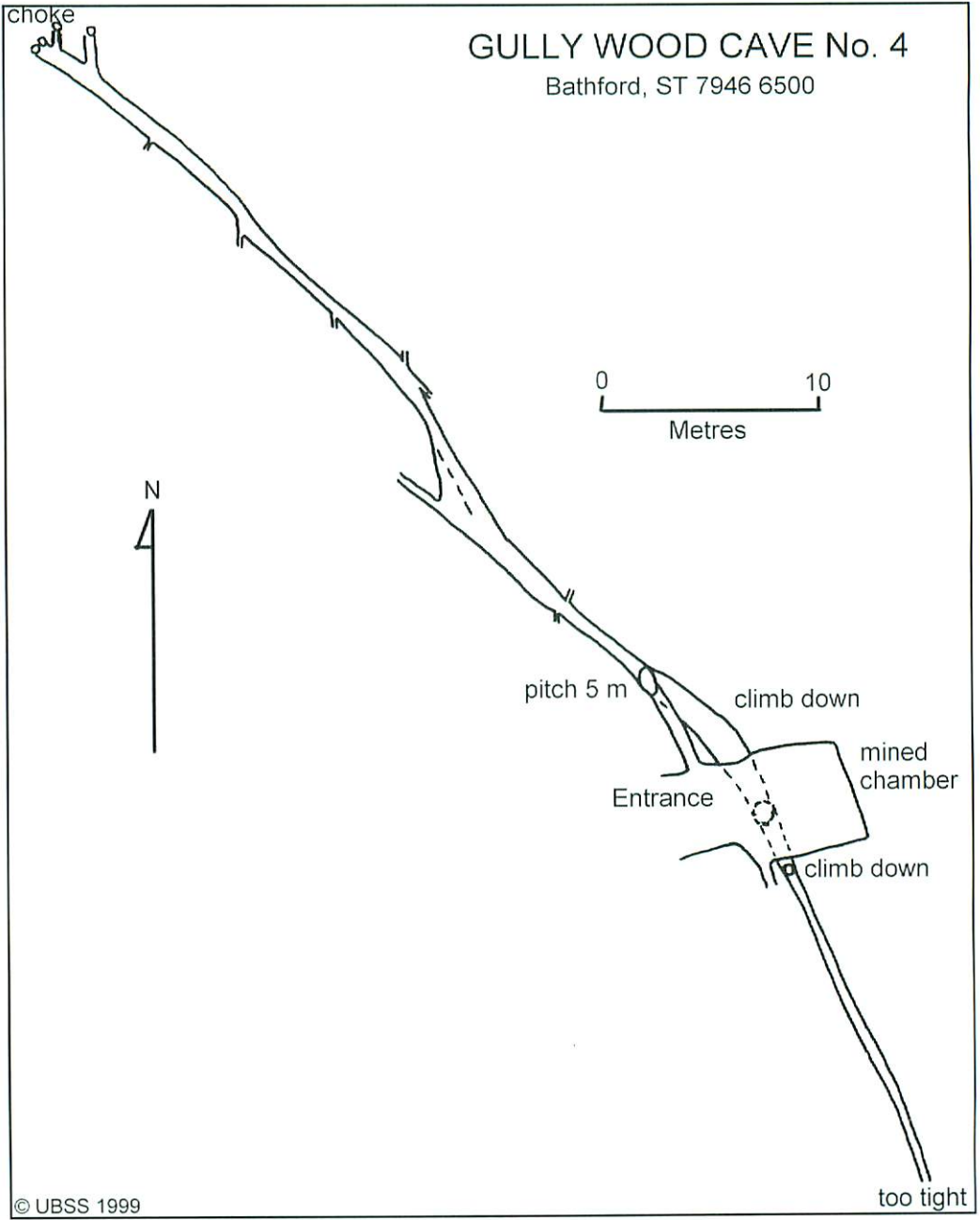


Figure 5. Gully Wood Cave No. 4, Bathford



*Conkwell*

Conkwell Cave no. 1	NGR. ST 7909 6238	Alt. 148 m
Conkwell Cave no. 2	NGR. ST 7907 6232	Alt. 148 m

The Conkwell Caves are located in the middle part of the Claverton Gorge, high on the east side of the River Avon and about 1.5 km north north-west of the village of Winsley. A small quarry can be seen close to, and on the opposite side of the road from, Conkwell Pig Farm. Cave no. 2 is located in the tallest part of this quarry and was dug open by the authors in 1998. From the narrow entrance, a climb down of 4 m gains a rift passage heading north for 6 m, with a short side passage on the right.

