

SOUTH WALES CAVING CLUB



EDITORIAL

“and from our native valleys we seldom care to roam”

This is the one hundredth edition of the Newsletter, and rather a watershed in the overall hydrology of club development.

For many months now the smaller format club news-sheet has kept people up to date with the various goings on at Penwyllt. The Newsletter will now be produced at least bi-annually on an improved format, of which this edition is the first attempt.

Moreover, the club appears to be resurging in a whole variety of unexpected places, with members currently underground in China, Africa, West Indies, North and South America, Europe, Australia and New Zealand, not to mention the various limestone outcroppings of the United Kingdom. (There is even a weekly SWCC meet in London though the only calcium carbonate there is in the tapwater!)

The 100th edition, therefore, reflects a little of these goings on - many of the other club goings on would probably be libelous or defamatory - however the quality of content is of the expected high standard, and gives a hint of what tales could be told if only some people would learn to write!! More articles please!

Ten years ago, when last I was editor, I eagerly awaited the completion of several articles for the Newsletter. I note that we are still waiting! for the same people! but don't worry, next year's special celebration issue will have a place for articles of an historical nature too, so get writing!

By the way, this summer, having been dragged to the top of the Dachstein by my Austrian mate Siegfried, I sat taking in the view of glacier upon glacier with the whole range of the Alps before me. It was a perfect, crystal clear morning. Another Austrian cramponed and hacked his way up to share our ledge. He looked at my t-shirt “Ah, you are caving zen?” “No, I'm climbing this —— mountain.” “Ha, vere are you at home caving?” “Well, I'm really at home at Penwyllt, South Wales, but our club gets to other places too.” Now, that is a thought! I really **am** at home at Penwyllt. “Ah, zis Pen-wyllt, I would like it there?” I looked out at the whole panorama of the Alps, “Yes, you'd like it. I like it, it's bloody marvellous” and **that** is what the Welsh call hiraeth.

*Cheers!
Gary*

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“DIGGING IN THE GRAND MANNER”

The clockwork cavers strike again! Recent attempts to solve the Blob Hall problem have taken on civil engineering proportions and a shaft was started through what is thought to be about nine metres of solid limestone.

A sharp fall in the international price of tin provided the services of Cornish crew (no weekend overtime!) as well as R.F.O.D. backup. The new pit has no connection whatsoever with the digging of a new cess pit for the club (mind where you step!) To date no cave has been found, but shares in the Cwm Dwr Mine are gaining rapidly on the London Exchange.



CHAIRMAN'S REMARKS

Bob Hall, as the retiring Chairman at last A.G.M. made a speech of which the following is of particular interest for the future.

"We have seen changes in various areas and I think we have 'shaken off' some old attitudes and are the better for it. Looking forward I am optimistic for the future. There have been several good signs in the last year: new cave, new faces, new ideas - indeed we seem about to metamorphose from being a clockwork caving club into a crystal controlled, solid state, multifunction, solar powered, high tech model! I believe that the constitutional amendment to be discussed shortly (qv) could lead to a more open attitude, and a more youthful membership. Although I did not instigate this change I wholeheartedly support it and commend it to you."

"Before concluding I would like to pass comment on one particular area that does concern me - records. I am frequently impressed by the use of the library by members and others wishing to search for information on projects of interest. Our library is a valuable resource. It will only remain so if we keep feeding information in. To this end I enjoin members to:

- a) write up everything that they do in the log-book - this is a tremendously useful primary source of information.
- b) make the effort to record more fully what has happened in our Newsletter.

Please support your new editor and records officer in doing this. "

*Doe clywais, mi geisias gêl,
Dair och ar lethrdir uchel.
Ni meddylw'n, gwn gannoch,
Y rhôlî w'r fyth y rhyw och.
Ni bu i'm gwlad, rhoddiad rhydd,
Na llif cwyn, na llef cynydd,
Na meingorn uwch llethr mangoed,
Na chloch uwch no'r och a roed.*

Dafydd ap Gwilym

This year has seen the welcome arrival of several offspring to various members, and also, sadly, the death of three well-known characters; Gwynne, Oliver and Len.

It is perhaps significant that SWCC is essentially a group of friends rather than a card-carrying membership, and nothing brought this home more than the sense of loss at Gwynne's funeral. Suffice to say that the chapel was not large enough to contain the crowd, and many of us stood in the open to pay our respects. Good natured Gwynne will be missed by us all.

Dr. Oliver Cromwell Lloyd died suddenly at his home in Bristol in May. He was almost legendary for his eccentric dress, puckish humour and support to cave diving. He will be greatly missed by those of us who knew him through U.B.S.S. or C.D.G.

Len Cross will be remembered as one of the warmest of friends. Many novices to caving were helped by Len, mixing a great deal of responsibility with his humour, he shared his love of mountains and caves readily. Len died of a heart attack whilst walking his favourite Welsh mountains this summer.

*We are not wholly bad or good
Who spend our lives under Milk Wood
but Thou I know will be the first
To see our best side, not our worst.*

Dylan Thomas

NORTHERN LIGHTS

Discovery

Bob and I first became interested in this area during Easter 1982 when a promising boulder choke was found leading off from a crawl in the Midnight Series. Several trips were spent trying to move the boulders and eventually 'black' space could be seen through a tight squeeze. This entered an unstable chamber, which, to our disappointment, contained footprints.

We took the obvious way out of the chamber and climbed up a small stream passage to an aven. The passage then doubled back on itself at a higher level through a narrow rift. We had accomplished a 'round trip' as we peered down a 10m climb back into the Midnight Series.

On the following day, accompanied by Brian Clipstone, we returned to the unstable boulder chamber. Above the boulder squeeze a tube was noticed leading down into a larger passage. We proceeded to investigate Lavender Way but progress was halted when a loose boulder wedged itself on the back of my neck. Bob muttered "Well, there's nothing I can do" and continued on the exploration. I was left to muse on the thought of being left in a crumbling boulder choke.

Tales of the subsequent five chambers found were related many times by Bob and the final aven increased in size on each telling.

Two years later, I decided to ascertain the truth of the tale by surveying the passages along with Ivan Wolton. After much grovelling and swearing about surveying, chamber four was reached, but we were baffled by the fifth chamber (not realising that Bob had included the aven in his counting).

Ivan and I spent some time looking around chamber four and eventually a loose 5m climb was spotted. Ivan scrambled up muttering "It's draughting, it echoes, it's getting bigger". SILENCE. I followed as quickly as I could. Surveying was abandoned for the day and we explored Northern Lights as far as the sump. Ivan concluded that perhaps surveying wasn't so bad after all!

Eventually Bob and I returned to Northern Lights. Our main intention was to push the sump but we soon realised that this was too tight. We then returned upstream to look at a small inlet on the north side of the stream passage. After crawling round a right angled bend in a small tube, half filled with water, a small chamber was entered. Bob continued to crawl along the streamway for a further 12 metres and then climbed upwards. I was meant to be watching the water level but happened to glance up and noticed a large passage above me. We both simultaneously exclaimed "It goes!" and continued to explore Peat's Playground, amazed at our find.

Reading through the log books it was noticed that on 21.6.1970 Eldridge and Wolff had investigated the passages as far as chamber four and the following is their account extracted from the log books:

*21/6/70 OFD II Near Moonlight Chamber. Sq. 862E.2/N156.6. New "series" of passages found. (See overleaf - figure 3). The walls of most of the passages are covered with interestingly flattened mud 'flowers'. There are other interesting mud and stal formations. Points marked * are narrow passages which have not yet been properly 'pushed'.*

Gerry Eldridge and Gerry Wolff

Description (see fig. 1 & fig. 2)

Midnight Series to Chamber Four. Access to Northern Lights is either via a tight, unstable boulder choke at the end of the crawl in the Midnight Series (SN 862151665) or via an awkward 10m climb. At the top of the climb, on the left, a narrow rift leads back to the far side of the boulder choke.

3 metres above the boulder choke, a tight tube is descended to a junction where the passage is 5m high. To the right it treads uphill to an impenetrable boulder choke.

Back at the junction, the way on is straight ahead. The walls of the passage are covered in botryoidal moonmilk formations which have a thin layer of brown mud over them. After 15 metres a passage on the right leads to the entrance of Lavender Way, but continuing ahead a small stream is met which soon disappears south into a tight tube with moonmilk deposits. The main passage continues west and ends in a calcite flow with no way on.

Returning to Lavender Way, a slippery 2m climb down a moonmilk bank gives access to a north trending rift passage containing a small stream.

Proceeding along Lavender Way is awkward as it becomes tighter (average width 0.5m - 1m), more sinuous and muddier. Again, botryoidal moonmilk covers the walls and roof and these will be difficult to preserve.

A breakdown of boulders occurs at the end of Lavender Way, and a climb upwards through them leads to a chamber which is at a higher level. Relief is felt on entering a small chamber after the unpleasantness of the "Lav" but this is short lived. Looking back boulders are piled high like sugar cubes above the exit. These are very loose and have been seen to move. Being entombed in the Vault is a daunting prospect.

NORTHERN LIGHTS

Ogof Ffynnon Ddu

BCRA Grade 5

Surveyed by
Jenny Peat
Bob Peat
Ivan Wolton

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N 159

N 158

N 157

N 156

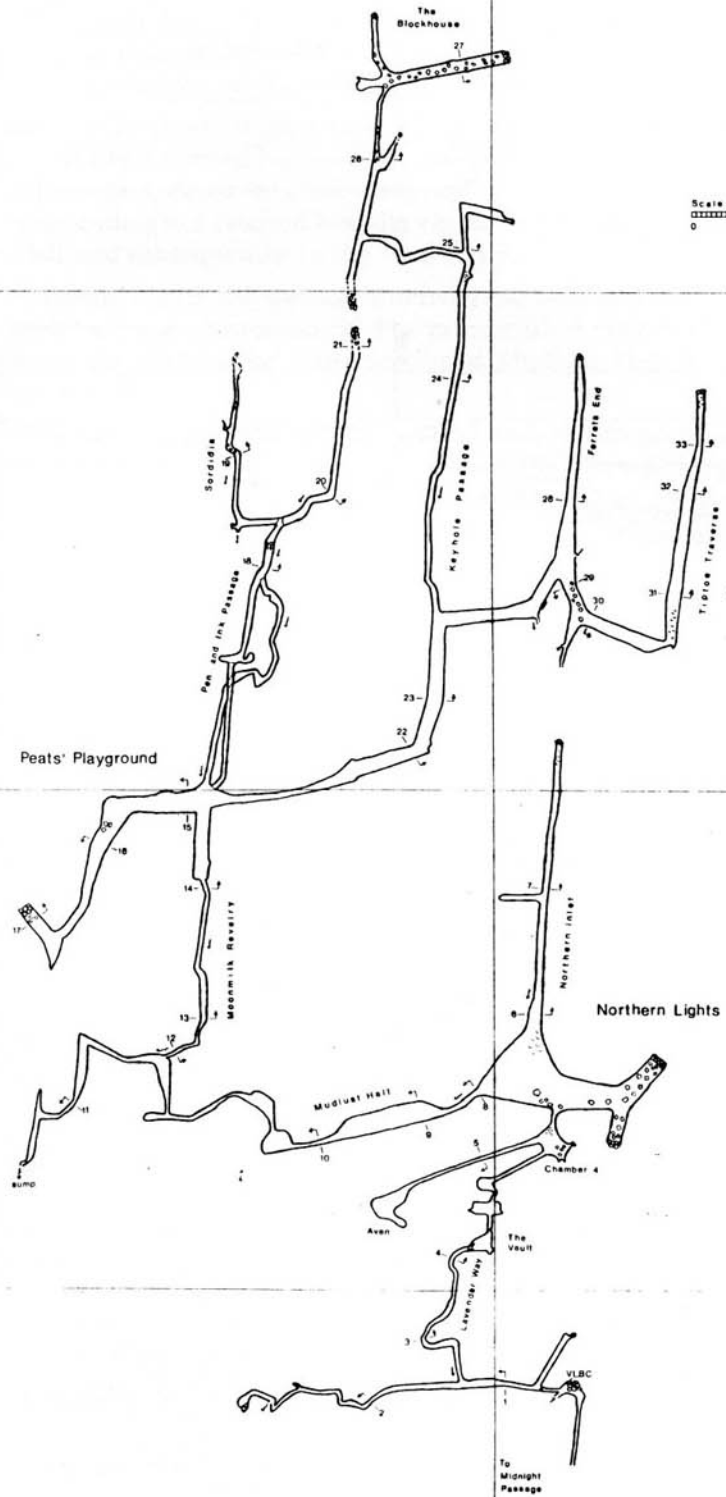
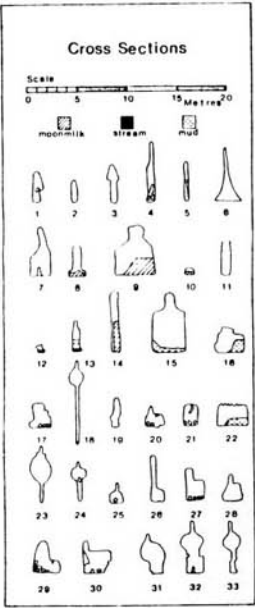


