

# MULU CAVES 2017.2

An Anglo-Malaysian Expedition to the  
Gunung Mulu National Park, Sarawak





**REPORT**  
**on the findings of**  
**THE MULU CAVES 2017**  
**EXPEDITION**  
**to the**  
**GUNUNG MULU**  
**NATIONAL PARK**  
**SARAWAK**

**During October 2017**

**Expedition Leaders: Mark Brown & Dave Nixon**

*Compiled and edited by Matt Kirby*

*Maps & Diagrams by all team members & Hugh St.Lawrence*



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*Helen Fairclough amongst stal at the start of Phreas a Bird*

*Tom Smith*



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*Cover design by Hugh St.Lawrence from photos by Pete Hall (front) and Tom Smith (rear)*



# **ABSTRACT**

*Between 12<sup>th</sup> and 31<sup>st</sup> October 2017 a team of eight cavers, with the close support of National Park staff and the Sarawak Forestry Corporation, set up a base camp at Camp 5 in the Melinau Gorge. The expedition had two major objectives:*

## ***Exploration in Whiterock Cave***

*Since its discovery in 2003 Whiterock Cave has become, not only, the longest cave in the Park, at just over 100km, but also the largest component of the Clearwater System. Any expedition based at Camp 5 can be guaranteed to find something within its labyrinthine structure. This expedition was to be no exception and the relatively small team made significant discoveries at both base level and also in the highest parts of the cave where ramps were scaled in an attempt to gain access to the elusive 'fourth horizon'; the equivalent level to the Creedence Series in Clearwater which had proven to be so extensive. Approximately 1.7km were explored and surveyed just off the Whiterock River and other higher level discoveries added another 2.4km.*

## ***The Search for Wonder Cave***

*A team of three explorers joined the expedition with the specific task of climbing the cliffs above White Rift Cave in the Melinau Gorge. Footage from a previous helicopter fly-past had revealed an obvious entrance feature approximately 230m above ground level. This feature was in direct line with the Wonder Cave with potential for access from the north into the unexplored ground in between. This project, which entailed considerable climbing and bolting skills, gained access to the feature and although it was found to be completely blocked with stal it did confirm that cave development existed at this horizon and on this line.*



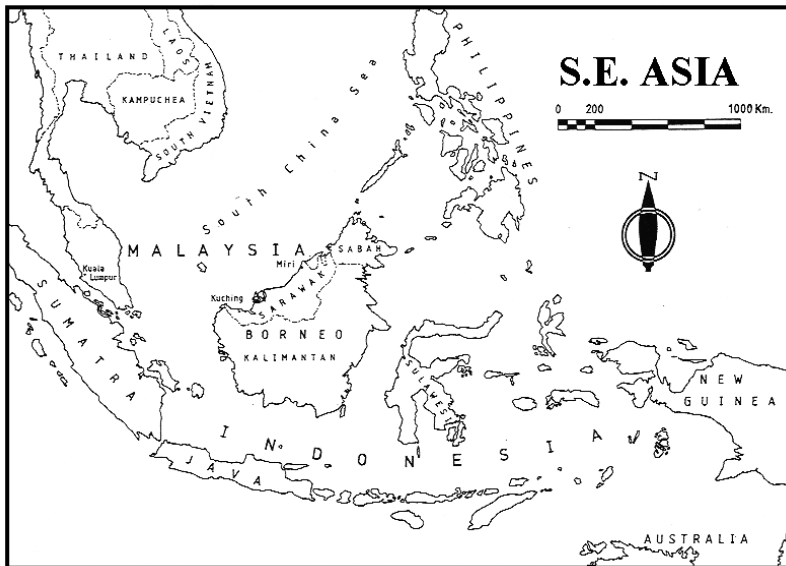
***Strong Hint of Bigness***

***Helen Fairclough***

# **INTRODUCTION**

## **LOCATION**

The Gunung Mulu National Park is situated in north-eastern Sarawak, with its northern boundary forming part of the border with Brunei, (Figs. 1 & 2). It was officially constituted in 1974 and opened to visitors in 1985. Lying 4° N. of the equator it covers an area of 528sq km.



The Park is dominated by the sandstone mass of Gunung Mulu, which rises to 2376m. To the west of Mulu, and on its flank, lies a band of ‘Melinau’ limestone, which forms the lesser peaks of Gunung Api and Gunung Benarat. The lower slopes are covered in dense tropical rainforest, which rises to meet the montane forest of Mulu’s upper slopes.

**Figure 1: SE Asia**

Mulu is a rich mixture of plant and wildlife and in the limestones, beneath the forest canopy, lie some of the world's most impressive caves.

## **HISTORY of EXPLORATION in MULU**

The existence of large caves in the Gunung Mulu area of Northern Sarawak has been documented for over 150 years. In 1858 reference was made to “Detached masses of limestone, much water-worn, with caverns and natural tunnels” around the base of Mulu by Spenser St. John in his book *‘Life in the Forests of the Far East’*, (St. John, 1862).

St. John was ‘Consul General in the Great Island of Borneo’ and made some of the earliest exploratory journeys of any European into the interior of Sarawak. His attempts to reach the summit of Mulu were thwarted by limestone cliffs, dense forest and sharp pinnacles of rock and he says, “It is almost impossible to conceive the difficulty of ascending this mountain”. Mulu was to keep the secrets of its summit for a further 74 years until Edward Shackleton successfully climbed the mountain during the Oxford University Expedition of 1932, (Harrison, 1938).

In 1961 G.E. Wilford, of the Malaysian Geological Survey, visited the area to explore its caves. His work included the surveying of Deer Cave and parts of Cave of the Winds. He predicted that Mulu would yield many more caves in the future, (Wilford, 1964).

During 1977-8 the ***‘Royal Geographical Society Mulu Expedition’*** spent 15 months in the area studying many aspects of the rainforest. This was the largest scientific expedition ever to leave the



UK. Included in the team were six speleologists who, in three months, explored and surveyed 50kms. of cave passages including parts of Clearwater Cave, Green Cave and others, (Brook & Waltham, 1978).

During the expedition a forest camp was established in Hidden Valley from where two major caves were explored. 'Wonder Cave' on the north side of the valley was found to have some of the largest passages in Mulu. 'Prediction Cave' on the south side also contained enormous passages which were almost filled with river sediments, (Meredith, Wooldridge & Lyon, 1992, p.10).

It was obvious from these findings that Mulu ranked as one of the world's foremost caving regions.

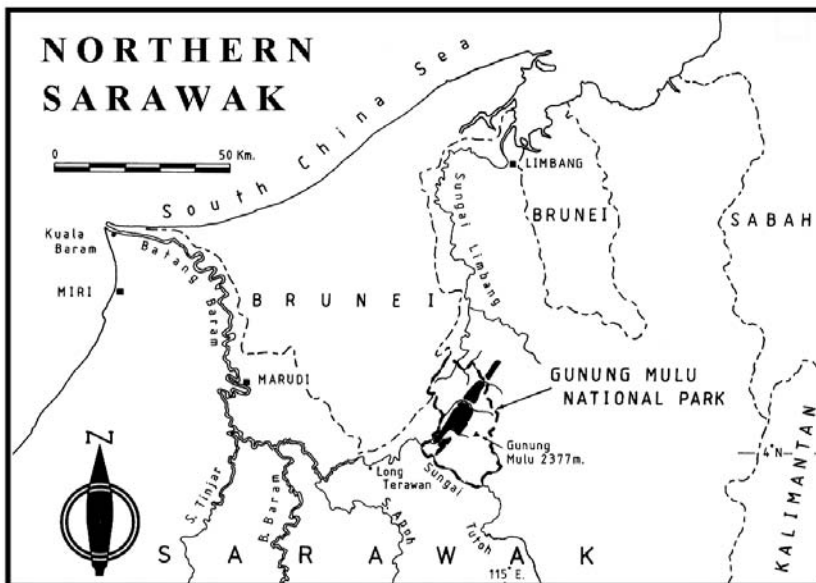


Figure 2: Northern Sarawak

As a result of the RGS expedition two large scale caving expeditions were mounted in the early '80s. The **'Mulu '80'** expedition explored and surveyed a further 50km of cave passages, including the largest underground cavity, in the world, 'Sarawak Chamber', which forms the final chamber of 'Lubang Nasib Bagus' or 'Good Luck Cave', (Eavis, 1981). The end of this chamber lies very close to the end of Prediction Cave in Hidden Valley and tantalising draughts at the end of each cave suggested a connection.

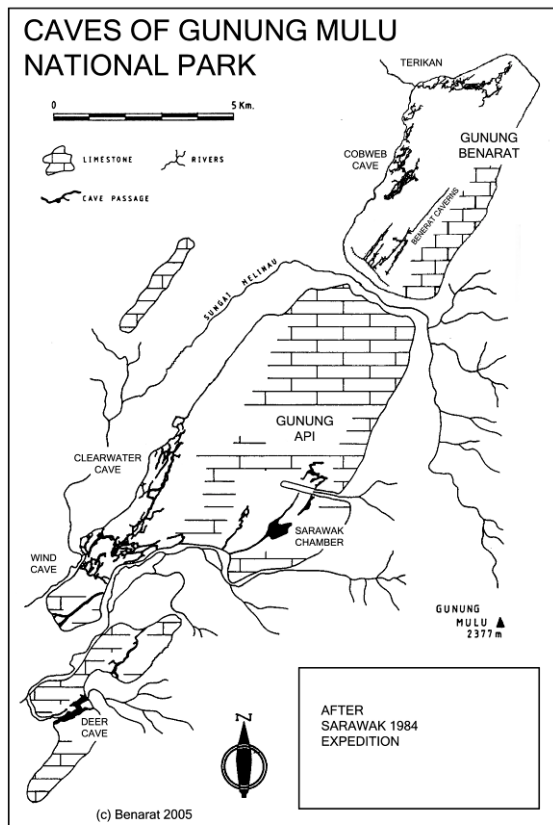
In 1984, the **'Sarawak '84'** expedition spent one month in the field and explored 54km of caves. Clearwater Cave was extended by 14km but a great deal of work was carried out in Benarat, where Cobweb Cave was discovered, adding a further 15km of passages to the Benarat total. Sarawak Chamber was also photographed for the first time.

These two expeditions carried out a great deal of scientific research associated with the caves, including dye tracing, geology, geomorphology, ecology, cave mineralogy, etc. However, although 150km of some of the largest caves in the world had been surveyed, some very significant areas of limestone remained totally unexplored, presenting enormous potential for further exploration, (Fig. 3).

During late '87 and early '88 plans were made to mount another caving expedition to the area. This would be the first expedition to visit the park since its opening to the public in 1985 and was primarily aimed at exploration, surveying and photography. Unlike the previous expeditions this was to be a lightweight venture with only six team members. The **'Mulu Caves '88'**, expedition once again proved the potential of Mulu with a further 16km of passages explored. It was also shown that exploration in Mulu using a small team was both feasible and successful.

The major discovery of this expedition was Blackrock Cave lying to the north of Clearwater and almost certainly part of the same system, (Kirby 1989, p.28).

As a direct result of this discovery, an eight strong group, including five of the 1988 team, returned to the Park exactly one year later as the '**Mulu Caves '89'** expedition. Once again a lightweight venture proved to be successful, with over 24km of passages explored and surveyed in only one month. Major extensions were found in Clearwater Cave, totalling 15km, and the gap between it and Blackrock Cave was brought to within 90m. The Clearwater 5 streamway was discovered and explored for over 1km.



**Figure 3: Exploration up to 1984**

In 1991 a group of nine explorers, five of whom were from the '88 and '89 expeditions, returned to the Park to continue exploration in the Blackrock/Clearwater area. A connecting passage was discovered which linked the two caves. This discovery made the Clearwater System the seventh longest cave in the world at over 102km. This was the '**Mulu Caves '91'** expedition, (Fig 4).