Brian Prewer (*pers. comm.*) remembers a far more substantial cave at Conkwell, of perhaps 200 m length, which he visited during the early 1950's (Conkwell cave no. 1). The entrance lay some tens of metres north of cave no. 2, directly opposite the farm entrance. However, new buildings were erected at the farm during the 1950's and a large amount of site debris was dumped over the part of the cliff containing the cave entrance. No sign of a cave now remains. The cave was of the network type, with a region of breakdown in the middle part; some passages were on two levels, divided by breakdown.

*Murhill*

Murhill Rift	NGR. ST 7956 6073	Alt. 110 m.
Murhill Mine	NGR. ST 7958 6072	Alt. 110 m.

The direct route from Bath to Bradford-on-Avon crosses the River Avon just to the north of the village of Limpley Stoke. From the Avon valley, the road climbs in an easterly direction up a long hill to the village of Winsley. About half way up this hill, a minor road leaves to the right and traverses the hillside to the tiny village of Murhill. At Murhill, there is only one obvious place to park cars; Murhill Rift and Murhill Mine are very close to this parking place. The two sites lie close together in a small quarry in woodland on the uphill side of the road.

Murhill Rift has been known for a long time, but no description has ever been published. The cave is currently being explored by the Cerberus Speleological Society (CSS), but details have not yet been made available. The authors of this paper surveyed the cave as far as a muddy horizontal squeeze. The total surveyed length (which does not include separate high level or low level routes) is 96 m. It is to be hoped that a fuller account will be published by the CSS.

Murhill Rift has two entrances, of which the one to the east is usually used. A short crawl gains a narrow rift which leads east to enter a large bouldery passage. Ahead, a rising passage to the east soon ends at a choke, while a second passage on the right ends at a cross rift. The way to the rest of the cave is on the left (west) by means of a roomy passage whose stony floor slopes downwards. When a massive fallen block divides the passage, a climb up to the left gains a short rift quickly leading south to the second entrance. Staying at floor level, a region of boulders is negotiated to gain a tall rift heading in a more north-westerly direction. A second region of boulders is passed to gain another tall rift continuing in the same direction, the walls