Figure 1

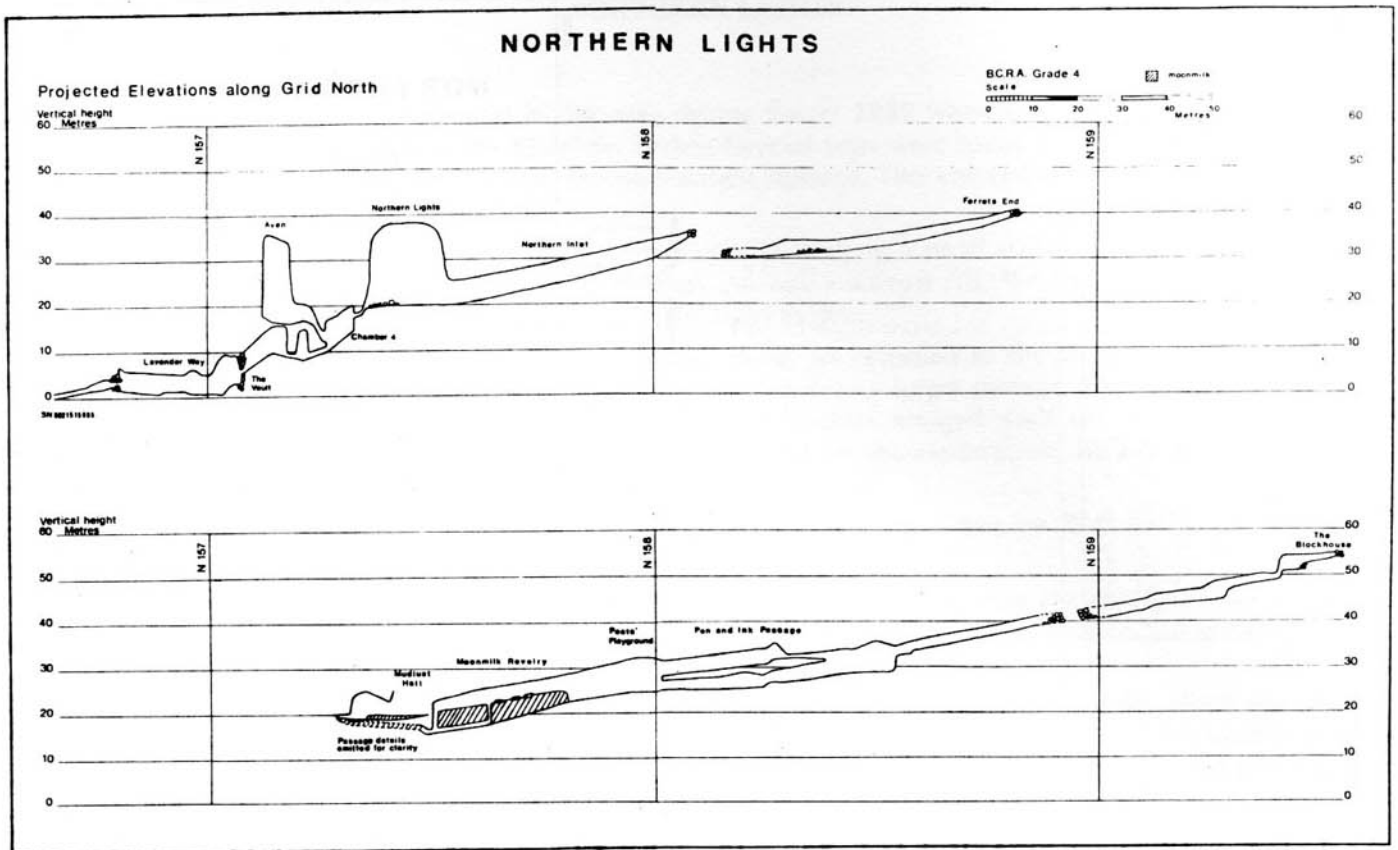


Figure 2

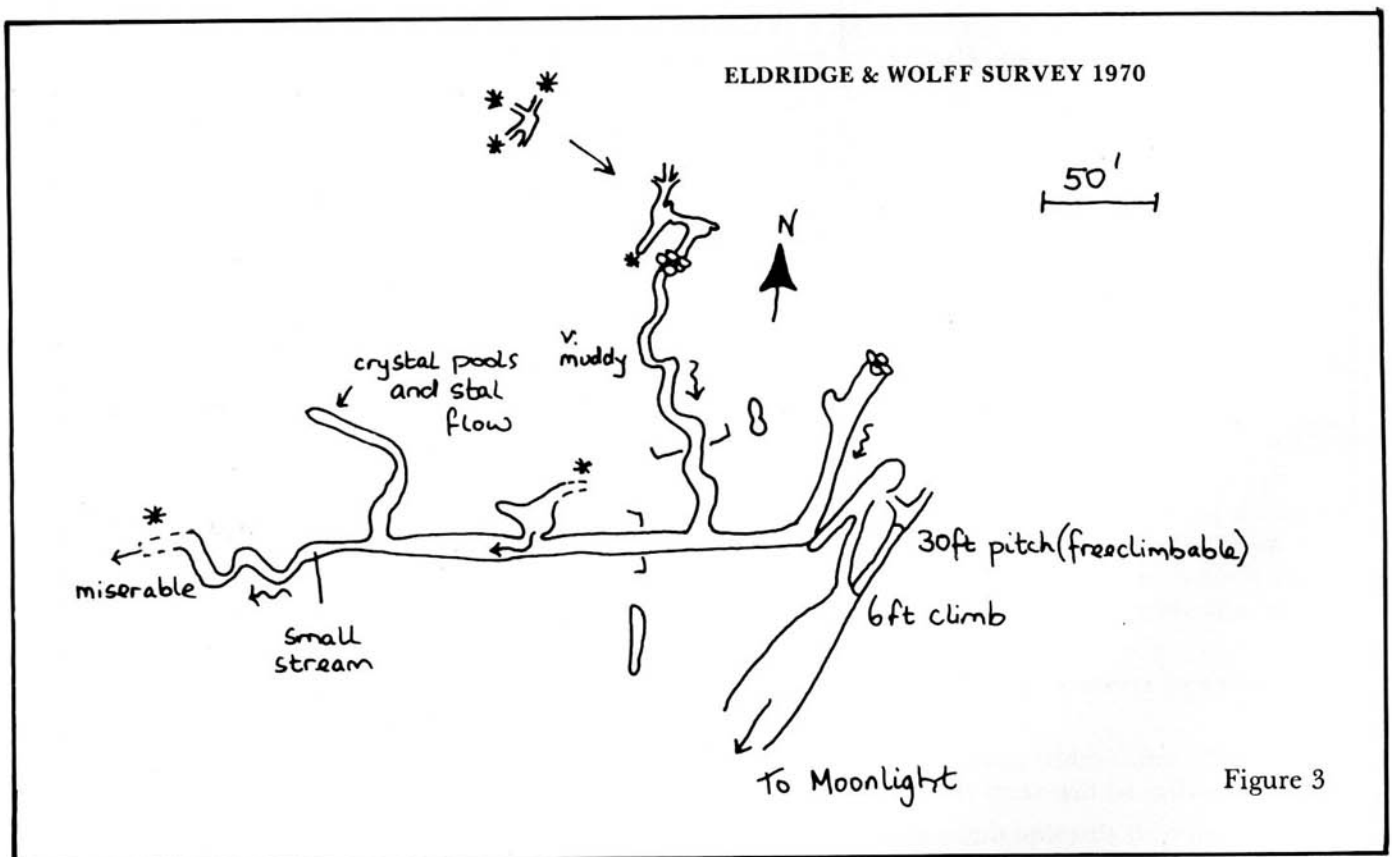


Figure 3

The way on bears left through a small, upward squeeze which soon leads into Chamber 2. This has a few stalagmite bosses and a dry, brown mud floor. Straight ahead, down a hole in the floor, leads into Chamber 3 and by following the obvious way along a stooping height passage the entrance is reached to Chamber 4.

On the left wall of Chamber 4 a very tight rift trends south-west and leads to a chamber containing a 20 metre high aven which is covered in soft, grey calcite.

Northern Lights and Mudlust Hall to the sump. The northern end of Chamber 4 contains a calcite flow over boulders and the entrance to Northern Lights is to the right of this, up a loose 5m climb. Northern Lights is impressive compared to the previous passages. It is 20 - 25 metres high with water dripping from the roof. The route east trends uphill and is terminated by two huge boulder chokes.

Almost opposite the entry to Northern Lights from Chamber 4 is an attractive calcite flow forming a series of stalactites which have all been severed horizontally about 1 metre above the moonmilk infill. One of the tips remains and that has become speared into the moonmilk. On the right of this formation is an inlet which runs north for 60m before ending in a calcited boulder choke. A stream appears halfway along Northern Inlet and flows into Mudlust Hall and subsequently to the final sump.

Continuing west from Northern Lights the passage suddenly narrows and the way on is by following the left hand wall and crawling under a bank of moonmilk. The moonmilk should not be walked over as it easily crumbles. The passage widens as the rectangular cross sectioned Mudlust Hall is entered. Its most notable feature is the vast deposit of moonmilk.

Moonmilk appears to block the western end of Mudlust Hall and, at this point, an example of anastomoses can be seen in the bedding plane roof. The way on is via a rift on the right. This again has much moonmilk infill and at the bottom the streamway has cut a small channel. The true passage size is hard to judge as the route is reduced to crawling through a tunnel of moonmilk. This passage ends in a sump and here the moonmilk deposits are much reduced.

Moonmilk Revelry. 50 metres upstream from the sump an inlet enters from the north through a small tube. A duct containing a right angled bend then widens into a low chamber with a false roof, and by looking up at this point a higher passage can be seen. Care should be exercised on climbing into the higher level as the exit could easily be blocked by damaging the false roof of the chamber.

Moonmilk Revelry is a canyon passage 8 metres high and 1 metre wide. It can be seen to have continued into Northern Lights, but it is now completely filled with moonmilk at the junction. The canyon contains moonmilk 2 - 3 metres thick on which are perched "boulders" of moonmilk. The stream has cut a small channel along the bottom of the passage.

A 3 metre climb down at the end of Moonmilk Revelry leads in Peats' Playground.

Peats' Playground West. The character of the cave passage changes on entering Peats' Playground as red-brown mud now overlies the moonmilk on the floor and the walls are also coated in a thin layer of it. The main route goes east-west at this junction.

Proceeding west is an easy walking passage, which goes downhill and narrows before entering a small chamber. Here a very small inlet passage goes south with moonmilk deposits. This corresponds to a small passage prior to the sump in Northern Lights.