A vast amount of work had, by this time, been carried out on the western flanks of Gunung Api and although discoveries were by no means exhausted it was becoming increasingly difficult to find major objectives which would justify another expedition to that side of the mountain. The remaining significant lead, the Clearwater 6 Streamway, was weather dependent and, therefore, could not be relied on as a sole objective.

Attention now focused on the more challenging eastern flank of Gunung Api with Hidden Valley as the first objective. This area was less accessible than the west as there were no major rivers which could be used for transport of stores and equipment.

Tentative enquiries were made in 1990 to see whether it would be possible to visit the Valley during the '91 expedition. A positive response was received and this became one of the secondary aims of that expedition. Unfortunately this was not achieved as other discoveries closer to park

A new cave, provisionally named 'Simon's Cave', but later named 'Racer Cave', was discovered and explored and water tracing experiments proved a hydrological link from the Melinau Gorge through Blackrock and into Clearwater Cave, (Kirby, 1990). The discoveries made by these two expeditions had greatly altered the map of Gunung Api's caves.

During 1990 another British team visited the Park and continued the exploration of Racer Cave. The Clearwater 5 streamway was explored to an upstream sump. Although a sump bypass was found to lead into Clearwater 6, rain caused the bypass to sump which prevented further exploration (Weight, 1990). A physical link was established between Drunken Forest Cave and Alexandra Palace in Clearwater.

During February 1991 a Korean Team visited the Park. Some minor discoveries were made. Unfortunately these findings were not published.



headquarters took priority. Instead, part of the '91 team returned approximately one year later in January 1993 as the '**Hidden Valley '93**' reconnaissance expedition with the sole objective of carrying out a lightweight reconnaissance of Hidden Valley.

The reconnaissance expedition proved a success with potential for further discoveries to be made in the two known caves within the Valley and a new cave discovered in the dolines to the west. Other entrances were noted for further investigation and surface reconnaissance suggested even greater potential further south in the deeper 'Third Doline', which was not entered.

With the Hidden Valley reconnaissance expedition indicating potential for further discoveries in Hidden Valley a full exploratory expedition, '**Mulu Caves '96**', was mounted and returned to the Park in October 1996. A base camp was established within the Hidden Valley gorge between the entrances of Prediction and Wonder Caves. Although very little was found within the main gorge exciting discoveries were made in the dolines to the south west. Arch Cave was explored in the second doline. Prediction and Bridge Caves were found within the third doline and the fourth doline revealed Cloud Cave which matched Deer Cave in scale. During the last few days of the expedition a descending boulder ramp was followed which led into the far reaches of Cobra Cave. This established a through route to the Melinau Paku valley.

During 1997 an American expedition, which was exploring Gunung Buda, carried out surface searching on the northern slopes of Benarat. This led to the discovery of Deliverance Cave on the north east corner of the mountain. 3.5km of passages were explored which were heading in the general direction of Cobweb Cave.

With the success of the '96 expedition a second Hidden Valley expedition, '**Mulu Caves '98**', was mounted which returned to the Park in February 1998. As the centre of exploration was to be in the dolines it was known that this would not be best served by a camp within the Hidden Valley gorge. Not only would a camp in Hidden Valley be remote from the caves, it would also be almost impossible to supply without helicopter backup, which would be very expensive and could not be relied upon.

With this in mind, a gamble was taken on being able to reach the 4<sup>th</sup> Doline from the Melinau Paku Valley via a route, over the surface, which had never been explored. It was thought that the route through the caves would be used only as a back up, however, the severity of the climb up from Nasib Bagus, together with the surface terrain proved to be far more difficult than the underground route via Cobra Cave, which soon became the main thoroughfare.

This expedition proved a great success with further extensions in Perseverance Cave and a connection established between Cloud and Bridge Caves establishing the Cobra – Cloud – Bridge system at 16.1km. with a vertical range of 459m, the greatest vertical range of any cave in the Park at that time .

Owing to the El Nino year, river levels were exceptionally low so a further attempt was made to explore beyond the Clearwater 5 upstream sump into Clearwater 6. This led to another sump which was bypassed into Clearwater 7 and the inevitable upstream sump which was not passable. Hidden Valley would not be visited again by an expedition for the next seventeen years.

Another American expedition visited Buda in 2000 and carried out further work in Deliverance Cave, bringing its total length to 4.3km.

With exploration in Api now without any significant leads the attention of the British team was drawn to Gunung Benarat. It had been sixteen years since a British expedition had visited the mountain, during the Sarawak '84 expedition. The '**Benarat 2000**' expedition continued the exploration of Cobweb Cave, where a further 10.7km of passages were explored bringing the total length of the cave to 25.9km.

As a follow up to the 2000 expedition, the '**Benarat 2003**' expedition returned to the park. A further 4.4km were explored in Cobweb Cave, but the significant discovery of the expedition was made in Terikan Rising Cave where 12.5km of passages were explored. Included in the team were two Api veterans who were to use the expedition, based at Camp 5, as an opportunity to prospect the northern slopes of Api between the Melinau Gorge and Blackrock's Racer entrance. This revealed a significant entrance 2.8km south west of Camp 5. The cave was named Whiterock and within the remaining three days of the expedition it had revealed 3.7km of new passages. Owing to its proximity to Blackrock, it was thought that it would soon connect and might be of little significance.

During 2005, the '**Benarat 2005**' expedition, based at Camp 5, continued the exploration of Whiterock, which exceeded all expectations when a further 17.2km of passages were discovered, mostly lying above Blackrock. Two connections were made between the two caves, which linked Whiterock into the Clearwater System.

On the Benarat side of the gorge an attempt to climb up to an entrance high in the cliffs opposite Camp 5 was cut short when a small entrance was discovered only 60m above the ground. This cave was named Moon Cave and was explored for 6.6km in an almost straight line into the mountain. A connection was also established with Benarat Caverns making the total length of this system 16.4km

Included in the expedition were two divers who investigated the sumps in the Terikan system. This proved connections between the individual elements of the system to make a total length of 32.5km. Unfortunately an attempt to dive downstream in sump 4 to connect Blue Moonlight Bay Cave to Terikan System was unsuccessful as was the upstream sump 5 in Blue Moonlight Bay Cave which was dived to -53m and continued downwards without any sign of leveling out.

The total length of caves surveyed in Benarat was now 90.4km and in Api was 172.6km.

During January and February of 2007 the '**Mulu Caves '07**' expedition continued the exploration of Whiterock and Moon Caves. Significant discoveries were made in the northern section of Whiterock, where two major passages were discovered, both of which came to within 400m of Camp 5 with no apparent entrances/exits found. These two passages, the Northern Line and the 1954 Series, ran northwards in parallel with 60m of vertical separation.

A great deal of in-filling was carried out, with new passages providing short cuts between previously discovered trunk routes. This reduced considerably the travel times to the northern reaches of the system. These discoveries extended the known cave to 42.9km. A major success of the expedition was the connection of Moon and Cobweb caves via an unexplored passage in Moon Cave. This connection linked Benarat Caverns, Moon Cave and Cobweb Cave to produce the Benarat Caverns System, which ranks as the second longest system in the Park at 50.7km. In the Melinau Gorge, considerable surface survey work was carried out to tie together all the known caves on the Api side of the river and link these back to the datum at Camp 5. This allowed them to be linked into the Survex master dataset. Some minor entrances were explored in this area.

During January to March of 2009 the '**Mulu Caves 2009**' expedition continued to explore Whiterock Cave and discovered a further 24km of passages. Owing to the proximity of the northern passages to

the cliffs in the Melinau Gorge, a considerable amount of effort was given to establishing a northern entrance. Five days were spent attempting to gain entry via a small cave to the east of Camp 5. Unfortunately this ended in a boulder choke with a draught emitting, within 100m of Whiterock. A significant discovery in Whiterock brought its northern passages to a point underneath the Pinnacles track and even closer to Camp 5. Late in the expedition a steeply descending ramp off 1954 led into the Whiterock River, the upstream continuation of Clearwater streamway. Although not fully explored, this streamway was left at a point 60m beneath Camp 5 with potential for further discoveries.

During May 2010 a small team visited the Park. The '**Mulu Caves 2010**' expedition was to be a small-scale venture, based at Park headquarters, with the aims of photography, science and surveying. Modern digital images were made of the caves close to Park headquarters. Further samples of speleothems, sediments and quartz were collected to enhance the scientific programme. 14.6km of surface survey was completed to tie together all the known entrances in the Southern Hills. Although not a primary aim of the expedition, a small amount of exploration was carried out, with 2.4km of previously undocumented caves explored and surveyed.

During 2011 the '**Mulu Caves 2011**' expedition spent two months in the field. This was a two-centre, two-month expedition the first month based at Park HQ and the second at Camp 5. The expedition successfully laser scanned the vast Sarawak Chamber allowing volume calculations for be made. Radio-location was used in Whiterock Cave and the Melinau Gorge to determine the precise position of the end of the cave in relation to the surface topography. A series of Geodetic GPS fixed points were established around the park to better understand the relative levels of the caves within the Survex dataset. In Whiterock Cave 13km of new discoveries were made. A series of sampling was carried out for Uranium series dating.

The '**Mulu Caves 2012**' expedition was to be the 20<sup>th</sup> in the series of Anglo-Malaysian ventures and was based at Park HQ. A series of high level caves were found in the Melinau Paku valley with Train Cave extending the Cloud/Bridge/Cobra system to 20km. Attempts to connect Lagangs Cave into Racer Cave were unsuccessful but the cave was extended to 5.7km

October 2013 saw the '**Mulu Caves 2013**' expedition based at Camp 5. Scientific work was carried out in Whiterock cave to better understand the geology and geomorphology of this area. Further sampling was carried out for uranium series analysis. A further 7km of new passages were explored in Whiterock Cave and Deliverance Cave at the northern end of Benarat was re-visited without any major breakthroughs.

During April/May of 2014 the '**Mulu Caves 2014**' expedition was focused on exploration at the southern end of Gunung Api. Based at Park HQ the expedition continued the attempt to connect Racer and Lagangs cave into the Clearwater system. Although the connection was not made a new cave was discovered, Easter Cave which proved to connect with the higher levels of Racer Cave. The significant success of the expedition was to discover the 8km of passage in the Creedance series which forms the fourth horizon of development 450m above base level confirming the existence of higher levels within the cave. This discovery pushed the total length of the Clearwater System to over 200km.

The '**Mulu Caves 2015**' expedition was an ambitious project centered on three locations, Southern Api, Hidden Valley and Camp 5. In Hidden Valley a lightweight recce was carried out to investigate a large entrance identified from helicopter video footage in the north wall of the gorge. This revealed Conviction Cave which connected into Wonder Cave, unfortunately a serious accident curtailed some of the work here. Further exploration was carried out in Racer and Lagangs caves but



no connection made. From Camp 5 8,065m of new passages were explored in Whiterock Cave where a new level was entered 100m above anything previously discovered. This was 380m above the lowest part of the cave confirming the existence of higher levels within the cave and potential for far more discoveries in the future.

During April 2017 the '*Mulu Caves 2017*' expedition visited the park and was based at Park HQ. Further work was carried out in southern Clearwater and in Cave of the Winds where the Eureka series was discovered lying just above the river passage. Once again determined efforts to connect Lagangs Cave to Racer were unsuccessful but a radio link was made near a small sump in each cave indicating that this was potentially the opposite sides of a connecting sump.