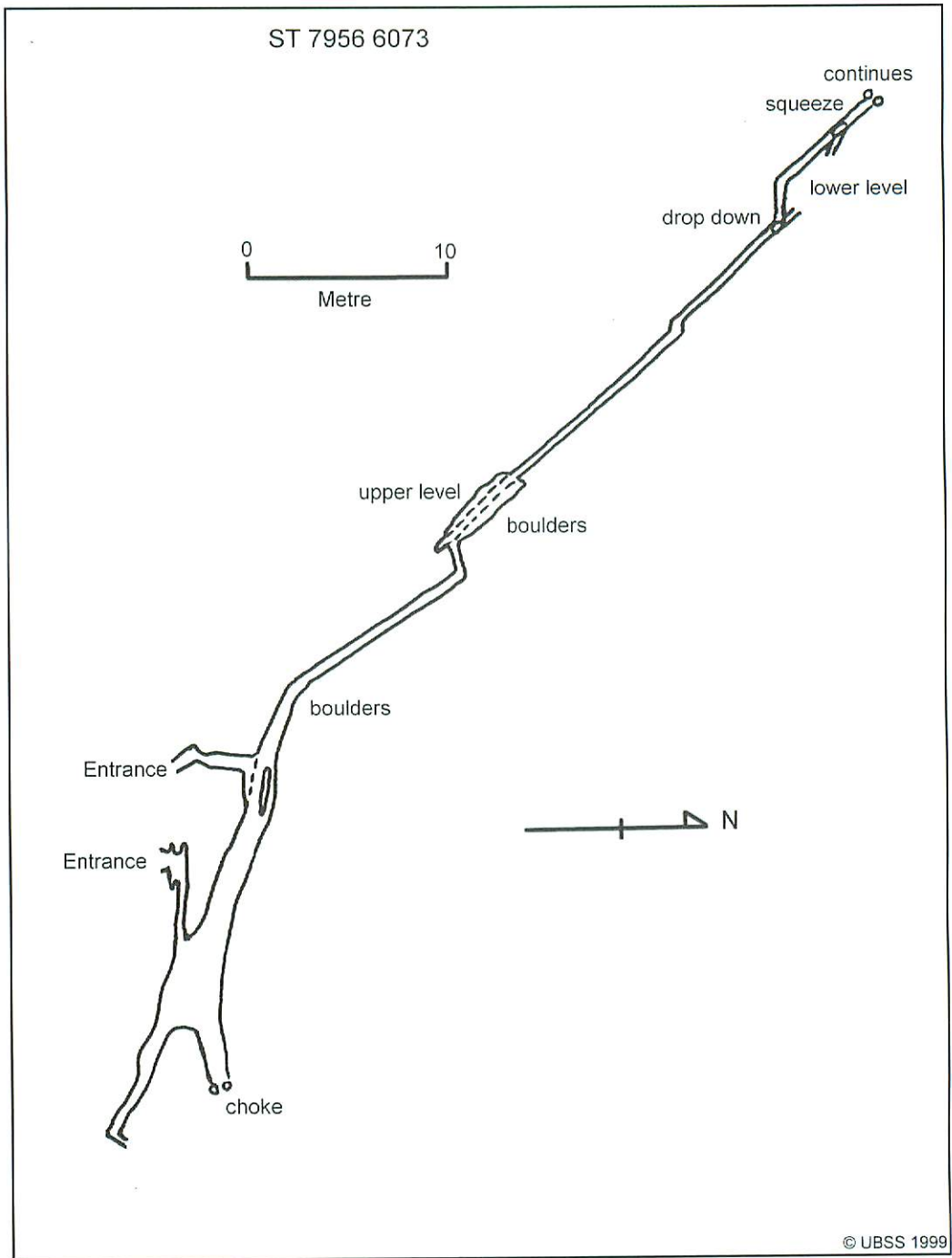


Figure 6. *Murhill Rift.*



becoming increasingly muddy. Solution features and flowstones, originally well displayed in this cave, are no longer visible.

The rift now narrows suddenly and slim cavers can slip down through a smooth-walled slot into a wider part below. From here, a lower level route is seen through a hole in the floor. The normal route climbs back up to the previous level, continuing in the same direction, and passes over another hole down to the lower level. Just beyond this point, the passage becomes partially blocked by a boulder choke. This is the limit of our survey. A muddy horizontal squeeze can be seen at head height. This is difficult to enter and more difficult to pass, as the squeeze turns an abrupt corner to the left. An additional problem is the stickiness of the mud, which is a great hindrance. Beyond the squeeze, the rift turns again to the north-west but soon narrows. Ahead lies another downwards slot, similar but narrower to the one that has already been passed. The authors did not venture further during their single visit to the cave.

Murhill Mine has a large entrance some 20 m south of Murhill Rift. An obvious hole in the floor of the entrance chamber gains the bouldery lower level of the mine. Two substantial gull rifts can be entered from this lower level, but neither can be followed very far. They are both oriented on 115°, which is the alignment of the nearby southern end of Murhill Rift. One of these gulls has solution features on the walls, flowstones and a delightful calcite speleothem formed of re-cemented wafer-thin false-floor fragments.

### *Bradford-on-Avon*

Gorton's Rift                      NGR. ST 8225 6089                      Alt. 65 m  
(Bradford Pit, Wine Street Quarry Cave)

Gorton's Rift is located approximately 400 m west of the town centre of Bradford-on-Avon. There is some uncertainty over its exact location. The rift lies at the end of a mined passage, the mine entrance being located in the "garden" of a house in Wine Street Terrace (a group of houses on the east side of Wine Street, linked by narrow and labyrinthine footpaths). The rift was first explored by the Bristol Exploration Club (Tuck, 1962) and given the name Bradford Pit. The rift was later independently explored by Tucker (1964a, 1965a) and named after the householder. The name given by Tucker would seem to be better known among cavers. Neither report gives the house number in Wine Street Terrace, and Mr Gorton is no longer remembered locally.