The main route turns north-west up dip for a further 10 metres before ending in a boulder choke. Flies were found on the boulders and a strong, inward draught can be felt.

Peats' Playground to Ferrets End and Tiptoe Traverse. The way east from Peats' Playground is soon reduced to hands and knees crawling over sticky, red mud. On the right hand side of the passage, a tiny skeleton was found. The type and number of long bones suggest the skeleton may be that of a bat, but the lower jaw appears very rodent like with long incisors and a diastema. A deep red calcite floor needs to be crawled past very carefully as it easily collapses under body weight. The passage continues past the devil's dagger, a prominent calcite formation, to a junction. Keyhole passage enters from the left and at this point the main route is a 2.5 m diameter phreatic tube in which boulders line the floor concealing a vadose trench containing a small stream. 20m further on, at the next corner, there are a collection of coloured stalagmites resembling the totem poles found at Big Chamber near the Entrance. Here a small passage, which contains a stream, leads off to the south. Moonmilk lines the bed of the stream and eventually the passage becomes too tight to progress any further and sumps.

Just after the 'totem poles' the main passage splits to give two ways on. To the north is Ferrets End and in the roof some fine phreatic pendants can be seen. It goes up dip for 40 metres, ending in a calcited boulder choke.

To the south, the main route continues passed fallen boulders to an area of dry crystal pools. The passage continues north, up dip, for 50m along Tiptoe Traverse and terminates in a heavily calcited boulder choke.

Pen and Ink Passage. This passage derives its name from a small, fallen stal resembling a quill with an ink pot

on the north east corner of Peats' Playground. There are 2 ways into the Pen and Ink passages. One route is by a 3m climb up a stal wall close to the Pen and Ink formation and gives access to a classical keyhole shaped passage with a narrow 2m deep trench in the floor. This continues due north for 23m before reaching a 3m climb down, on the right of which is a blind pot. A short distance from here, a lower inlet is joined.

The lower inlet may be entered from Peats' Playground by going north along a sinuous stream passage. A tight, slippery rift climb upwards leads to the higher route previously mentioned. To preserve formations the lower route should be taken and the upper route has now been taped across.

Upstream from the convergence of the higher and lower routes is a 3m climb down boulders, just prior to a 'T' junction. On the right and climbing back up to the same level over a small waterfall, the passage continues north and ends in a boulder collapse with a 'wonky' stalactite. There is no worthwhile way on.

To the left, at the 'T' junction, a rift passage continues north into Sordidia. This is a tight, awkward rift with wedged boulders. By climbing up these, a small chamber can be entered. It is possible to squeeze past a stal constriction at roof level and the passage continues for a further 3m before becoming completely blocked with stal flow.

Keyhole Passage. Initially, this passage is keyhole shaped with a 1.5m diameter phreatic tube and a narrow, vadose trench of 1 - 2m deep. The passage continues due north for 65m until a small calcited aven is reached. This has been climbed and there are no ways leading off it. The route turns east-west for a short distance over some crystal pools before entering a north-south passage containing a small stream.

The southern end of this passage has a characteristic flat roof with straws and 'totem pole' formations. This is the continuation of the 'wonky' stal in Pen and Ink passage. As it is impassible, both ends of the passage have been taped off to preserve the formations.

At first it appears as if the northern end of the passage closes down as the water emerges from a boulder choke. The way on, however, is to the left of this passage by delicately climbing through a tight and very shattered region which leads into a fairly large east-west route called the Blockhouse. The western end of the Blockhouse terminates in a stal flow with no exit from the top. At the bottom is a small, muddy passage which goes back under the floor of the Blockhouse and soon becomes blocked with boulders. The eastern and northern limbs both terminate in boulder chokes. The northern limb is possibly not far from the surface as there are flies on some of the boulders.

Moonmilk

One of the most intriguing features of Northern Lights is the vast quantities of moonmilk deposited. In general the moonmilk stretches from northing 157 to 158 and is not found at an altitude of 25m higher than the base of the Skyhook. It is predominantly in Lavender Way, Mudlust Hall, the subsequent westerly passage and Moonmilk Revelry. It appears to stop north of Peats' Playground and is only found in that part of the cave at the most southerly ends of the N.S. trending passages.

The moonmilk is most spectacular in Mudlust Hall, where it can be seen to be layered and forms a 2m high bank. A moonmilk encrustation forms a layer around the perimeter of the hall approximately 2.5m above the floor. This suggests that the passage may have been half filled with stationary or slow moving water. A similar water mark can be followed along Moonmilk Revelry and into Peats' Playground.

The rift leading west from Mudlust Hall appears to be a minor route, but its true size is concealed by moonmilk deposits which completely fill it to the roof. The invading stream has undercut the moonmilk at the bottom of the passage leaving a 1m diameter tube. Towards the sump the passage becomes exposed and can be seen to be up to 3m wide and 6m high.

The entrance to Moonmilk Revelry is through a tube less than 1m high, which is half filled with water, but the actual passage is approximately 7m tall and blocked with moonmilk up to the roof. The invading stream has again cut a channel at the bottom of the rift.

The moonmilk exhibits a variety of mud type formations. The botryoidal formations are found in great profusion and line both the walls and roof of many passages, again suggesting that the passages were most probably once flooded. These formations are very similar to those found in the vandalised passage in the vicinity of Column Hall. At the entrance to Peats' Playground, some of the botryoids cluster to form a small stalactite resembling a bunch of grapes approximately 10 - 15 cm long. Many of the botryoidal formations have a thin layer of dark brown mud covering them.

On the top of the layered moonmilk bank in Mudlust Hall a nest of 'stones' was found. These are solid moonmilk and 10 - 20cm long.

On an even grander scale, in Moonmilk Revelry, moonmilk 'boulders' were found perched on top of the moonmilk infill. These are up to 3m long by 1m wide and 1m deep. Unfortunately the moonmilk is soft and a trench is already being cut into it by passing cavers.

An undisturbed sample of moonmilk was taken from the western end of Mudlust Hall. It was put into a

sealed tube and examined by electron microscopy one week later. The sample was mounted on a steel table and sputtered with gold, 4mm thick, under an argon atmosphere. The resulting photographs can be seen in Plates 1 and 2. The moonmilk consists of needle shaped crystals and thread-like fibres. The needles appear to be rhombohedron in shape and diagonal banding is visible across the surface. They range from 3 um to 10 um in length and 0.3 um to 0.5 um in width. The thread-like fibres were approximately 0.1 um in diameter and varied considerably in length.

Energy dispersive X-ray analysis (EDAX) showed that the sample contained the following elements:

Calcium 90%; Aluminium 5%; Silicon 5%; Magnesium - trace

The EDAX analysis cannot detect elements below sodium in the Periodic table. It is likely that the moonmilk is predominantly calcium carbonate with small quantities of clay.

The moonmilk sample was also treated with acetic acid maintained at pH4. 95% by weight dissolved into solution and the remaining 5% of red clay was filtered off on a 2 um sintered crucible. The residue was then examined under the electron microscope (Plate 3). The clay particles consist of irregular plates, 10 um by 10 - 14 um.

A sample of moonmilk was also collected from the extensions in sand fill deeply cut down and found to be identical to the moonmilk from Mudlust Hall. The moonmilk examined correlates well with samples taken in Salubrious and Aret Chamber (Heathcote, 1977) and also samples from Barenshacht in Berne (Bernasconi, 1975).

As yet no satisfactory answer has been given as to how the moonmilk was formed and what its role was in the development of O.F.D. In this series there is a large and relatively undisturbed source of moonmilk exhibiting various structures. I would hope that someone with a greater knowledge of the subject would be interested in looking at the moonmilk and possibly carrying out further work on it.

Red-Brown Mud Deposits

Peats' Playground and those passages north of it are very different to the moonmilk area of Northern Lights and Mudlust Hall. On the floor red-brown mud is deposited which looked attractive when first found. It seemed to have a thin crystalline crust on top which was cracked like paving slabs. Unfortunately it rapidly degenerates into a glutinous mess when it is walked on. The walls are reddish-brown and fallen boulders litter the route. Much iron staining of calcite occurs and the formations vary in colour from orange to blood red. White sand, such as found in Sandbanks area (OFD2), is absent in the series.

Hydrology

Dye tests were carried out to determine the drainage pattern of the present day streams in Northern Lights and Lavender Way. The results are summarised in figure 4 and table 1. This exercise confirmed the major sources of the three tributaries that contribute to form the Splash Inlet stream in the chamber marked 'aven' on the 1969 main survey. From here, the tributaries converge and flow along Splash Inlet and into the Main Streamway prior to Marble Showers (Jones 1976).

The terminal sump in Northern Lights (A) derives its water from two main flow routes. Water first appears from a loose boulder choke just south of the Blockhouse. It then proceeds south down Pen and Ink passage, emerging via the lower route to flow across Peats' Playground and along the bottom of the rift in Moonmilk Revelry. Here it joins another stream and flows into the Northern Lights sump. The second stream which feeds the sump appears out of boulders at the bottom of a collapsed region half way along Northern Inlet. The stream then flows west through Mudlust Hall, where it has undercut the moonmilk banks, and can be followed on to the sump.

Other tributaries in the area flow in a general south direction. They include a small stream flowing a short way along Sordidia, a stream at the bottom of a vadose trench at the entrance of Keyhole Passage and a small stream entering the southern part of Ferrets End. The latter may possibly be the continuation of water from a boulder choke at Tiptoe Traverse. The water from Ferrets End flows down the passage leading south from the totem poles to a sump, which has been proved to drain into Northern Inlet.

The position of the sump pool in Northern Lights (A) varies considerably depending upon water conditions. During low water conditions a walking size passage can be followed for 10m in a southerly direction. The passage turns west for a few metres and then south again in a flat out crawl ending in a tight sump. It was estimated that the sump passage was extended 15m south from the position shown on the survey. The whole area is dismal, being thickly layered in botryoidal moonmilk covered in dark brown mud. In high water conditions the sump pool backs up easily.

Dye tests were carried out under very low water conditions when surface run off was considerably reduced after a week of continuous frost. 30g of fluorescein was placed in the Northern Lights sump and was seen 1½ hours later at Trevor's Wimp (detector 1). The water was coloured back to the upstream boulder choke where it emerged from a bedding plane. Downstream the fluorescein could be visibly followed as it passed

TABLE 1

Table to show the results of the dye tests used to determine the hydrology of Northern Lights

Position of Detectors	Position of Introducing Dye		
	A Northern Lights sump 30g fluorescein 22.2.85	B Inlet leading south from Lavender Way 30g rhodamine 22.2.85	C Sump pool in Oxbow Extensions 10g fluorescein 24.3.85
1 Trevor' Wimp Lower Oxbow extension	+ve	-ve	-ve
2 Under the rope in in 'aven'. Slash Inlet area	+ve	-ve	-ve
3 Moonmilk Inlet prior to Haydn's dig, Midnight area	-ve	+ve	-ve
4 Moonmilk inlet in extensions of Sandfill deeply cut down	-ve	+ve	-ve
5 Inlet extending west into Sandfill deeply cut down	-ve	-ve	-ve
6 Moonmilk stream in 'aven' Splash Inlet area	-ve	+ve	-ve
7 N.E. inlet in 'aven' Splash Inlet area	-ve	-ve	+ve
8 Sump pool in Oxbow Extensions	-ve	-ve	-
9 Stream entering from an aven at the north- ern limit of Lower Oxbow Extension	-ve	-ve	-ve

under Trevor's Wimp and along the tight connection passage (Worm Way) which emerges under the rope in the Splash Inlet area (detector 2) (McLauchlan, 1984). Interestingly, there is no evidence here of any moonmilk being washed through to the Lower Oxbow Extensions from the Northern Lights sump.