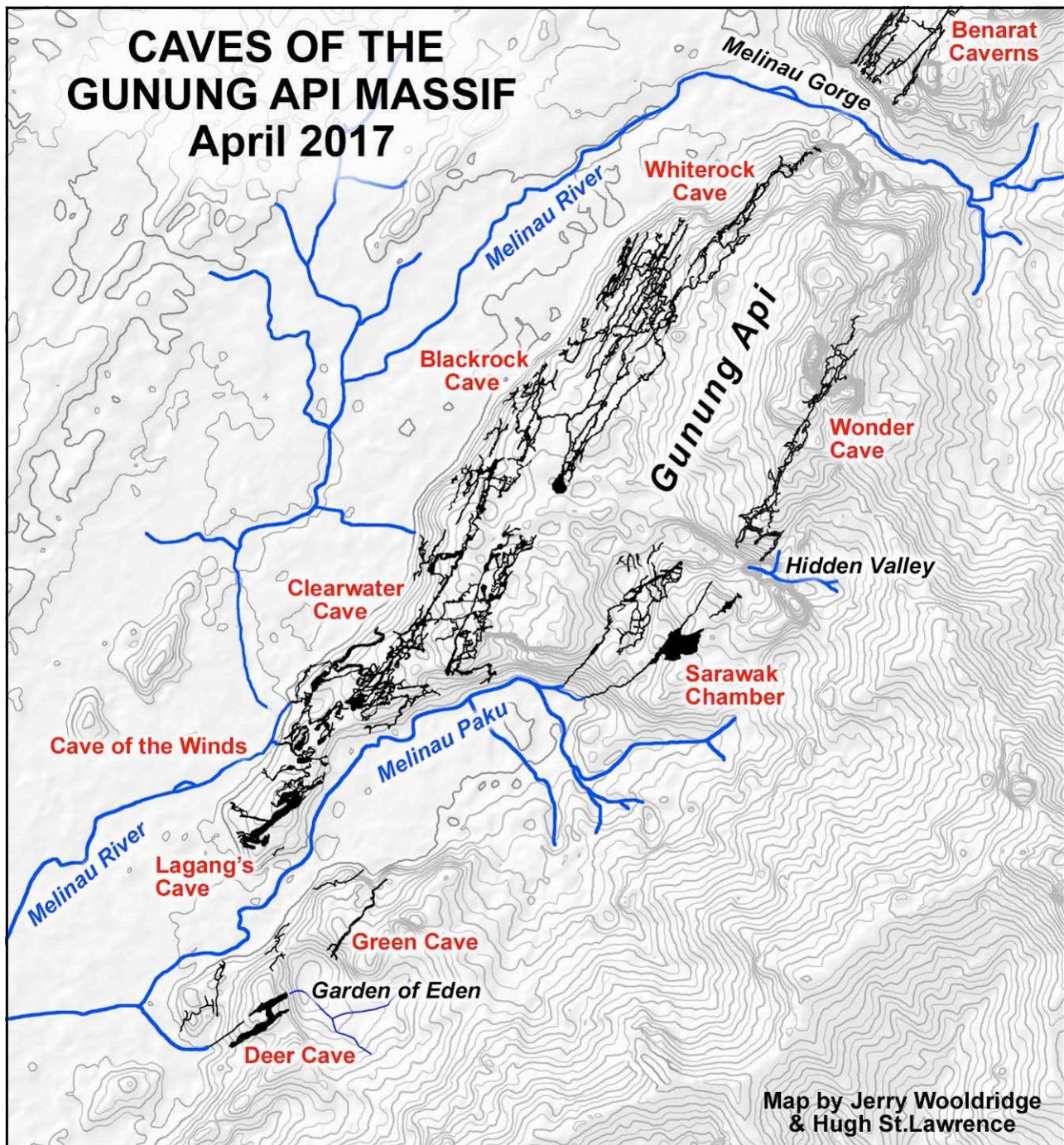


Figure 4: Caves of the Gunung Api Massif after the Mulu Caves 2017 April Expedition

# **THE MULU CAVES 2017 OCTOBER EXPEDITION**

## **BACKGROUND TO THE EXPEDITION**

Over the fourteen years since its discovery in 2003, Whiterock Cave had provided a feast of exploration. With a total length of 96km there was great potential for this expedition to push the total over the 100km mark. During the 2014 expedition discovery of a fourth horizon of development in Clearwater, at 490masl, indicated that there was potential for the same level of development in Whiterock. Although a short section had been found at almost this level (Swift Progress) this was relatively close to the edge of the mountain and broke to surface. Previous expeditions had searched for higher development deeper into the mountain without success but there was always the possibility for a breakthrough.

During the April 2017 Hidden Valley expedition, led by Dave Nixon, Wonder Cave had been pushed northwards past the summit of Api heading single-mindedly towards the Melinau Gorge. Unfortunately no easy leads were left but it did indicate the possibility that Wonder Cave may pop out from the cliffs of northern Api. Investigation of a video sequence taken from a helicopter flight around Api indicated a dark shadow high on the cliffs above Penan Pot Cave on line with Wonder Cave. This had the potential to provide a northern way into the Wonder Cave extensions.

## **OBJECTIVES**

Although the team were all based at Camp 5 there were two distinct teams with very different objectives:

1. **Whiterock Cave, led by Mark Brown:** to continue the exploration of this cave with potential for gaining access to the elusive fourth horizon.
2. **Wonder Cave, led by Dave Nixon:** to investigate a large black feature high on the Api cliffs, which appeared to be in direct line with the projected end of Wonder Cave, with the aim to gain access to the Wonder/Conviction system from the north.

## **ACCESS TO THE CAVES**

### **Access to Whiterock Cave**

Whiterock's entrances are located on the northwest flank of Api just to the south of a prominent north facing white cliff. The normal route to the cave follows the Headhunters Trail south from Camp 5 to a point mid way between the 4km marker and the first river crossing. From there a cut track heads across swampy land to the Midnight entrance.

The first trip was simply intended to take camping and other equipment into the cave. Despite some treefall, quick progress was made to the cave entrance - beginner's luck perhaps? On the return journey the track proved more challenging and after a few hours wading through rattan, the team emerged on the river bank near the second suspension bridge. The first exploration camp also had issues with route finding to the cave, taking some 7 hours from camp 5 to the entrance. The exit from this camp was made early in the morning to maximise daylight, and a usable track was finally established, and solidified the next day with assistance from Venno. This track emerges somewhat closer to the suspension bridge than previous expeditions'.

### **Access to the Wonder Cave Feature**

Access to the caves on the Api side of the Melinau gorge is gained by following the track eastwards from Camp 5 past the Melinau bridge and the bathing pool. This track continues beside the river for approximately 750m until it is terminated by cliffs which come down to meet the river. A hundred

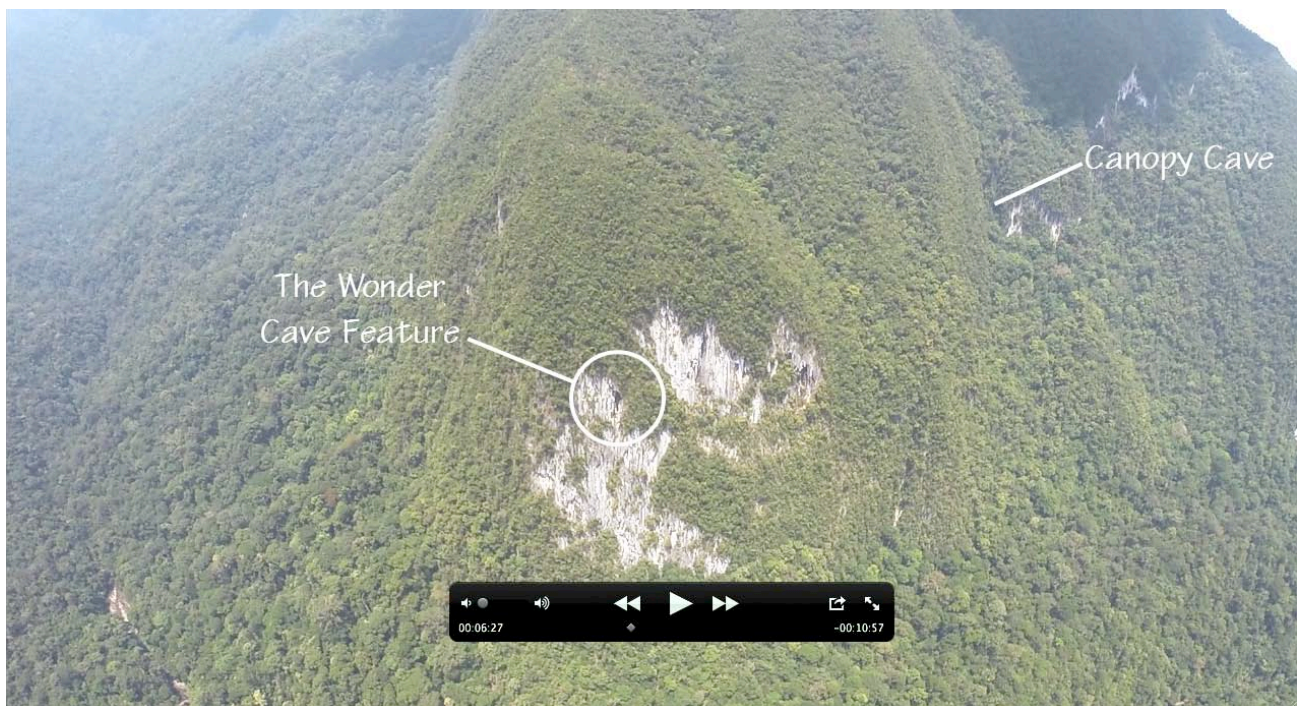


or so metres before here, another track on the right leads south eastwards, just after a section of path that follows the bathing pool stream. This track is only occasionally used and is not well marked although there are a few pieces of old red flagging tape. The route traverses up the flank of an alluvial spur with the ridge to the left and the bathing pool stream which can be heard below on the right.

Eventually the track reaches a col and onwards from here streams drain to the east. Tree Cave is over to the right from here. The track continues to follow the ridge for a short while then drops down to cross a stream which takes drainage from the small valley where Tree Cave, Rock Shelter are found upstream to the right. The track traverses the slope at the foot of the Melinau Gorge cliffs through a gap between rocks before crossing a further small stream. It then goes up a gully and through a col across another spur. Beyond here a slope descends past pinnacle cave on the right to a relatively flat area with a series of caves at low level on the right. The first obvious entrance is Bat Cave, a significant dry entrance containing bats and much guano. Onwards from here the track continues to follow just out of sight of the base of the limestone past Rat cave and Frog cave on the right reaching the stream from an obvious resurgence on the right 200m beyond Penan Pot Cave. The route to the Wonder Cave feature climbs from the resurgence pool up the scree to the foot of the cliffs. The climb started by following the cliff line to the corner of Api where a high point could be reached on the scree from where the bolt climb could start. The climb proceeded with alternately diagonal and vertical pitches gradually rising westwards to the feature. On the descent, the lower half was rigged as a series of vertical abseils landing at the point where the scree path first met the cliff line.

Back at the resurgence pool, the track continues to skirt round the corner of Api passing White Rift Cave and a wade across the resurgence stream. The last known cave along here is Pinnacle Cave No. 2, which is right on the corner of the limestone.

The Wonder Cave feature is between White Rift Cave and Pinnacle Cave No.2 and is visible through gaps in the trees at the resurgence.