The best clue to the location of this site can be found in the report by Tuck, who describes other mine workings in Mr Gorton's garden at the beginning of his report; these workings have distinctive stonework entrances which can be readily identified today. They are best approached from a residential street named Newtown which contours the hillside. At the junction of Newtown with Wine Street a large building, named The Old Brewhouse, has been converted into flats. A footpath, signposted St Mary, Tory, climbs steeply up the hillside to the right of the flats. Mine workings are immediately seen on the uphill (north) side of the footpath, set in steep ivy- and scrub-covered wasteland. Having described these mines, Tuck's report continues: "Another reconnaissance revealed, behind what appeared to be a well strawed but roofless stable, a working of considerable dimensions ...". It is this working which contains Gorton's Rift, but the authors of this paper failed to find it. The grid reference and altitude that we quote refers to the other mine workings, which we presume lie close to Gorton's Rift. Of

note, the grid reference quoted by Tucker indicates a point 100 m to the north, while that of Tuck lies 400 m to the north.

The following description is based on the published reports of Tuck and Tucker. The mine extends to the north-east for about 180 m and ends where a natural rift appears as a gash along the length of the floor. (This is the same general orientation as the hillside). From the level of the mine, the rift is 21 m deep and requires a little less than this amount of ladder to descend. Several false floors of bouldery debris must be passed in the upper part of the pitch, while the lower part is smooth-sided and quite narrow. From the bottom of the ladder, a short passage descends a further 3 m. The foot of the rift is passable for only a short distance in either direction, while at about half height the rift can be followed for about 10 metres along a false floor. Above and slightly offset from the ladder pitch, the rift can be seen to continue upwards, giving a total depth of around 27 m. According to Tucker, the top of the rift reaches to within 3 m of the ground surface. Gorton's Rift is almost twice as deep as any other natural cave in the Southern Cotswolds area. Despite its limited horizontal extent it is a very significant site, possibly extending down close to the lithological boundary with the underlying Fullers Earth clays. Any information that could help to locate this cave would be welcomed.

## DISCUSSION

The caves described in this report comprise only those sites that are known to the caving community. More are certainly known to local residents and to construction workers who operate in this area. All the sites described here are located on (or very close to) the steep valley sides of the River Avon and its tributaries. This contrasts with the main part of the Cotswolds, further north, where many gulls are associated with the scarp edge. The authors intend to extend their area of study to include the rest of the Cotswolds in future papers. Any information would be most welcome.

Gulls can only form where there is extension of the strata. In the Cotswolds, this is due to cambering and affects both the scarp edge and the sides of valleys. In the Southern Cotswolds region, described here, the scarp edge is not a major feature while the valleys of the River Avon and its scarp stream tributaries are significantly overdeepened. This explains the difference in location of the caves in this report compared with elsewhere in the Cotswolds.

It is difficult to guess how much rock was exposed on the valley sides, before the advent of quarrying. Seemingly, every exposure has been modified by man and the number of small quarries worthy of the name must run into hundreds. If investigated systematically, many more gull caves would be found. What is perhaps surprising is that so few caves are currently known. However, this may be because their entrances are buried by material of surface origin, rather than that they are uncommon. Open gulls are only seen where there has been some excavation (with the noted exception of Guy's Rift, Slaughterford. Even here, it is only the archaeological evidence which proves that the cave was open before the excavation of Cloud Quarry).

From the evidence seen in stone mines, hidden gulls may be present every 10 m or so on every valley side throughout the region. Many will be narrow or sediment-filled, but others will be large open voids. This need not be of concern on safety (slope stability) grounds unless the surface rocks are disturbed by construction projects. According to Chris Smart (*pers. comm.*), The Swan Inn near Bathford has been chained to the hillside in an attempt to protect it from mass movement. The great distance from the hillslope that gulls can still be found (as seen



in Box Freestone Mine) and the depth below the surface where gulls can lie hidden (as seen in Sally's Rift, Bathford) are significant findings which may be of interest to the planning authorities.

The altitudes quoted in this paper have been estimated from Ordnance Survey maps. Since the cave entrances are all located in small cliffs, some minor errors are inevitable.

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## APPENDIX

### Evidence of gulling on Dundry Down

Dundry Down is an outlier of Inferior Oolite limestone, lying approximately 10 km west of the Cotswolds escarpment and some 6 km south-west of the city of Bristol. Geographically and geologically, this outlier is part of our Southern Cotswold region. "Dundry Freestone" was mined in the past, most of the workings being located at the western end of the summit plateau. Agricultural improvement has removed nearly all traces of these mines but for a small area at ST 5523 6658, where one entrance remains open. The outcrop in which this mine is located shows fissuring and part of the quarry wall to the south is covered with calcite flowstone, a typical feature of Cotswold gulls. However, none of the fissures are wide enough to be described as caves (G.Mullan, *pers. comm.*).

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