On the same day a second dye test was carried out putting 30g of rhodamine in the southern inlet which gains its water from Lavender Way (B). The source of the water from Lavender Way first appears below the Vault and flows south along the bottom of the rift and then west, where it is joined by an intermittent stream flowing from the east. The rhodamine was not detected until the next day (approx 20 hours later) and was visibly seen to emerge from under boulders in the moonmilk passage east of Haydn's dig (detector 3). The stream then flows into a small tube and along to the extensions at Sandfill deeply cut down (detector 4) (Rogers, 1985). Moonmilk lines the floor of this passage. The stream flows south until the passage becomes impassable after a small pool. In less than 2 hours the dye was seen at the moonmilk tributary in the Splash

Hydrology of Northern Lights

KEY

A,B,C	Position of Introducing dye
1-9	Activated charcoal detectors
↘	Flow of water
↙	Flow of water from sump, Lower Oxbow Extension.
?	Source or destination unknown

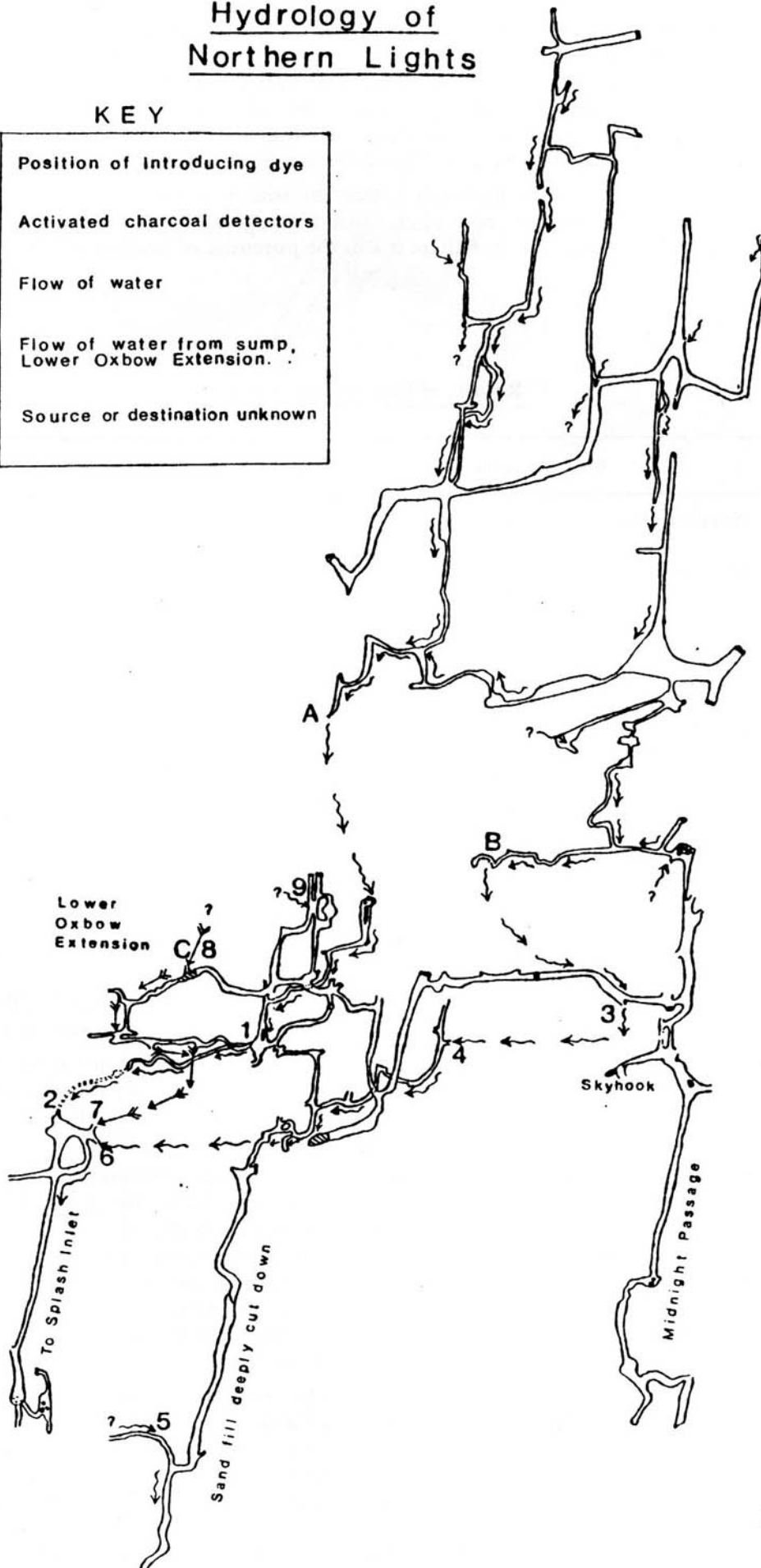


Figure 4

Inlet area (detector 6). At positions B, 3, 4 and 6 the stream passage is remarkably consistent in shape and appearance, comprising of a 0.5m wide tube lined with moonmilk at the bottom in which the water has cut a small trench.

A third dye test was carried out from the sump pool in the Lower Oxbow Extension (C). This water drains off to the south into a slot in the floor. It can be rejoined at a lower level after a short climb. It then flows east for a few metres and is gradually lost under boulders. In flood conditions it proceeds a short distance further and flows into a second southerly passage. The water soon reappears in the lower tributary (detector 7) directly opposite and below the moonmilk tributary in the Splash Inlet area. This passage was pushed a further 200 m until the stream became impassable in a tight rift (Geh, 1985).

The most interesting fact from the dye tests is that the source of the sump pool in the Lower Oxbow Extensions is still unknown. The water here is of an equal, if not greater volume, than the water which drains from Northern Lights, and this suggests that there is still the potential of finding another system north of the Lower Oxbow Extensions.

TABLE 2

Results of Radiolocation Tests

	Position within the cave (figure 5)	Depth below the surface
A	Northern boulder choke in Ferrets End	29 - 32m
B	Western boulder choke in Peats' Playground	23 - 27m
C	Boulder choke eastern end of Northern Lights	37 - 43m
D	Base of skyhook to the Great Oxbow Series	63 - 67m
E	Northern 'aven' under rope in Splash Inlet area	48 - 50m

The sites of the above stations on the surface have initially been marked with 1cm diameter metal tubes which have a plastic head and orange tape tied round the top.

Description of Passages Relative to Surface

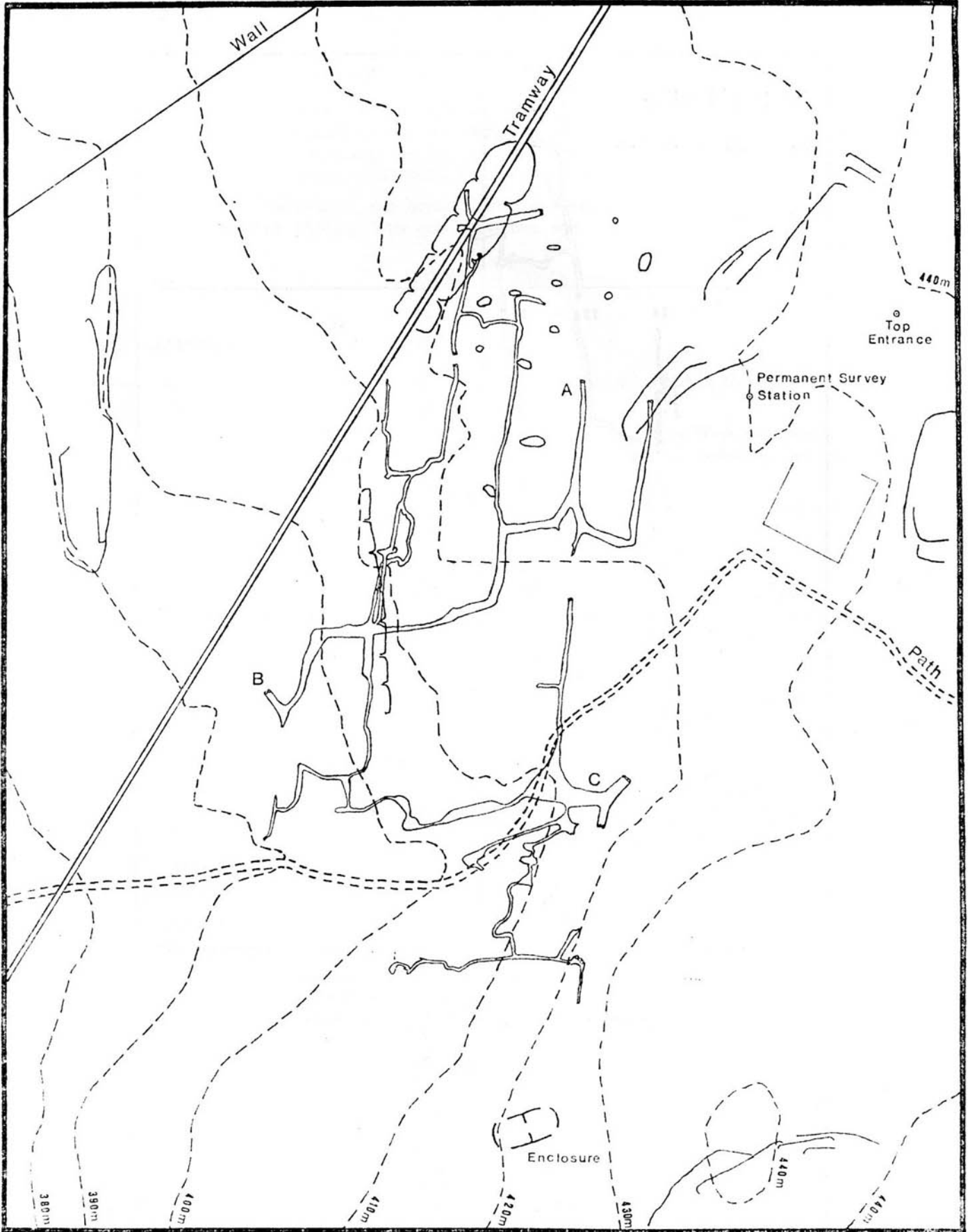
The series is under the block of limestone to the west of Top Entrance (figure 5). The large chamber of Northern Lights passes beneath the gorge-like part of the track which leads to Top Entrance.

The tramway tends to form a natural boundary and the Blockhouse, at the most northerly limit, lies directly under the cutting. The western limb of Peats' Playground is close to a choked depression on the right hand side going up the tramway. This choke is radiolocated as being 23 - 27m below the surface, and within the cave at this point there are flies and a strong draught (table 2).

The development of the passages in Northern Lights follows an east-west, north-south pattern. The major routes trend east-west and are generally phreatic in nature whilst the interconnecting north-south passages show vadose characteristics. The three east-west routes seen in this series are the Blockhouse, Peats' Playground and Northern Lights. The Blockhouse is the smaller of the three and is very shattered. The north-south passages follow a general dip of 12°. The projected elevation for Pen and Ink Passage (figure 2) is typical and Sordidia, Keyhole Passage, Ferrets End and Tiptoe Traverse mirror it exactly. A breakdown occurs along northing 1588 at an altitude of 39m above the entrance reference point (figure 6). Each of the passages end in a calcited boulder choke and it may be that there is another series above which has caused the collapse.

Previous to the discovery of Northern Lights no passages were known in this area except for a few cave remnants close to the tramway track and the 30m long Ogof Ffordd (Jenkins and Williams, 1963). For some reason Northern Lights has become isolated from the main cave, but it does offer scope for further passages to be found in the north. Further west there is the possibility of discovering the continuation of east-west systems. However, to the west of the tramway is a valley filled with glacial drift, which suggests that at this point the passages may have been truncated. Nevertheless, it does seem that a fairly large east-west system did exist to the north of the known cave and there is every possibility that it may have connected with OFD II in the Cwm Dwr/Big Shacks area.