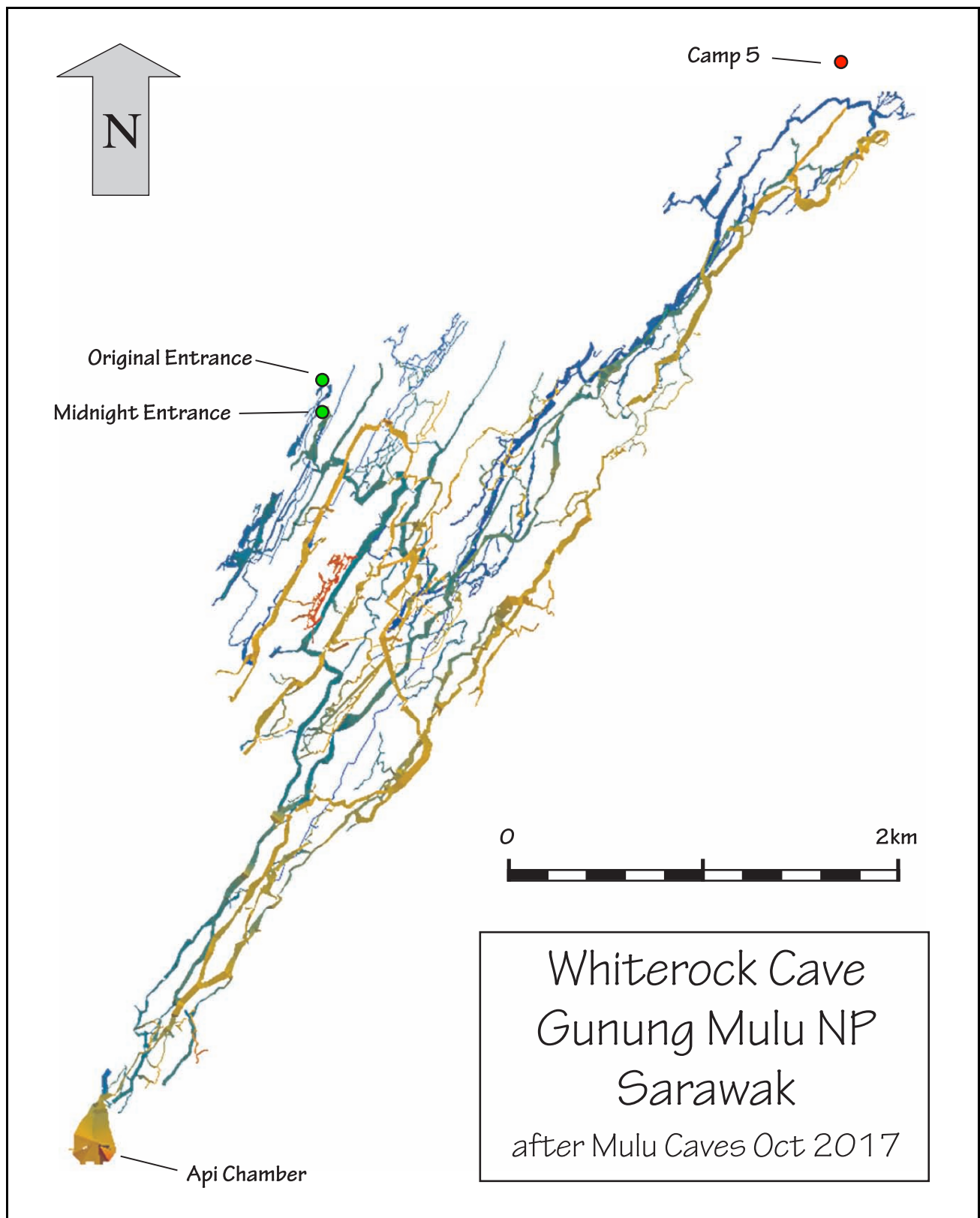


*Screenshot from the heli fly past video showing the cave feature and relative position of Canopy Cave*



## SUMMARY OF UNDERGROUND EXPLORATION

### Whiterock Cave



With a five person team, four trips were made into Whiterock Cave, all with overnight stops at Propeller Camp. Two-night stops were made for the first two trips and three-night stops for the second two trips. The group split into two teams to maximise efficiency and cover as much ground as possible.

An effort was made to access the elusive fourth horizon with bolt/ramp climbs out of Strong Hint of Business and Api Days. Further work was carried out at low level with passages explored close to river level and connections to Perfect Mulu Manners.

Exploration was carried out at the following sites as named in the Survex files:

- **Phreas a Bird**: off Api Birthday
- **Youth of Today**: off Ancestors near Propeller Camp
- **Uncharted Engineers**: off Uncharted Waters
- **Overture**: off Strong Hint of Bigness
- **Stairway to Heathen, Roaring Crawl, Ruse of the Valkyries, Tons Pitch, Unexpected View**: all off Strong Hint of Bigness
- **101**: off Whiterock River South connecting to Redemption
- **Overlook**: off Perfect Mulu Manners connecting to Redemption
- **Redemption**: off Whiterock River South via 101
- **Gone in 60 Metres**: off Gone with the Wind Rift (in the far north of Whiterock)



*Propeller Camp, the starting point for many Whiterock trips*

*Tom Smith*

### Access to the Strong Hint of Business (SHOB) and Api Birthday areas from Propeller Camp.

Steep ramp on up east side of passage, a short distance north of the camp (handline for first section) slopes up to an awkward steep tube, which soon breaks out into a larger junction (SHOB stn 34). Continuing up the bed here breaks into a horizontal passage which is followed south until it breaks out on the edge of a scree slope funnelling down to a pitch. This overlooks the passage just south of Propeller Camp. Climbing up cobbles tight to the north rim of the funnel enters the wide flat-floored passage of SHOB heading south.

A descending traverse across the funnel slope leads to the pitch edge. An in-situ traverse line (rigged 2017) leads via an awkward couple of moves around a nose of rock to a loose slope up into the Api Birthday passage heading south west. The main Api Birthday passage rises up to an area of breakdown, where it appears at first glance to close down. Here there is a small climb up through dripping stal to a talus-slope floored chamber at the base of the Api Daze Ramp; this overlooks the continuation of the Api Birthday from a ledge. (The southern continuation of Api Birthday is gained from before the passage breakdown, via a scramble down to the west and a crawl through boulders, which pops out below the Api Daze ramp/chamber).

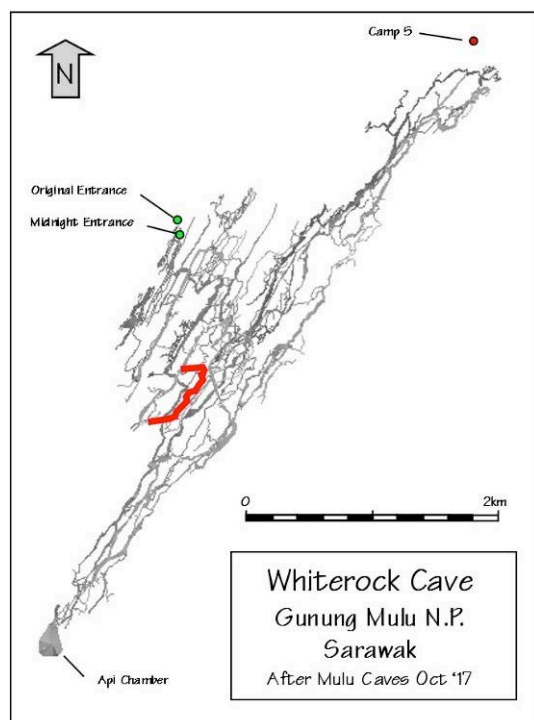
### Api Daze Ramp, extension not surveyed, explored 15 Oct '17

Explored by Jethro Pryke, Helen Fairclough, Tom Smith & **Mark Brown**

Previous expeditions had climbed the Api Daze ramp but there was a hint of a continuation at the top. Armed with the knowledge of the existence of the 'fourth horizon' the 2017 team chose to give it another look. At the top of the sloping ramp a vertical section of popcorn-encrusted boulders was reached. Climbing this for approximately 10 metres led to a point where it narrowed into impenetrable slots.

### Phreas a Bird, length 1,124.15m, explored 19 Oct '17

Explored by **Mark Brown**, Tom Smith & Rostam Namaghi



A few metres back north from the climb up to Api Daze chamber, a climb over a spiky calcite-encrusted boulder and under a low arch finds a rift heading east with a branch back into the Api Daze chamber. Following the rift up and down a few short free climbs, it breaks into a passage heading south west along the strike (on the Ancestors Passage bed at a higher level).

This is 'Phreas a Bird', which follows the strike via several technical traverses and climbs up and down. Several parallel passages and windows join in and out of the top of the passage and an interesting 'drinking fountain' spout is passed. The way on eventually dips down the bed to an awkward 4m climb down, then a muddy crawl and further ramp down. The crawl has passed right under the Daydream Believer passage then slopes up a short way to the base of a black coated bouldery waterfall. The waterfall looks on Surverx to be from the pitch down at the end of Api Dreams (explored in 2013)

and disappears into boulders at the base of the 4m climb.

*See survey on page 36*



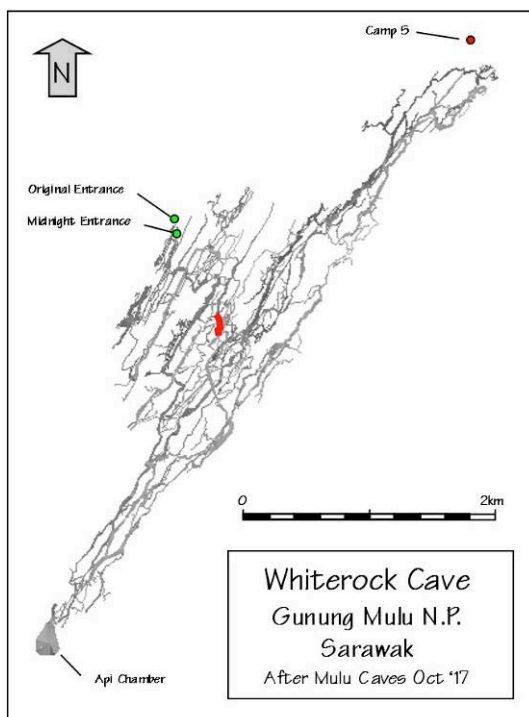


*Helen drinks from the waterspout in Phreas a Bird*

*Tom Smith*

**Youth of Today**, length 95.55, explored 20 Oct '17

Explored by Tom Smith, Jethro Pryke & **Helen Fairclough**



*Up the slope to the south of Propeller Camp, past the northern entry point of Ancestors Passage, leads to Green Wing. It was realised that the obvious open continuation of the passage south had not been surveyed from this point.*

This continues as a slowly ascending passage which eventually widens in a well decorated chamber. At the top of the chamber, a drippy rift is entered which soon closes down.

*See survey on page 37*



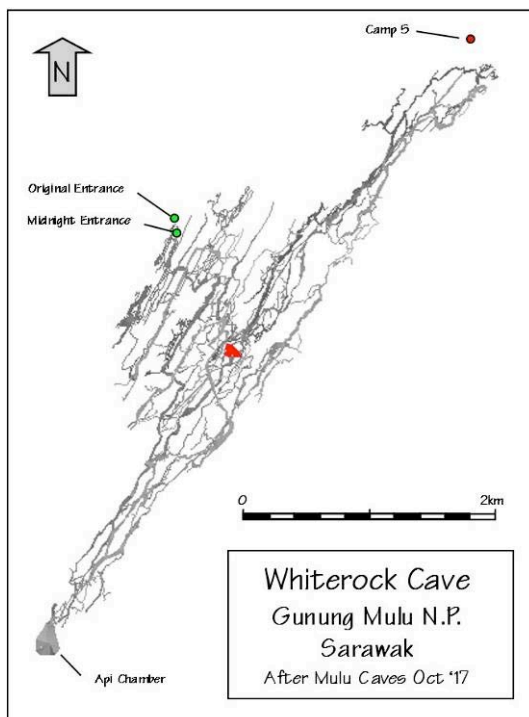


*Tom Smith in Youth of Today*

*Helen Fairclough*

### **Uncharted Engineers, length 219.74m, explored 22 Oct '17**

Explored by **Helen Fairclough**, Tom Smith, Jethro Pryke



*Unnamed Bypass is the route to gain the southern continuation of Strong Hint of Bigness from Propeller Camp (the main route south from the start of SHOB reaches a deep pit and pitch up which would require rigging). Uncharted Waters had previously been explored up the bed from the half way point of Unnamed Bypass and left with an ongoing lead. Uncharted Engineers pushed on with this passage during the 2017 expedition.*

Heading into Uncharted Waters, a substantial blind pit marks the left turn into Uncharted Engineers. The passage immediately heads upwards, passing a window overlooking the main Uncharted Waters passage. A short section of more constricted ramp emerges at a junction. To the right is a muddy passage leading to an aven, this was free climbed for approximately 5m, but ropes would be needed to make further progress. Left at the junction, the passage continues to ramp upwards, and zig-zags up



the bedding, past some drippy and muddy sections. Another junction is reached shortly before the top, to the right a calcite squeeze gives access to a well decorated final chamber. To the left the passage ends in formations but could potentially be enlarged.