Northern Lights Relative to the Surface Topography



KEY

- Contours
- Rock Outcrop
- A C Radiolocation Sites

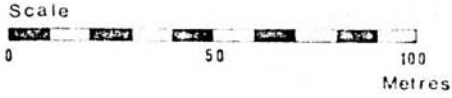
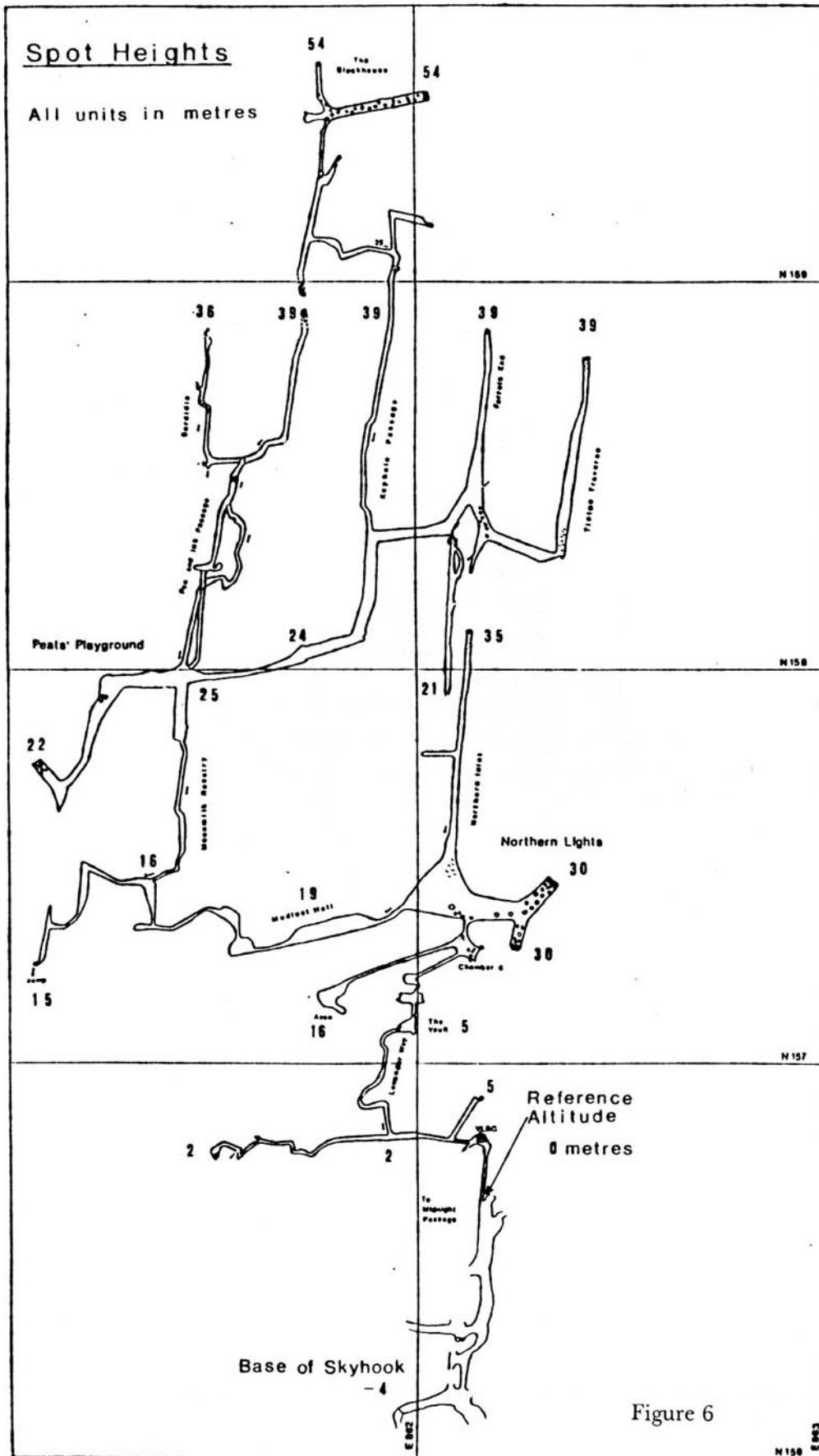


Figure 5



The Survey

The cave survey was carried out using a Sunto handheld compass and clinometer and a Fibron tape. The compass and clinometer were read to the nearest $\frac{1}{2}^{\circ}$ and the tape to the nearest 0.1m. Details were taken at each survey station. The survey was plotted at a scale of 1:500 and then reduced. 231 survey stations were taken covering a horizontal distance of 1396 metres, all of which was previously unsurveyed.

The radiolocation tests correlated well with the survey of Northern Lights, but there is some discrepancy between the position of the Skyhook to the Great Oxbow Series and the Ordinance Survey Grid. Ferrets End (radiolocation site A) was fixed using the permanent survey station on the hillock west of Top Entrance (Mel Davies, 1980) and a grid reference of SN8624 2586 was obtained.

All data, including vertical heights, has been taken with reference to the entrance crawl leading off from the Midnight Series (SN86215 15665). This grid reference was obtained from the OFD survey drawn by P. O'Reilly.

B.C.R.A. Grade 5b

ACKNOWLEDGEMENTS

We would like to give our thanks especially to Ivan Walton who helped in the discovery, surveying and photographing of the passages.

Many thanks also to Anne Bell and Andy Bell for radiolocating, Steve West for radiolocating and surveying, Nick Geh for use of the Lower Oxbow Survey, Annie Peskett for reducing the survey and Mags McLauchlan and Sam Moore for surface work.

We are also grateful to those people who have helped on photographic trips, including Brian Clipstone, Chris Pepper, Tess Lister, Tracy Fenton, Barry, Badman, Mick Day and Annie Peskett.

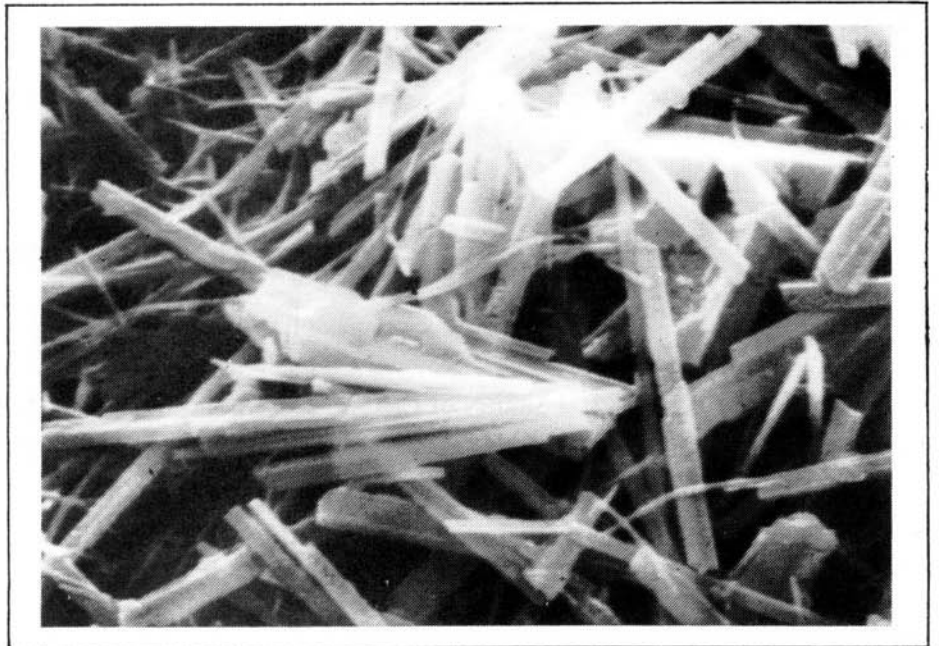
J. K. Peat and R. Peat

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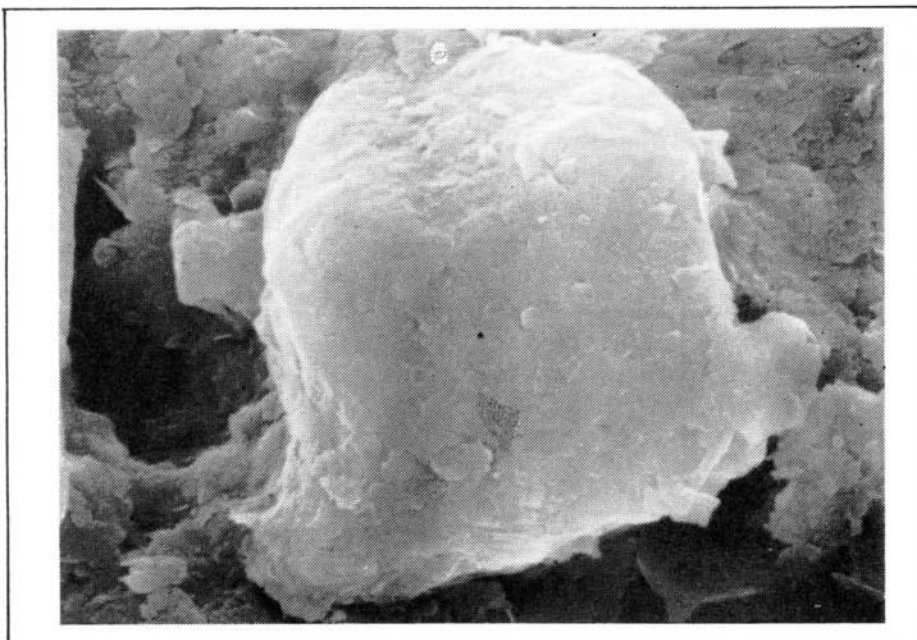


Above : Plate 1



Right : Plate 2

Below : Plate 3



Mike Coburn New Zealand

IT WAS another Friday night on Whiteknuckle Airlines, the little Cessna bumped to a halt on the grass strip and five overloaded cavers staggered gratefully to their '63 Rambler, another South Island caving trip had begun.

Seriously though Folks, this is a tale of skill and daring in the remote and mysterious Marble Mountains to the West of Nelson. Well actually they aren't so remote to those that live there but they are to us of the North, necessitating either a 3 hour Ferry trip or a concentrated 30 minute course in nail-biting in a single engined aircraft to Picton.

Here a group of us keep an old American Wagon for our South Island trips. Another 130 miles of driving followed by a one hour slog up a bush track and we are on Mount Arthur. The party consists of Greg Houston, who discovered this cave and has been the driving force behind its Exploration, Stuart Oehlrich, Dave Chester ex U.L.S.A., Martin Grinsted Ex U.B.S.S., Fred Kahl from Nelson whom we collected en route, and me.

For almost 20 years cavers have been pushing the many shafts on Mount Arthur but as yet none have got through to any significant horizontal passage let alone connected up with the 22 Km of Nettlebed Cave which rises some 680m from the Pearse Resurgence below.

A top entrance would yield a through trip of near 1,000m and be one of the worlds finest trips. Greg has named this cave "WINDRIFT" and this will be my first time down it. To cover up for a dread of vertical caving I have been making excuses, like "Pot Holes aren't REAL Caves" and, "Let me know when you reach some Horizontal Stuff". Well, unfortunately on the last trip they reached the stream at -359m so the time had come to grit my teeth and overhaul my old grey jumars, lured on by Martin with tales of a stream passage just like O.F.D. This, by the way is midwinter at 5000 ft. so we are carrying ice-axes and snow shovels. The entrance is clear on Saturday morning and my last hope of a reprieve vanishes.

The entrance series has nineteen pitches and the largest is "ONLY A FORTY" but I can calculate almost as well as the next guy and I know that means 130 feet in White Man's language, however most of the cave is small, tight and technical and I concentrate on clipping and un-clipping gear, passing Belays, Re-Belays, Deviations and Tails and not looking at the Twinkling lights far below, so that when we reach the stream 2½ hours later I find I've actually been enjoying myself. I'm banking on finding a way through to Nettlebed so I don't have to return up those ropes.