*See survey on page 38*



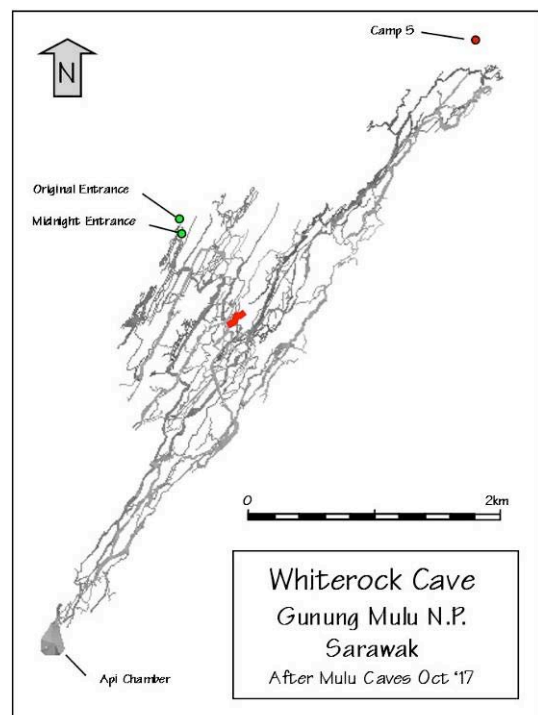
*Helen Fairclough at the well-decorated end of Overture*

*Tom Smith*

**Overture**, length 216.58m, explored 23 Oct '17  
Explored by **Tom Smith & Helen Fairclough**

Located right at the start of Strong Hint of Business, at the Propeller Camp end, a window on the north east wall can be accessed by a 13m bolt climb up a large hollow flake to an ascending ramp with a good draught and many swiftlets. The 3-5m wide passage ascends and passes a blind ramp down to the left, before a smaller section opens into a final well-decorated chamber where the draught issues from small holes in a calcite and sand choke.

*See survey on page 39*



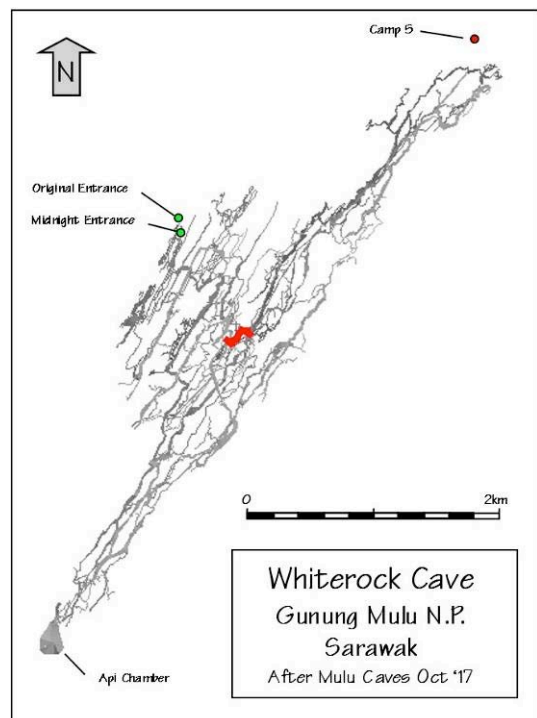


### **Stairway to Heathen, length 427.76m, explored 23-24 Oct '17**

Explored by Mark Brown, Rostam Namaghi, **Jethro Pryke**

*From Stn 87 in SHOB there is an offshoot passage North (this looks to be the same passage as 'Youth of Today' by propeller camp, but is blocked by breakdown. Descending several climbs in this passage leads to a junction at SHOB stn 118 with a massive boulder in the centre. A dark walled ramp passage with a trickle of water can be seen leading off to the south east.*

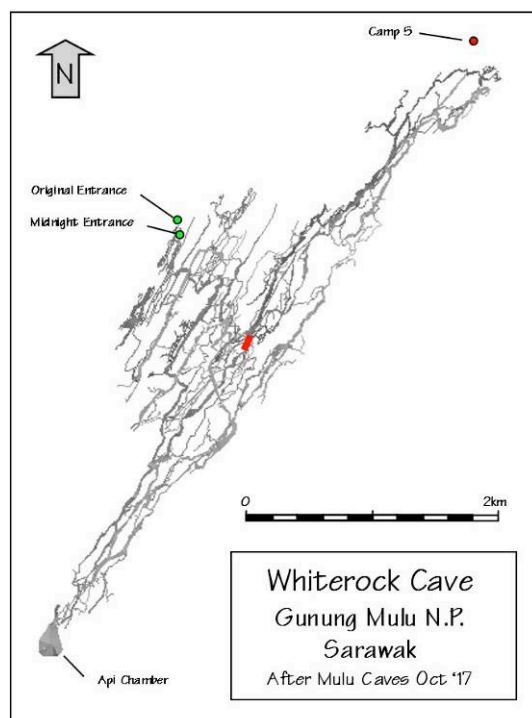
From Strong Hint of Bigness a ramp leads uphill to a junction after 50m. Right leads around some pillars to a short climb back down into SHOB. Left goes through a short sharp crawl which opens up to stooping passage. This continues to a junction - left leads to a 10m pitch (Tons Pitch) and right leads up a slope to another junction. Left leads to a 15m pitch (Ruse of the Valkyries) and right is a crawl around stals to a popcorn-covered 10m climb up to a ledge that is surrounded by stals. This continues as Roaring Crawl.



*See survey on page 40*

### **Roaring Crawl, length 65.79m, explored 23-24 Oct '17**

Explored by Rostam Namaghi & Mark Brown (written by **Jethro Pryke**)



From the ledge in Stairway to Heathen the passage goes up a further 10m pitch to a tunnel of painful flat-out crawling with a strong incoming draught. This keeps narrowing to a small hole that is impassable. The draught coming through the hole sounds like a jet engine due to the speed of the flow.

*See survey on page 40*

### **Ruse of the Valkyries**, length 69.21m, explored 24 Oct '17

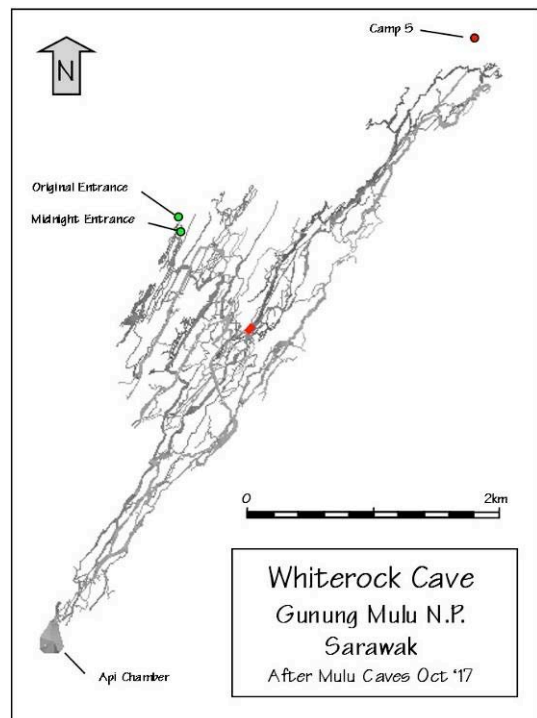
Explored by Jethro Pryke, **Helen Fairclough** & Tom Smith

Left at the junction below the bolt climb up to Roaring Crawl a gravelly crawl enlarges quickly to a short walking passage to a 15m pitch (bolts) with exceptional acoustics.

At the base of the pitch, a short ramp leads down to a walking passage with many stalagmites and helictites that look like the horns of Viking helmets.

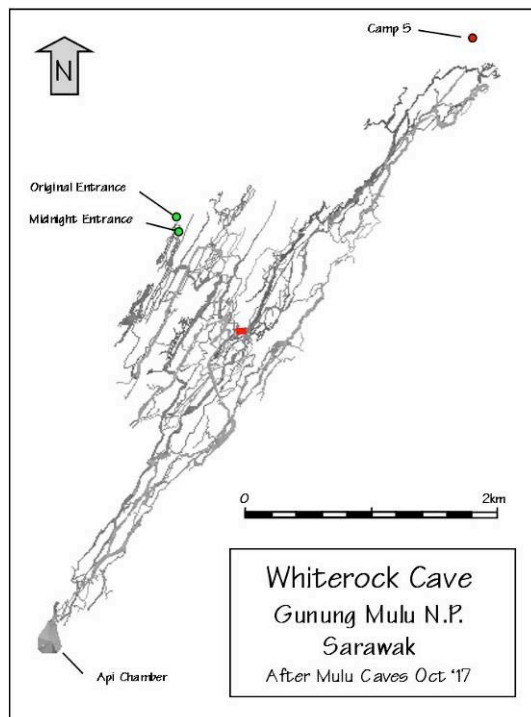
The passage continues, through a calcite squeeze until it reaches a hole in the roof overlooking the decorated chamber in Tons Pitch.

*See survey on page 40*



### **Tons Pitch**, length 110.36m, explored 24 Oct '17

Explored by Jethro Pryke, **Helen Fairclough** & Tom Smith



In Stairway to Heathen a large boulder marks the entry to Tons Pitch. The passage drops behind the boulder and quickly arrives at a 10m pitch into a mud floored passage which emerges on a ledge overlooking a well decorated chamber. Climbing off the ledge, a small 1m x 0.5m draughting hole in calcite on the right side of the chamber leads to a junction with a small passage - left is a low crawl, while to the right are two undescended pitches. Back in the main chamber, at the far end is an archway leading to another chamber with an undescended pitch of approx. 20m.

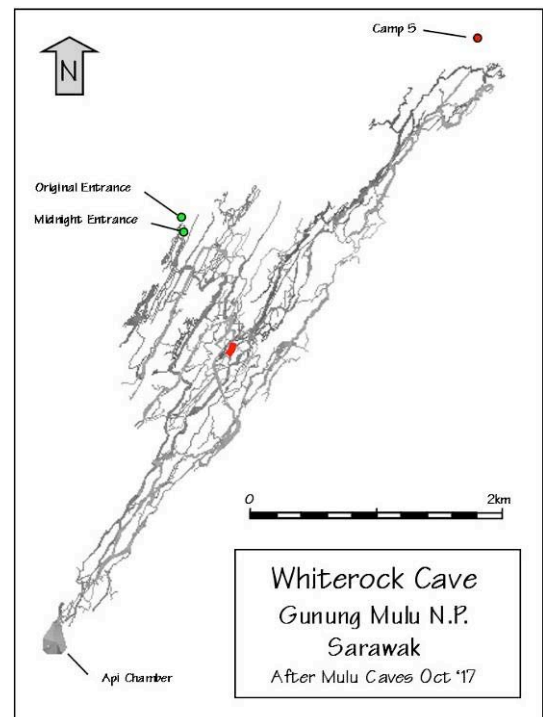
*See survey on page 40*

### Unexpected View, length 63,42m, surveyed 24 Oct '17

Explored by Jethro Pryke, **Helen Fairclough** & Tom Smith

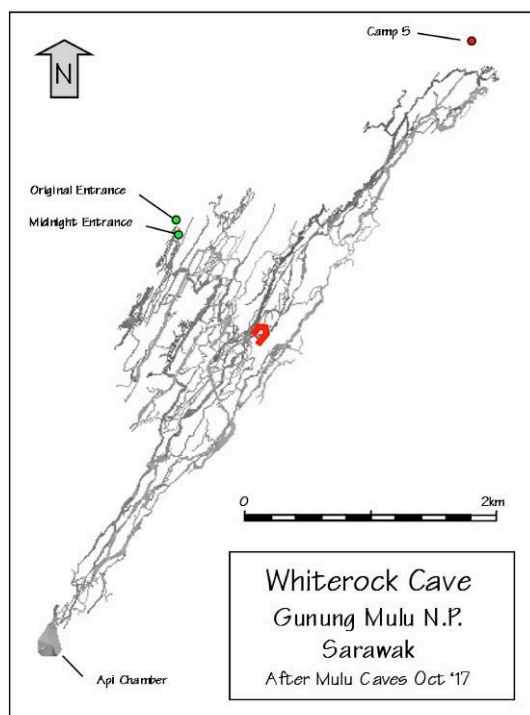
From station 87 in SHOB a ramp goes up to the South East which was previously explored to the base of a climb. This climb was passed in 2017 with the aid of a short handline. This lead to a passage heading north which climbed gently then descended over a calcite floor to join the head of the initial ramp in Stairway to Heathen.

*See survey on page 40*



### 101, length 469.29, explored 27 Oct '17

Explored by **Helen Fairclough** & Tom Smith



101 is the original entry passage to the fine Redemption passage and takes off from stn.54 in the Whiterock River, opposite the end of Centurion (7m pitch into river). Traversing a mudbank behind the stn.54 cairn leads past a blind ramp on the left and heads east through small chambers with remarkable wind-blown stalactites until the passage makes a steady 180 degree turn to head back west in a large sloping bedding plane with a false floor of boulders providing level going. Twenty metres along the bedding a draught is felt coming down from the left - this is the start of a 50m ramp climb (rope required) up into Redemption and Overlook.

Past the base of the ramp continues along the bedding and over a mud bank where the passage changes character and becomes a clean washed phreatic tube. Just beyond a 5m climb a low crawl leads off on the left (unexplored). Ahead the passage ducks under an arch to a mud bank above a shallow canal which

appears to sump at both ends and has little if any flow. To the right the mud bank passes further sections of canal until a climb up boulders to the right lands back in the main bedding level near the Redemption ramp.

*See survey on page 41*





*Wind-blown stalactites in 101 Passage*

*Helen Fairclough*



*The ramp up to Redemption & Overlook from 101*

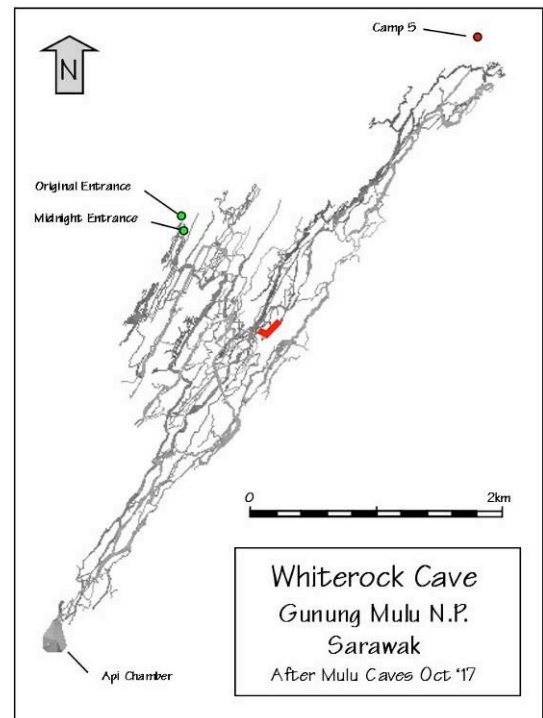
*Helen Fairclough*

**Overlook, length 485.82m, explored 29 Oct '17**

Explored by Rostam Namaghi & **Jethro Pryke**

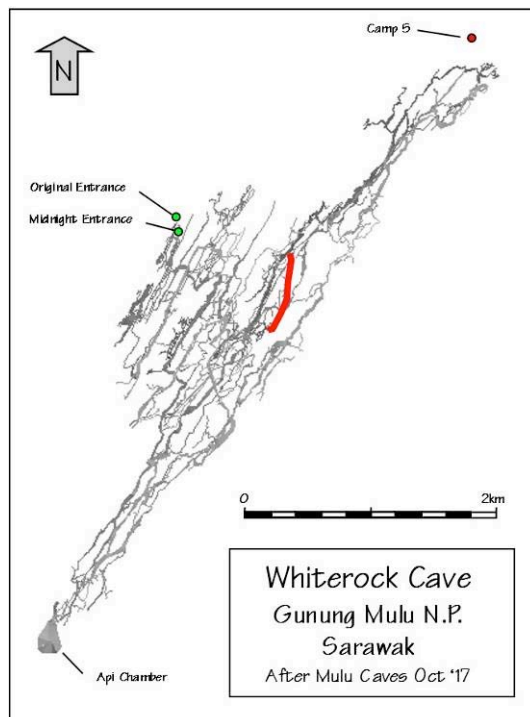
From the top of the ramp climb from 101, a T-junction is reached. To the left is Overlook. Ducking under the low roof is a calcite floor and another T-junction. Right is a very pretty tube which swings right to emerge in Redemption. To the left the passage narrows and then opens out in a small chamber and a short climb down into a bigger chamber. On the left at the base of the chamber is a crawling tube which loops back to the small chamber at the head of the climb. Ahead in the main chamber is a large muddy, bouldery ramp that is quite loose and slippery. Clambering to the top reaches level going in a short passage that swings right to join with Perfect Mulu Manners.

*See survey on page 41*



**Redemption, length 805.22, explored 29 Oct '17**

Explored by **Helen Fairclough** & Tom Smith



From the top of the ramp climb from 101, a T junction is reached, turning right here is Redemption passage. This begins as a large sandy floored passage. After 40m a passage slopes downwards to the left and becomes a crawl which rejoins Overlook. On a ledge to the right here is a passage which turns back on itself and becomes an upwards sloping tube with a draught (unexplored).

Back in the main passage, the floor becomes boulders and two parallel passages with windows between them rejoin at a drippy chamber. The passage then returns to a sandy floor, with periodic clean washed streaks. After another 150m, the passage goes under a low arch and into a large triangular chamber. From here the passage again splits into two parallel passages. The left has an impressive calcite false floor. A low crawl splits off from the right passage. The passages rejoin and two passages appear to split off at roof level (~10m bolt climb required), at approximately this point the draught is lost.

The passage continues past a 2m high cobble wall, up a boulder floored ramp which ends atop a pile of boulders in a chamber. On a low ledge at the bottom left of this chamber is a passage



leading to a climb up. Straight ahead at the chamber a sandy ramp leads down, until the roof almost reaches the sand and the passage terminates in a flat out crawl which is blocked by formations.

*See survey on page 41*



*Rostam Namaghi with a skeleton found in Redemption*

*Helen Fairclough*



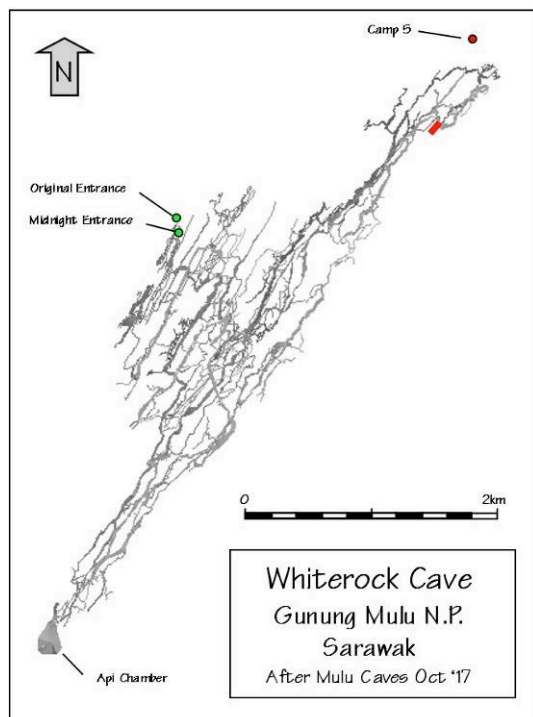
*Delicate stal at the end of Redemption*

*Helen Fairclough*



## **Gone in 60 Metres, length 84.58m, explored 27 Oct '17**

Explored by Jethro Pryke & **Mark Brown**



Gone With The Wind Rift is in an enticing location off a zig-zag bend in the main Gone With The Wind passage, appearing to head south west along the strike into blank space, with a draught. Exploration in 2011 had been stopped by a very steep mud slope embedded with a large detached flake, which would require a climb to overcome.

Two members of the 2017 team embarked on along day out from Propeller Camp for their first visit to the northern end of Whiterock. Having checked out the sights en-route to Pointless Junction and the spectacular long and wind-blown straws in Gone With The Wind, the team arrived at the steep, muddy slope at the foot of the climb with a lightweight Bosch Uneco drill and plenty of rope.

The large flake overhung the rift and doubt about the security of the large block perched at the top meant a bolt climb up the passage wall alongside was chosen. Six bolts gained a stance on top of the flake, where a

15m traverse along the top of the flake led to a pitch back down. The 3m wide rift continued up 10-15m overhead at this point with no evidence of passages leading off.

Deviations and rebelay continued down a series of short drops and muddy slopes. Finally, a 1m diameter muddy tube descended to a conclusion in a small, muddy chamber, at a lower elevation than the main Gone With The Wind passage.

It was hypothesized that the rift was just a minor phreatic enlargement along the strike (where the main flow along the Gone With The Wind Passage had taken a zig-zag to the West) and that the draught was circular in the first part of the rift.

*See survey on page 42*

## SURFACE SEARCHING

### Alcoving: The Search for Wonder Cave

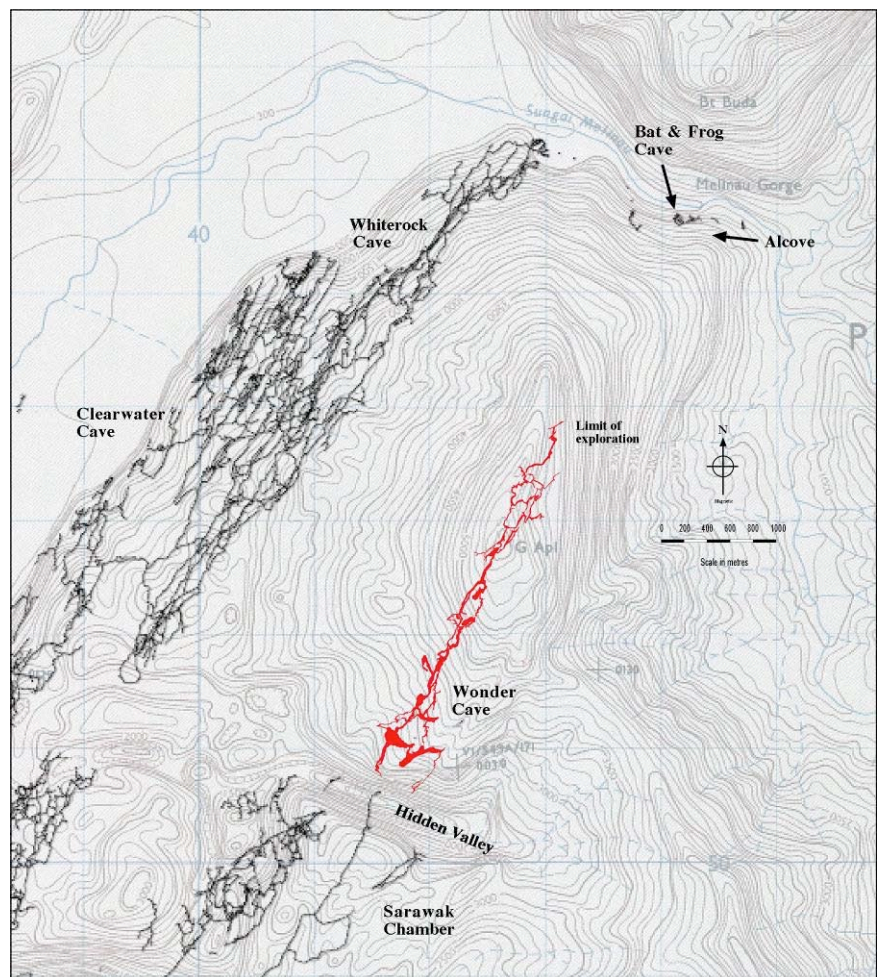
Investigated by **Dave Nixon**, Pete Hall & Colin Boothroyd

The various Hidden Valley expeditions over the years had revealed mainly cave development in a southerly direction and the possibility of a through trip from here to the Melinau Paku by a traverse of Bridge/Cloud and Cobra caves. It wasn't until the 2015 trip where it was discovered that the cave development and hydrology was equally as interesting in a northerly direction. Conviction Cave and subsequent connection with Wonder Cave extended the system to a total of 18km, in large scale passages which were developed by water flowing north to the Melinau Gorge. The limit of exploration was approximately two thirds of the way through Gunung Api and the strong indication that the water flowing in the system was destined to re surface at the previously documented 'large resurgence' east of Bat, Frog and Rat Caves in the Melinau Gorge.