The stream passage sumps of course but the next 10 hours are a delight as we rush around exploring and surveying some of the large phreatic passages around us. Needless to say we don't break through to Nettlebed but, when the survey is drawn one passage appears to have passed the sump and is still going in the right direction, and Windrift is becoming a major cave in its own right.

Now though, its back up those bloody ropes. God how I hate Prussiking up single ropes, it wears great holes in my agnosticism. This time tiredness blunts my fear and by the time we get out the dawn is breaking over Tasman Bay after 20 hours underground. It's time to start thinking about the drive back to the Ferry and work tomorrow. I never knew how good I had it when I lived in Neath.

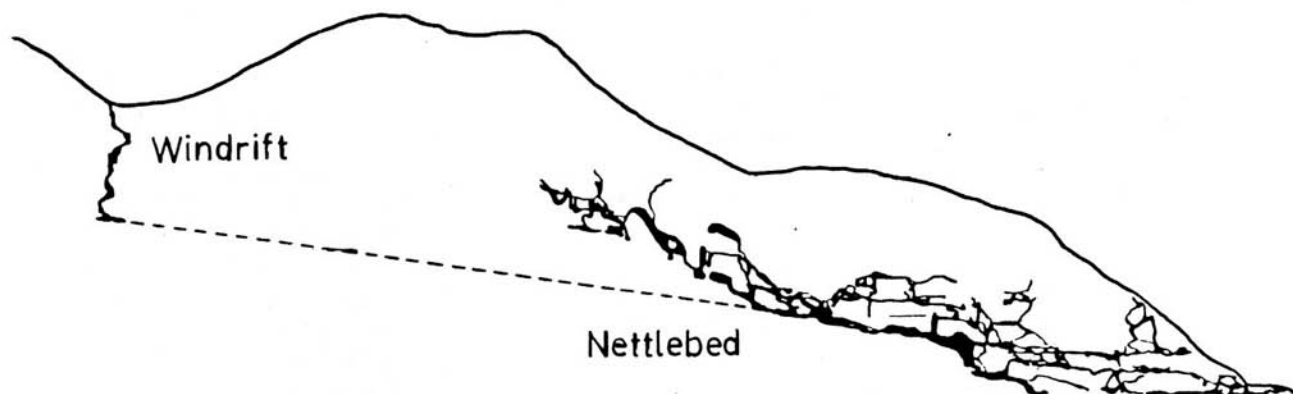
This tale was written some months ago and in the usual way of these things has been overtaken by developments.

The Rambler has been rolled and written off on a skiing trip and planning and fundraising is underway for "WINDRIFT 86". This is to be a six-man expedition spending eleven days underground in early January. Tony Waltham thinks that a Windrift - Nettlebed connection could be a world record for entrance to entrance depth, a fact which we have not overlooked in our search for Sponsorship. Whatever the outcome Windrift '86 should prove interesting.

Mike Coburn



Location map



Cross section of Mt. Arthur

INTRODUCTION

This year marks the 50th anniversary of cave diving in Wookey Hole. Its challenging resurgence sumps have long proved irresistible to explorers, who have pioneered new techniques and equipment in the elusive search for the source of the river Axe. Water sinking at Swildon's Hole and other major caves high on the Mendip hills has proved difficult to follow on its journey through to Wookey. This water reappears in the 25th chamber, 2 km into the hillside. This is at a point beyond 600m of flooded passage at the head of a sump over 60m deep.

To explore this point and discover the next section of cave, the diver would have to overcome many problems. Most of the difficulties are created by the great pressures experienced at depths below 60m, the most significant of these is nitrogen narcosis, encountered when breathing nitrogen gas at high partial pressures. Large quantities of breathing gas are also required to sustain any length of exploration at this sort of depth. Complicated decompression schedules are required to avoid "the bends", compounded by the possibility of surfacing beyond the sump and then returning. Finally, the pressure reduces the insulation provided by compressible neoprene suits, exposing the diver to the cold. In addition to these pressure-related problems, the normal cave diving hazards of bad visibility and small passages when diving alone would still be present.

STRATEGY

Having been involved in the 1982 attempt to find Chamber 26 it was realised that an expedition-style approach was required. In order to avoid excessive accumulation of residual nitrogen in the blood-stream a camp was to be set up in the dry Chamber 24 to allow comfortable delays of over 12 hours between dives. Using this camp as a base, three attempts to pass the terminal sump could be made. In the event of a successful passage of the sump to Chamber 26, lightweight exploration and bivouac equipment (supplied by Lyon Equipment) was on hand. In this fashion, it was hoped that another section of the river Axe could be mapped.

EQUIPMENT, TECHNIQUES AND PEOPLE

Diving Equipment

Due to the problems previously described, standard British cave diving equipment was thought unsuitable. Lightweight composite pressure vessels developed by Acurex Airotherm Ltd. provided the only feasible method of carrying the large quantities of breathing gas. As these cylinders work at a pressure of 333 bar, specially modified Roseidon demand valves supplied by Underwater Instrumentation were used. A flexible high pressure manifold was developed, linking the hip-mounted cylinders to give full access to gas supplies in the event of a single demand valve failure.

To overcome the narcosis effects encountered using compressed air at these depths, a mixture incorporating 36% Helium, 19.5% Oxygen and 44.5% Nitrogen (Trimix) was used instead. However, this introduced additional problems with decompression schedules and heat loss factors. Special decompression schedules were developed in the United States by Dr. John Zumerick to suit the precise gas mixture and predicted dive profiles, whilst extra thermal insulation was provided by a modified Poseidon Unisuit combined with Thinsulate and Damart underwear.

Extensive training with this equipment was undertaken both in the long, deep Florida springs and the cold British sumps of Yorkshire. Great importance was also placed upon a high level of personal physical fitness.

The Team

In order to help Rob Parker accomplish the objectives, a small efficient team was assembled. This comprised of Marco Paganuzzi, Julian Walker and Ian Rolland to help sherpa equipment to camp location. In addition, the latter two acted as support divers during the attempts to pass Sump 26. Dr. Bill Stone was imported from the United States for his knowledge of deep diving techniques and the use of Trimix. Pat Stone, Bill's wife, aided Leo Dickenson in the filming of the project for a television documentary. A total of 6 people were to camp in Chamber 24 for four nights.

Safety Precautions

Due to the serious nature of the dive, a number of safety precautions were also incorporated. After consultation with Dr. Maurice Cross of the Diving Disease Centre at Fort Bovisand, it was decided to surface-feed Oxygen to a full facemask for all decompression at 6m and above. This reduced the chances of both decompression sickness and drowning in the event of convulsions. This equipment, supplied by Underwater Instrumentation, could also be used with relevant schedules and oxygen supplies to recompress a bends victim.

Both Pat Stone and Julian Walker were trained as paramedics and in the event of a serious accident could

control recompression and administer first aid. Ian Rollands was constantly ready to make a fast exit from the cave to alert Drs. Pete Glanville and Maurice Cross through the CRO. Working within limitations imposed by the cave environment these measures reduced the risks involved to an acceptable level.

THE TRIP

Before exploration of the terminal sump could begin, diving, camping and filming equipment had to be stockpiled throughout the cave. Rugged ladders were installed on the most dangerous and awkward climbs to aid the transportation of the heavy, fragile loads into the system. Large watertight containers, weighing 20kg each, were used to protect camping and filming equipment above and below water. More than 50 man loads were eventually required to equip the 5-day camp.

After three weeks of work we were ready to attempt the dive. However, good underwater visibility was essential to aid exploration and, as usual, the British summer did its best to deter us. It was not until Sunday 30th June that the six divers left Chamber 9.

A six-hour trip saw the team at the camp site in Chamber 24. It took a further four hours to establish the camp, but by the end of that day the cavers could relax in the relative comfort of their lightweight Mountain sleeping bags.

During the course of the following day, the line to Chamber 25 was relaid and oxygen decompression equipment carried through. The breathing system for the deep dive was also assembled and checked to ensure correct functioning after its arduous carry into the cave. Meanwhile Leo and Pat filmed as much of the activity as possible.

The first exploration dive took place on Day 3. After an early start, Rob Parker dived through to Chamber 25 with Julian Walker in support. Once in Chamber 25 it took 30 minutes for Rob to make the final adjustments to his equipment. Bill Stone arrived with a cine camera to record the occasion for Leo.

Carrying 315 cu. ft. of Trimix and 40 cu. ft. of oxygen in four separate tanks, the divers descended into the cold water. Visibility was good, in excess of 15m and at a depth of 45m he dumped his first depleted 105 cu. ft. stage cylinder. At -60m he encountered the constriction which marked the limitation of exploration and tied on his line. The gravel floored passage was dipping steeply, forcing the full flow of the river Axe through a gap only 2.5m wide by 0.4m high.

Pushing through this constriction a roomier section of passage was followed ending in a second constriction. Belaying the line to a lead block to secure the return route, the second constriction was attempted. After 4m of hard won progress at a depth of -67m the diver conceded to the cave. Having ploughed a channel into the gravel to reach this point, it was now slumping in behind him and threatening to block his exit route. Three metres beyond the diver, the gravel slope appeared to level off, but the passage to this point was impossibly tight. No further progress could be made via this route.

Returning through the now cloudy water, the first decompression stop was reached at a depth of -18m. The ascent to Chamber 25 took over two hours, this being the penalty to pay for the 25 minute dive to -67m.

The team did not give up the search for Chamber 26. Being in their unique position with plentiful gas supplies and manpower, a thorough search of the sumps upstream of the camp was made in the hope of finding an alternative route. No such route was found.

On Thursday July 4th the team surfaced in Chamber 9 to be welcomed by a champagne reception. News from the camp had been brought out the previous night by Rob Parker after a solo trip to Chamber 24.

CONCLUSIONS

Despite the best possible equipment and techniques and a highly competent team, Chamber 26 had not been found. It is felt that at this time no further progress is possible along the route attempted.

The expedition, however, was successful in other ways:

A new British cave diving depth record was achieved. It is also believed to be the deepest sump explored beyond other sumps in the world. Considering the adverse conditions under which this was accomplished, the achievement is even greater.

The techniques employed in this project have extended the limits to which SCUBA diving has previously been used. This involved the use of open-circuit Trimix and tailor-made compression schedules combined with the unique fibre-glass cylinders and their specially adapted demand valves. Help and advice was gratefully received from both the Diving Disease Centre at Fort Bovisand and the U.S. Navy Experimental Diving Unit.

The expedition achieved a high level of teamwork and co-operation in a harsh and unforgiving environment. It combined the diving expertise of Dr. Bill Stone from the U.S., the experience and talent of Leo Dickenson and the enthusiasm and effort of three British cave divers to execute one of the most ambitious cave diving projects ever.