Lying 230m above this immature development on the valley floor was a feature in the cliff which not only was on the correct elevation as the main development in the far reaches of Wonder Cave but was directly in line with the overall northerly development of the passages in the cave.

The plan was set and a three man team consisting of Colin Boothroyd, Pete Hall and Dave Nixon were added to the team visiting Camp 5, with the sole purpose of aid climbing up the most south easterly cliff face in the Melinau Gorge.

The trail to the area is actually the trail which eventually traverses the east side of Gunung Api and leads to the Hidden Valley following the edge of the limestone most of the way. Immediately west of the resurgence a trail was cut steeply up the boulder slope to the foot of the cliff and an even higher location was found possible to achieve by following the base of the cliff to the point where it turns south. This was the true starting point for the climb.



*Alignment and position of Wonder Cave relative to the 'Alcove' feature*



Over a period of six independent days a route was ungracefully pushed up towards the target, which lay out of sight for virtually the entire time on the face. The only brief respite was a small ledge approximately 150m up where it was possible for the whole team to sit in comfort without hanging in a harness and as an added bonus there was a small trickle from which water was gathered.



*Colin and Pete hang from a belay high above the Melinau River*

*Pete Hall*

The final approach to the large smooth scalloped overhang was an overhanging aid climb diagonally downwards to a point where a full view of the ancient cave passage was possible. Unfortunately although there was a mature passage which had been incised by the down cutting of the gorge, it was sadly blocked completely by flowstone and stalactites and stalagmites. Pete and Colin were bolstered with the thought that we had possibly discovered one of the world's remotest and hidden alcoves though Dave Nixon had difficulty sharing their enthusiasm.

A retreat was made at this point. No other features were encountered that were worthy of investigation.

The final trip to the cliff was spent pulling through the ropes and de rigging all the climbing equipment back to C5, with the help of our two loyal and dedicated porters.

Before departing back to the park headquarters a day was spent looking at Frog and Rat Caves as the water levels weren't too high. Unfortunately no new observations were made here either to indicate an easy low level way into the 2km gap between here and the closest part of Wonder Cave. There was no draught at 'Sugar we're going down' (Wonder Cave) which is 120m higher



than Rat Cave, however there was a strong northbound draught in the high level route at 'Takes the Biscuit'.

Although no dye test has been conducted it is strongly believed that the water from the Wonder



Cave system, and probably also the other water falling on the north-eastern corner of Gunung Api, heads north and reappears at the obvious resurgence near Penan Pot Cave in the Melinau Gorge. The water flowing within Wonder Cave all heads north and within the fossil passages there is imbrication and scallop marks to indicate that water in the upper passages also flowed north.

There is no evidence from studies of the known caves, and from the current understanding of the geology in the north eastern corner of Gunung Api, to suggest that within the last 2 kilometres (between the end of Wonder Cave and the Melinau Gorge) that the water would find a course that would lead it to turn and head south to join the waters resurging at the Clearwater resurgence or those resurging in the Melinau Paku.

*A large Pit Viper encounters Moose*

*Pete Hall*

However, it is interesting to speculate that perhaps, in former times, the Wonder Cave waters resurging towards the head of the Melinau Gorge flowed down the gorge and then re-entered the mountain and joined the Whiterock/Clearwater System to resurge for the second time at Clearwater Cave entrance.

### **Frog Cave and Resurgence Prospecting, 21<sup>st</sup> October**

Investigated by Dave Nixon, **Pete Hall** & Helen Fairclough

Following the retreat from the Alcove Climb an attempt was made to find entrances to the streamway associated with the resurgence near Frog Cave. Further work in Frog Cave did not reveal any new passages, however, a 'chink of light' which was seen in 2003 was proven to be an entrance which provides flood-proof access to the cave. Following lunch another hour was spent searching the slopes above the resurgence but this only revealed streams rumbling beneath the surface.

## MEDICAL REPORT

Rostam Namaghi

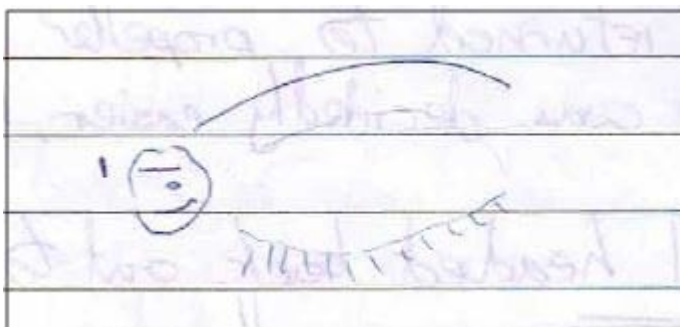
As the qualified doctor on the expedition I was appointed as the medical officer and saw to an inventory at park headquarters, using Dr Henry's medical kits with some additions of my own that were to prove dramatically useful. I also took a medical history of all participants and put together a drug list to take out.

In traditional fashion the medical officer was the most injury prone team member on the trip. A fall (potentially rebreaking the rib) caused significant amounts of pain and substantial opiate analgesia had to be administered throughout the trip to stay functional. Aside from learning that we should have taken more analgesia with us it should be noted that it is an almost insane idea to allow anyone with a potentially broken rib to swim out of a river cave. When I returned home I had my chest X-ray'd and was told that I had broken my rib 4-6 weeks earlier.

Aside from impaling my head on a stalactite and obtaining a core biopsy of my scalp (the other team members on the trip found out how much a scalp can bleed) there were no other injuries to the UK members of the team that required the involvement of the medical officer. There was however an incident at Camp 5 whereby a porter had been bitten on the eyelid by an insect, and after 4 days had a red hot swollen eye, discharging pus. I explained, through a translator, that this could be a life threatening condition and that he needed to see a specialist and get IV antibiotics immediately. The time it would have taken to get to an appropriate surgeon would have been unacceptable as the nearest non 'dental only' Maxillofacial unit was on mainland Malaysia or Singapore.



*Position of injury*



*Detail*

The decision was made to wash out the eye and debride the wound. Fortunately I had taken out a minor ops pack. The 1:80,000 Lidocaine Adrenaline syringes had the rubber cork removed and poured onto the eye to administer sufficient local to the eyeball. Then a protective implement was sought (a teaspoon), sterilised (in 2% iodine), and placed under the lid for adequate manipulation. The lid and eye were washed out with the iodine solution and saline. A scalpel was used to debride the wound, cutting off sloughy tissue and an incision was made to drain an extraorbital abscess. The

tarsal plate was found to have been split and a fine suture repair of the multiple layers was carried out. The result was functional and cosmetic. Flucloxacillin was prescribed.

Advice was given through a translator but both the severity of the procedure and the condition appeared to be lost on the patient. Once the tarsal plate is breached the infection is intraocular and only has periorbital fat between it and the meninges of the brain. I discussed it with my senior colleagues upon return to Swansea Maxillofacial Department and the team was split on the decision to operate. The story has a happy ending as upon a chance meeting I reviewed the wound and eye and was tremendously relieved to find a full recovery.

To any young doctor or future medic of an expedition, please don't be inspired by this story nor think me incredibly gung-ho. I had the fortune of dealing with a similar case in theatre the week before, not to mention a decent surgical log under my belt. As far as what we can learn from the case, these were the recommendations I recorded at the time:

- surgical preparation was as good as it could be
- that we should have taken more syringes from HQ
- dental needles and syringes are the way forward for any administration of local anaesthetic in the jungle
- snapping the scalpel in order to get it into the sharps tupperware wasn't ideal
- the stock of gloves had melted so had to use inadequate protection, they were also too small

Upon further reflection I thought that an expedition medical logbook should have been used rather than a combination of my own notes and the general expedition logbook. I now always take a minor ops set with me and have used it in anger in the field 3 times in the space of a year. Suturing is a dying art amongst medical juniors but evidently is worth it for cases in the field.



## EXPEDITION MEMBERS

### From the UK

Mark Brown (expedition leader; Whiterock))  
Dave Nixon (expedition leader; gorge climb)  
Colin Boothroyd  
Pete Hall  
Helen Fairclough  
Rostam Namaghi  
Jethro Pryke  
Tom Smith

### From Sarawak

Veno Enar, (logistical support)  
Manit Ipoi (Camp 5 cook)  
Steve Lian (cook)  
Jimmy (boatman)



**The October 2017 Team**

#### **Back Row**

Mark Brown (expedition leader), Rostam Namaghi

#### **Front Row**

Dave Nixon (co leader), Colin Boothroyd, Manit Ipoi, Steve Lian, Norton Ting, Jethro Pryke, Tom Smith, Pete Hall,  
Helen Fairclough

## ACKNOWLEDGEMENTS

Members of the Mulu Caves 2017 October expedition are grateful for the support of the following.