The expedition was recorded on film for Channel 4 by Leo Dickenson and HTV. This is the first time

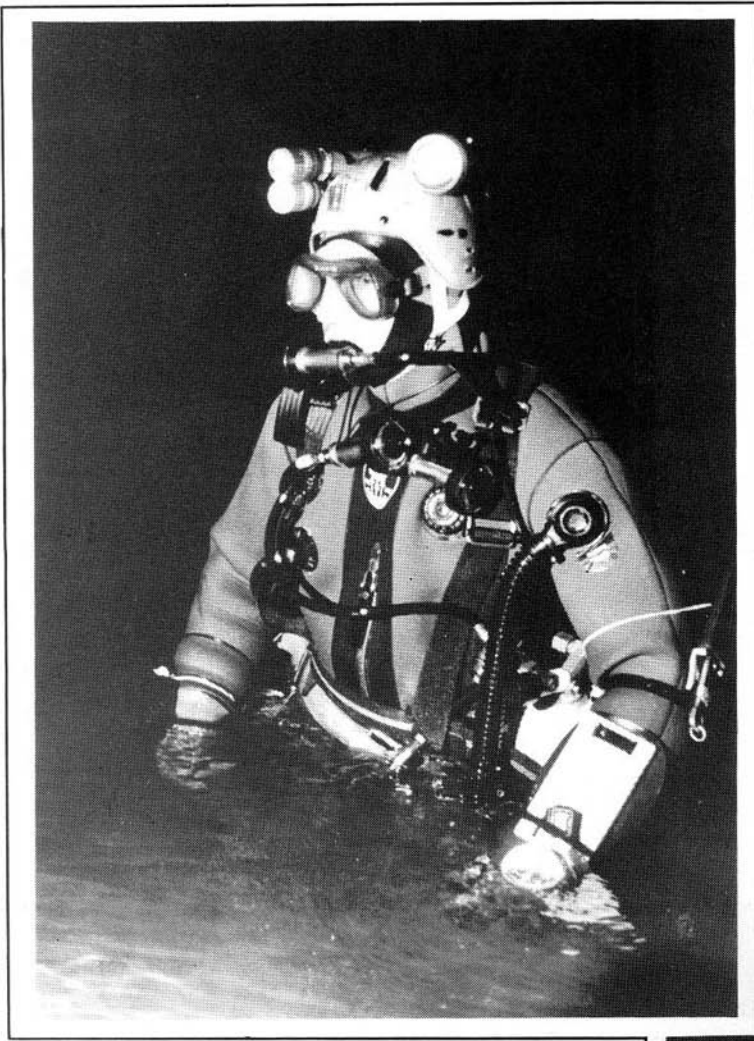
that a professional cameraman has recorded such activities and is a tribute to the dedication of Leo. The film will be shown on Channel 4 in 1986.

The members of the expedition would like to thank all their sponsors, without whom none of this would have been possible.



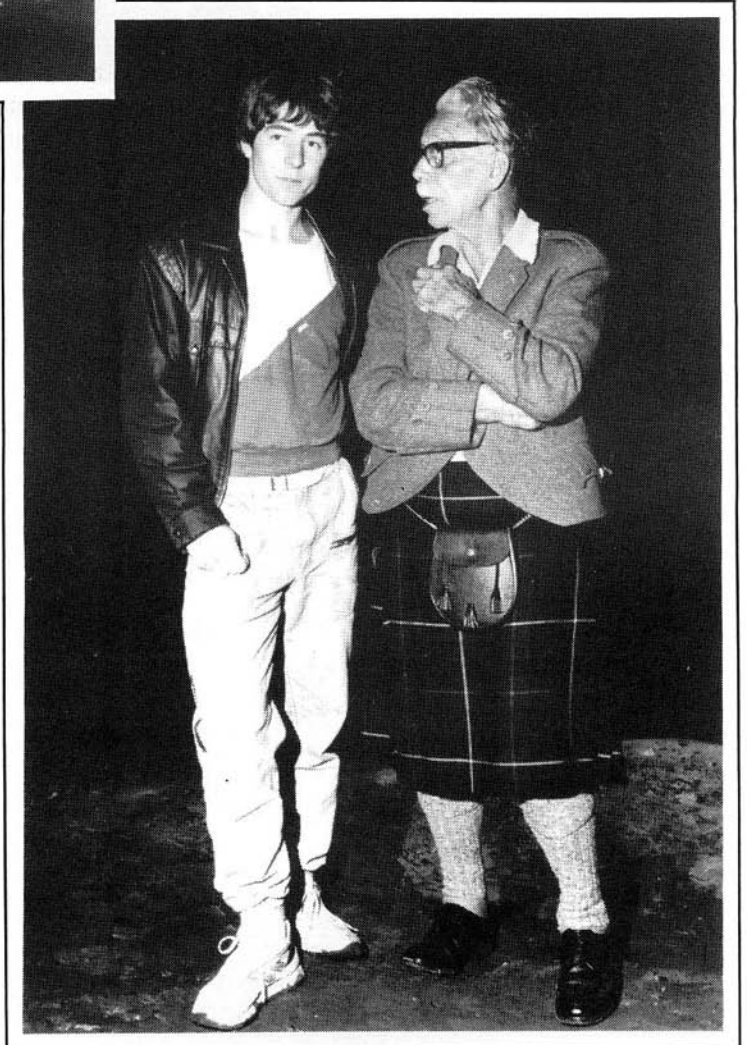
Above : Rob Parker checking gear, Wookey

Left : Rob Parker, Wookey



Above : Rob Parker, Wookey

Right : Rob Parker & Graham Balcombe
Wookey : 50th anniversary of cave diving.



A visit to Admirals Cave, Bermuda

During a recent visit to Bermuda I had the privilege of visiting the cave where it could be argued scientific caving began. I was doubly lucky in that my guide was Dr. Tom Illiffe a scientist who has put spaelozoobiology on the map and has published scientific papers in such highly regarded and prestigious journals as Nature and science about the animals which occur in caves.

Admirals cave itself is a large highly decorated chamber that slopes at about 20-35° to meet the seawater table at about 75 ft below the entrance. Tom is a cave diver in the Martin Farr class and the purpose of our visit was to examine some baited underwater traps to see if he had managed to catch any of the rare crayfish that inhabit some of Bermuda's hundred and fifty or so caves. These members of the rich and diverse invertebrate fauna that are found in Bermuda's caves are especially interesting because their nearest relatives are known only from such now far away places as Ascension Island in the South Central Atlantic, or the Eastern Atlantic and occasionally from the somewhat closer but still remote islands of the Carribean. The hypothesis that the organisms of the Bermuda caves have survived in these isolated refuges over geologically long periods of time while the land has drifted apart because of the moderate and stable temperature conditions in caves is both fascinating and persuasive.

The main hazard of visiting the cave exists before you even get to the entrance. The walk from the hotel car park to the cave degenerates into a push through quite dense undergrowth. Amongst the plants in the thicket there is an innocent looking plant with sparse leaves looking somewhat like a lilac. Its called poison ivy; by reputation and the amount of respect the locals pay to it, it is a sort of mega stinging nettle in the multiple bee sting class. Needless to say I had no desire to investigate the veracity of this claim.

The entrance was spacious enough to stand up inside and there was room to change into Bermuda-style caving gear of track shoes, shorts and T-shirts. The air temperature inside is around 70°F. The entrance is shaded by a jungle of tropical plants. Carbide lamps were the order of the day and that welcome thump of the gas igniting brought back happy memories of caving in South Wales and prompted me to write this article.

The cave it self is really nothing more than a large sloping chamber 180ft long, 40 to 60ft wide up to 30 ft high that extends downwards at 30° or so to a tidal sea water pool. The cave is beautifully and richly decorated as are all the Bermuda caves. Halfway down the main hall there are two vast stal columns, close by them is the cut off base of a large stalagmite some 2ft in diameter. There are what looked like small short shot holes drilled into the edge. These holes are split so that they are now half cylinders about 3½ inches long and half inch in diameter. There were five small domes of new stal on the cut surface where the

stalagmite was reforming from the activity of drips from the roof. My comment on vandalism was greeted by a fascinating story. The original stal was 11ft high and weighed 3½ tons. In 1819 Admiral Sir David Milne who was at the time C in C North America and West Indies had it cut down for a trophy and shipped back to the Museum of Edinburgh University. In 1863 his son Sir Alexander Milne who was at that time C in C of the same station (nepotism?) examined the stump. He noted the five small blebs and noticed that on two of them the drops were at the rate of 3 or 4 per minute, whereas the drips onto the other three were much slower. He calculated that about 5cu inches of stal had accumulated in 44 years. He wrote to his brother Sir David Milne-Holme who using these figures calculated the stal to have a volume of 76,000 cubic inches and an age therefore of about 600,000 years. Milne-Holme had enough sense to write in his discussion that he was assuming a constant rate of deposition.

Ten years later in 1873, Wyville Thomson who knew the story came along and took drillings from the base (the short holes that I saw) but much more historically exciting, he tried to take the first underground cave photograph in Bermuda using magnesium powder. Like many people since then, he failed in a cloud of white smoke.

It took quite a bit of research to find out why the drill holes were cut in half. It turned out that Captain Wyville Thomson ordered his Captain Alpin to cut a slice of the stal, and Captain Alpin took advantage of the drill holes to cut between them and to ease his task of cutting through the whole stal.

Well what of the stal today? For a long time it was on display outside the mathematics classroom in Edinburgh University. About ten to fifteen years ago during rebuilding of the classroom it was deliberately smashed up with sledge hammers. The final act of vandalism.

DYE TESTING ON PANT MAWR

In December 1984 a dye and spore testing exercise was carried out in the Blaen Nedd - Pant Mawr area of Powys. The object of the exercise was to ascertain whether the known resurgence of the Pant Mawr Pothole water called R1 is the resurgence for all the sinks on the Pant Mawr hillside, or whether other resurgences help to drain that upland also.

I was asked to do the tests by members of Croydon Caving Club who are currently researching the area; they assisted in the task and indeed did most of the net sampling for me, my thanks especially to Jon Young who co-ordinated the whole exercise.

December 15th

On a drizzling morning, with scattered snow on high ground and medium-high water conditions, lycodium spores dyed various colours were poured into sinks on the western side of the Afon Nedd Fechan; the sinks treated were as follows:

OGOF CUL at SN9017.1510, altitude 400m., a shallow depression in a dry valley north of the Pant Mawr ruin, which had been dug to a depth of around 3m to intercept a small stream, a Croydon C.C. dig - treated with 400g of Safranine Orange spores.

PANT MAWR SINK at SN8909.1622, altitude 436m., the main sink for the water entering Pant Mawr Pothole, high on the flanks of Fan Gihirych - treated with 400g of Methylene Blue spores.

EIGHTEENTH HOLE at SN8991.1383, altitude 400m., a stream sink just inside the forestry boundary about 1km due west of Pwll y Rhyd, again an old Croydon C.C. dig - treated with 400g of Magenta spores.

SARN HELEN SINK at SN9076.1395, altitude 327m., a stream sinking in a grassy doline near the gate at the northern edge of the forestry on the Roman Road, Sarn Helen - treated with 400g of Malachite Green spores.

PWLL or OGOF DERWEN at SN9087.1294, altitude 331m., a stream sink in a rocky depression below a gritstone cliff 0.5km northwest of Dyffryn Nedd Farm - treated with 400g of Fluorescent spores.

After the spores had been deposited, the afternoon was taken up putting out Plankton nets in likely resurgences:

R2. one of the resurgences for Ogof Afon Nedd Fechan (Little Neath River Cave) at SN9119.1207, altitude 215m., a resurgence from a mossy boulder pile on the west bank of the Nedd Fechan opposite Pwll Du, the other resurgence for LNRC. R1. a resurgence from a narrow rift in the bed of the river upstream of R2, beyond the sharp bends in the river and towards the west bank; at SN9120.1226 altitude 227m. the resurgence for Pant Mawr Pothole water.

WHITE LADY CAVE at SN9111.1368, altitude 288m, the water flowing from the cave is captured upstream at Pwll y Rhyd and is maybe fed by other inflows inside the system.

BLAEN NEDD ISAF SPRING at SN9110.1433, altitude 320m., a spring at the north end of a field opposite Blaen Nedd Isaf farm, some 5m. from the west bank of the river.

The nets being so placed, the rest of the afternoon and early evening were spent inspecting the area to the north and west of Blaen Nedd Isaf where several small sinks, one newly discovered resurgence and a fine example of a Vaclusian Spring were noted and recorded. The evening also saw several of us digging in a draughting collapse near the farm where we found (by digging) and lost (by roof falls) several metres of cave.

The following days were spent sampling the plankton nets in the various resurgences and, in later days, after a flood pulse had traversed the Nedd Fechan, trying to repair the damaged nets.

The Results

December 16th, evening; Magenta and Fluorescent spores were detected in the R1 net; no other net yielded any spores.

December 17th, evening; Magenta, Fluorescent and Malachite Green spores were detected in the R1 net in some quantity. Safranine Orange spores were detected in the R2 net - a very unexpected result.

December 18th. A flood pulse traversed the valley and some nets were damaged, especially the White Lady Cave net which tore down its whole length and the R1 net which was totally destroyed, it being in the main flow of the river.

December 19th. The nets were removed from all the resurgences and analysed later by me at the College in Ebbw Vale. Safranine Orange spores were again found in the R2 net, confirming the previous result.

The Blaen Nedd Isaf Spring net and the White Lady Cave net showed no presence of spores at all during the test.

Conclusions

The spores travelling from Eighteenth Hole, Pwll Derwen and Sarn Helen Sink to R1 was to be expected as Pant Mawr Sink had already been traced to R1 by SWCC members in the early 1970's. The lack of Methylene Blue spores from the Pant Mawr Sink can be attributed to the net being destroyed by the flood before these spores had arrived from the most distant sink.

The presence of spores from Ogof Cul in the R2 net is much more significant as it suggests one of two so far unexpected routes for underground water in the area: either the water from Ogof Cul passes under the Nedd Fechan river and, travelling via LNRC and/or Bridge Cave, resurges at Pwll Du and R2; or the water from Ogof Cul passes under or over the Pant Mawr - R1 water course within the limestone strata to resurge directly at R2. The lack of Safranin Orange spores in the White Lady Cave net precludes any flow down the surface river by water from Ogof Cul.

A further set of tests was obviously needed to confirm these conclusions, so, on December 28th, a fine dry day with medium water conditions, Jon Young and two intrepid cavers from Croydon C.C. and myself set out to repeat the Ogof Cul test.

The intrepid two entered Little Neath River Cave to put charcoal detector bags in the Northeast Inlet (near Canal Bypass) and in the Canal Bypass Inlet. The water was rather high and very, very cold, so volunteers were difficult to find. My thanks to them.

Jon and I entered Bridge Cave to put charcoal detector bags in the main inlet and in Tributary Passage; we then walked up to Ogof Cul to deposit 400g of Bismark Brown spores (a colour not previously used) and 200g of Fluorescein dye into the stream at the bottom of the dig.

Plankton nets were put into R2 (as before), White Lady Cave (as before) and into PWLL DU at SN9121. 1206, altitude 215m, a large rising on the east bank of the Nedd Fechan opposite R2, the main resurgence for LNRC and Bridge Cave water.

December 30th

The charcoal detector bags were removed from LNRC and Bridge Cave and analysed for the presence of absorbed fluorescein dye. All were negative, but peat residues were found in the Bridge Cave inlet bag and in the Canal Bypass Inlet bag - indicating that water flowing in these passages has not been underground for any great distance. The other bags yielded very little peat indicating a much longer distance underground between bag and sink; the Northeast Inlet bag in LNRC was especially clean.

No dye must indicate therefore that the Ogof Cul water does not enter LNRC or Bridge Cave at least in the upstream areas of these systems.

December 31st

The plankton nets in R2 and Pwll Du were sampled and removed.

January 1st

The White Lady Cave net was sampled and removed.

The results of microscopic inspection of the sediments in the nets confirmed that R2 was indeed the resurgence for Ogof Cul. The R2 net contained many Bismark Brown spores, whereas the other two nets were both free of spores.

Final Conclusions.

Ogof Cul would seem to be part of an active cave system which is independent of the main drainage of Pant Mawr and which feeds the resurgence R2, one of the resurgences of the Little Neath River Cave system, but on the other side of the valley. The presence of a fault running from the area of Ogof Cul southwards to the area of R1, R2 and Pwll Du may be relevant.

How valuable this information is has not yet been assessed, but it adds to the general understanding of the hydrology of the area, and, once again, shows it to be more complicated than was originally thought - in line with other areas of the Northern Outcrop.

W. Gascoine, February 1985

My thanks to the Welsh Water Authority who provided the funds for me to purchase spores and plankton netting.

Note : Observations about Ogof Cul. NGR SN 9019.1489

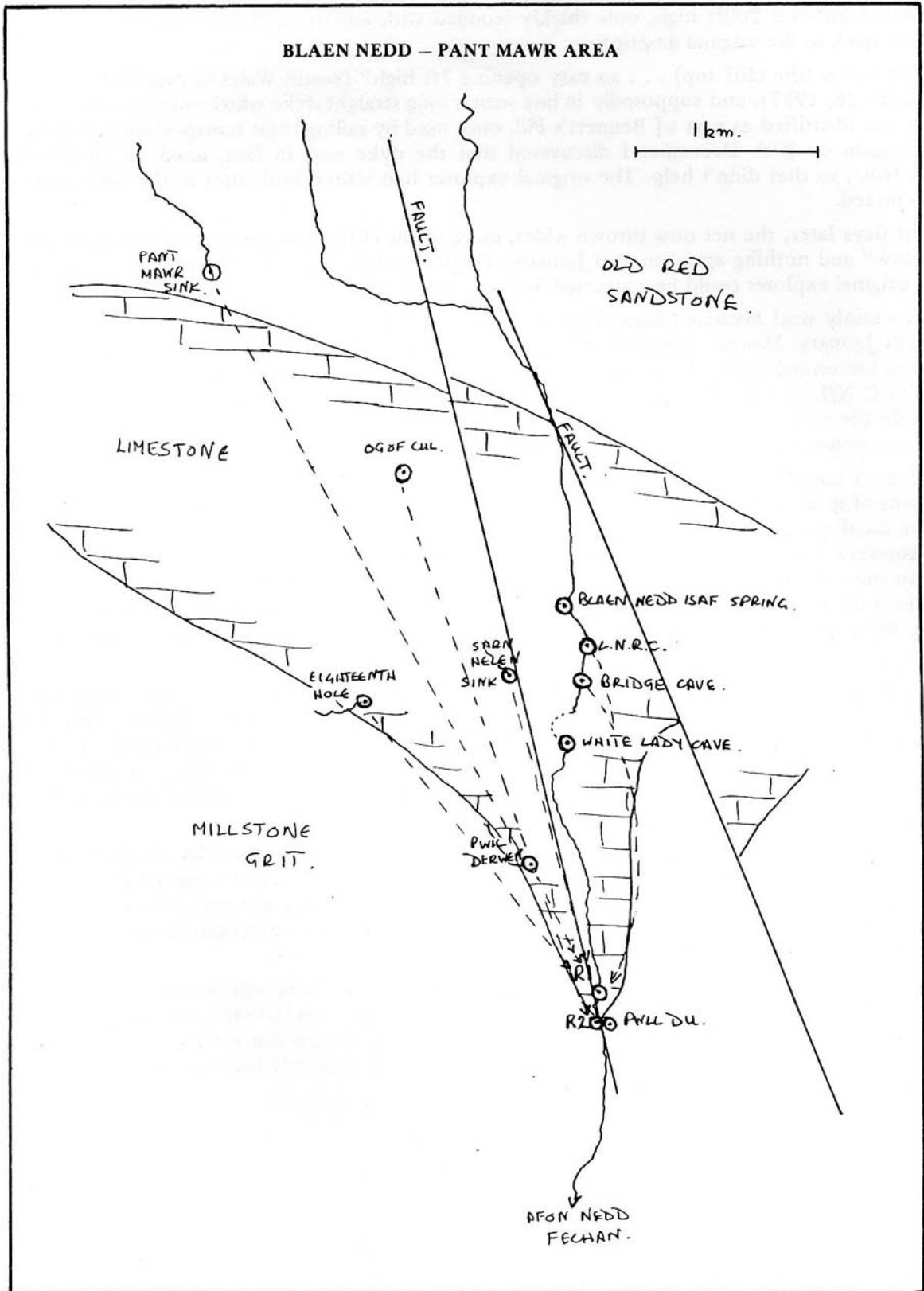
Ogof Cul is a short ($\approx 270'$) cave containing a stream which flows throughout the year.

The wet weather volume of the stream is comparable to that which flows in the lower Cwm Dwr stream-way in similar conditions.

The cave exhibits a strong draught on occasions.

The dry valley in which the cave is situated appears to be developed along a major North-South joint.

The cave becomes progressively larger in cross section as it is joined by several inlets. The cave ends under a surface shakehole, in a boulder choke.



WOOLEY'S HOLE REDISCOVERED

Melvyn Davies

As part of the programme to identify Gower caves containing bats, Wooley's Hole was marked down for attention in November - but where actually was it? 'Caves in Wales and the Marches' said it was in Cheriton, which at least is the right parish on North Gower Coast. Stratford's 'Caves of South Wales' omits it completely. The Cambrian Cave Registry has on its cave list only a grid reference to the nearest kilometre square, and Oldham's 'Caves of Gower' gives a grid reference which was east and south of Bovehill Pot where it clearly could not be.

Two afternoons were spent clambering up and down the north-facing slopes and crags of Tor Grove, a once-quarried outcrop 200ft high, now thickly wooded with ash trees, blackthorn, hazel and brambles, but to no avail. Back to the original description:

"40ft below (the cliff top) . . . an easy opening 7ft high" (South Wales Caving Club N/L 15, 1956, and British Caver 28, 1957), and supposedly in line with a long straight dyke which runs seawards. With a 6" map the dyke was identified as part of Bennett's Pill, once used by sailing ships transporting limestone. Traversing the cliffs again on 27th December I discovered that the dyke was, in fact, lined up on Bovehill Pot **not** Wooley's Hole, so that didn't help. The original explorer had visited both sites at the same time and got the locations mixed.

Four days later, the net now thrown wider, more of the cliff top was traversed but nothing was detected "40ft below" and nothing again on 2nd January. Desperate now after five visits with no luck, I thought perhaps the original explorer could be contacted, but was he still alive?

He certainly was! Maurice Clague Taylor was tracked down to a house in Gowerton and I called to see him on 4th January. Maurice joined the South Wales Caving Club in 1950 and explored caves within 30 miles of Swansea for several years. All publications relating to Wooley's Hole were based on one published article in the SWCC N/L and in the British Caver of 1957. Maurice showed me his photo album containing four views inside the cave, and one view of the entrance looking outwards, all taken in 1955 and 1956. However, he could not remember exactly where the entrance lay - east or west of Bovehill Pot.

At least I knew now that the entrance I was looking for was 6ft high and almost 2ft wide, with an elder tree in front of it, so on 7th January, armed with binoculars, I trudged over Landimore saltmarsh, frozen quite solid after six days of hard frost. Focussing at regular intervals on the cliffs towering above I was thrilled to spot an entrance which fitted the photograph, but there was no elder tree. Not having any ladder I tried climbing up to the cave from the top of the scree 40ft below, but the rock was too smooth and steep, however I climbed to a miniscule ledge east of it and managed to traverse across. The elder tree had been reduced to a stump by the passage of 29 years since Maurice's day, and the front ledge was now occupied by several hazel shrubs.

I returned with a light next day and explored to the lip of a tight pothole some 60ft inside, carefully avoiding five Lesser Horseshoe bats on the way. A sixth hung in the pot so I could not proceed further without causing disturbance. Maurice's enamel digging bucket was tucked behind a boulder nearby, and to all appearances no one had been into the cave for 29 years. It was an eerie feeling. Spring is now eagerly awaited, and when the bats have departed I will return with assistance to explore the rest of the cave, after all what is four months after a lapse of nearly three decades?

The story does not quite end there, for three yards east of the entrance lay another, an arch filled to within 4" of the ceiling with brown earth. Carefully sifting the surface layer I proved it to be non-archaeological (a necessary precaution in Gower caves), and then screwing together my collapsible shovel, I dug for an hour and got into a passage with immediate standing room. Another Lesser Horseshoe bat stood guard 30ft in so I did not push it, especially as nobody knew exactly where I was.

The grid references of these caves and directions for reaching them will be published in the next issue, after I have had an opportunity to complete explorations when the bats have left. My draught test in Wooley's Hole with a strategically placed candle suggests a system closed at the bottom end, but of considerable volume, rather similar in structure to Bovehill Pot. Wooley's East Hole is evidently much smaller, and I venture to predict that it will be blocked just round the corner.

Reynoldston
Gower