### In Sarawak

The Chief Minister of Sarawak  
The Sarawak Secretary of State  
The Director of Forests, Sarawak  
Protected Areas & Biodiversity Conservation Unit, Sarawak Forestry Corporation  
The Sarawak Ministry of Planning and Resource Management  
The Resident, Miri Division  
The Sarawak Immigration Department  
The Sarawak Police Department  
Gunung Mulu National Park Management & Staff  
Hein & Andia Gerstner

### In the UK

Spanset Ltd for supply of ropes

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## APPENDICES



*Jethro Pryke surrounded by horn shaped helictites in Ruse of the Valkyries*      *Photo: Helen Fairclough*





| Discoveries Log Mulu Caves October 2017    |                       |                |                  |                |               |
|--------------------------------------------|-----------------------|----------------|------------------|----------------|---------------|
| date                                       | survex file           | Cave           | survey length    | vertical range | running total |
| 19.10.17                                   | phreas_a_bird         | Whiterock Cave | 1124.15          | 172.54         | 1124.15       |
| 20.10.17                                   | youth_of_today        | Whiterock Cave | 95.55            | 23.60          | 1219.70       |
| 22.10.17                                   | uncharted_engineers   | Whiterock Cave | 219.74           | 77.29          | 1439.44       |
| 23.10.17                                   | overture              | Whiterock Cave | 216.58           | 56.21          | 1656.02       |
| 23-24.10.17                                | stairway_to_heathen   | Whiterock Cave | 427.76           | 83.20          | 2083.78       |
| 23-24.10.18                                | roaring_crawl         | Whiterock Cave | 65.79            | 24.05          | 2149.57       |
| 24.10.17                                   | ruse_of_the_valkyries | Whiterock Cave | 69.21            | 33.68          | 2218.78       |
| 24.10.17                                   | tons_pitch            | Whiterock Cave | 110.36           | 48.12          | 2329.14       |
| 24.10.17                                   | unexpected_view       | Whiterock Cave | 63.42            | 13.98          | 2392.56       |
| 27.10.17                                   | gone_in_60_meters     | Whiterock Cave | 84.58            | 52.50          | 2477.14       |
| 28.10.17                                   | overlook              | Whiterock Cave | 485.82           | 51.58          | 2962.96       |
| 28.10.17                                   | 101                   | Whiterock Cave | 469.29           | 54.37          | 3432.25       |
| 29.10.17                                   | redemption            | Whiterock Cave | 805.22           | 41.30          | 4237.47       |
| <b>Expedition total</b>                    |                       |                | <b>4237.47</b>   |                |               |
|                                            |                       |                |                  |                |               |
| Whiterock After 2015                       |                       |                | 96433.80         |                |               |
| <b>Whiterock Total</b>                     |                       |                | <b>100671.27</b> |                |               |
| Clearwater System after Easter '17         |                       |                | 222657.90        |                |               |
| <b>Clearwater Total after October 2017</b> |                       |                | <b>226895.37</b> |                |               |
|                                            |                       |                |                  |                |               |

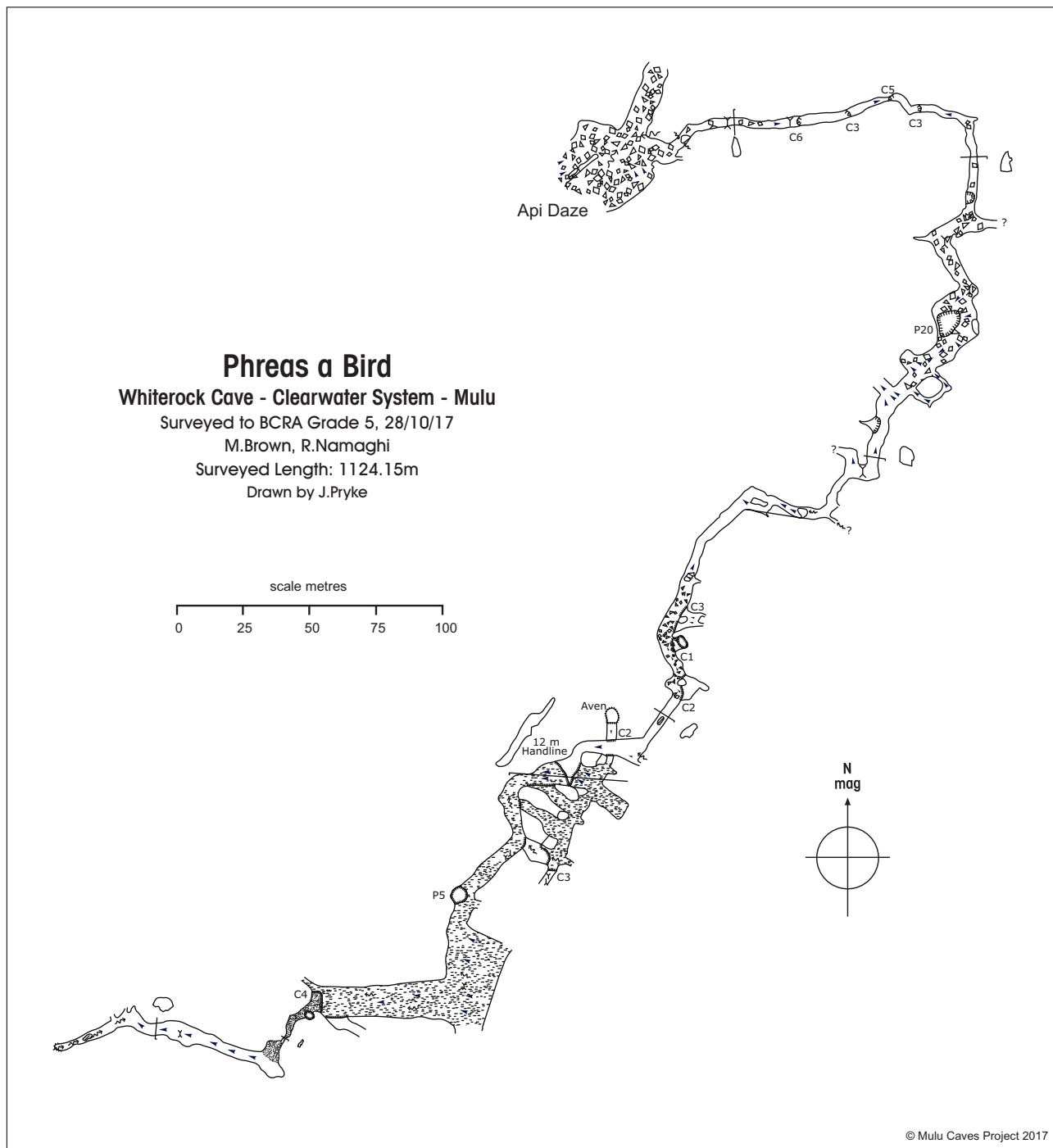


## Appendix 2:

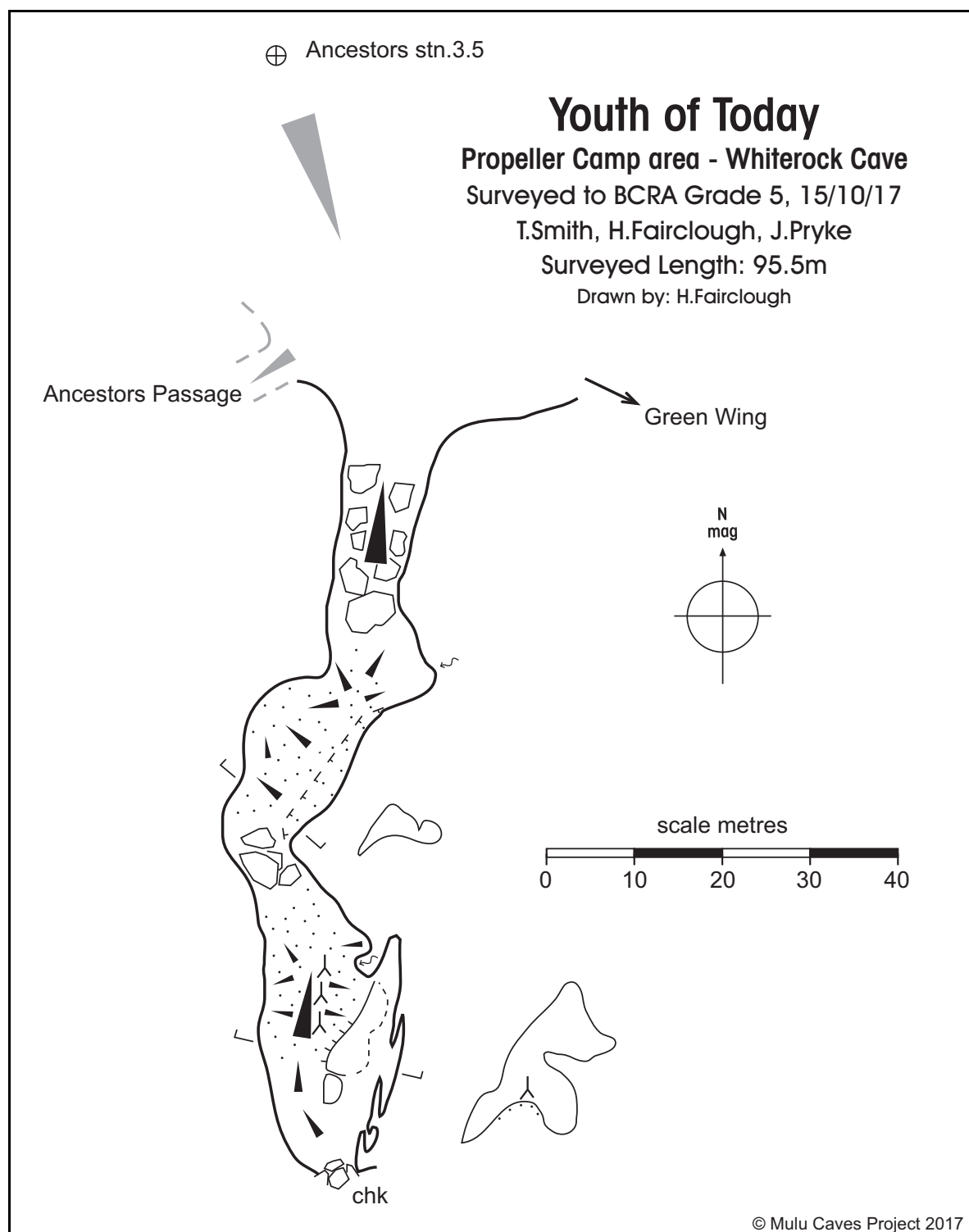
## Financial Breakdown

| Date        | Item                                                   | Unit cost | No. | Total RM        | Total sterling  | Comments                                 |
|-------------|--------------------------------------------------------|-----------|-----|-----------------|-----------------|------------------------------------------|
|             | Veno fees (per day with us)                            | 200       | 20  | 4000            | 800             |                                          |
|             | 2 day bonus Veno                                       |           |     | 400             | 80              |                                          |
|             | Mateo Mani chef fees                                   | 150       | 22  | 3300            | 660             |                                          |
|             | Steve Jackson guide/porter fees                        | 150       | 9   | 1350            | 270             | (plus two days portering included below) |
|             | Norton Stanley assistant                               | 120       | 9   | 1080            | 216             | (plus two days portering included below) |
|             | Veno Air ticket return                                 | 181.65    | 2   | 363.3           | 72.66           |                                          |
|             | Matteo air ticket return                               | 181.65    | 2   | 363.3           | 72.66           |                                          |
| 10.11.17    | Air cargo 18pieces 225kg (1Rm kg) plus tax             | 327.71    | 1   | 327.71          | 65.542          |                                          |
| 10-11.10.17 | Airport and cargo transfers HQ                         | 80        |     | 80              | 16              |                                          |
|             |                                                        |           |     |                 |                 |                                          |
| 8.10.17     | food miri                                              | 87.45     | 1   | 87.45           | 17.49           |                                          |
| 9.10.17     | supermarket shop                                       | 1846.24   | 1   | 1846.24         | 369.248         |                                          |
| 9.10.17     | other supermarket                                      | 494.25    | 1   | 494.25          | 98.85           |                                          |
| 9.10.17     | tupperwares string etc                                 | 145.8     | 1   | 145.8           | 29.16           |                                          |
| 9.10.17     | milk powder etc.                                       | 53.1      | 1   | 53.1            | 10.62           |                                          |
| 9.10.17     | bin bags etc                                           | 82.8      | 1   | 82.8            | 16.56           |                                          |
| 9.10.17     | nuts and raisins,                                      | 299.2     | 1   | 299.2           | 59.84           |                                          |
| 9.10.17     | Trench tool hardware boxes                             | 136.9     | 1   | 136.9           | 27.38           |                                          |
| 9.10.17     | food miri                                              | 187.5     | 1   | 187.5           | 37.5            |                                          |
| 10.10.17    | meat                                                   | 86.95     | 1   | 86.95           | 17.39           |                                          |
| 10.10.17    | food                                                   | 17.95     | 1   | 17.95           | 3.59            |                                          |
| 10.10.17    | Mulu park wifi                                         | 15        | 1   | 15              | 3               |                                          |
| 10.10.17    | eggs and meat                                          | 153       | 1   | 153             | 30.6            |                                          |
| 10.10.17    | Fruit cake                                             | 400       | 1   | 400             | 80              |                                          |
| 10.10.17    | Beer                                                   |           | 1   | 0               | 0               |                                          |
| 10.10.17    | Assistant and transport for shopping, sending cargo    | 150       | 1   | 150             | 30              |                                          |
| 10.10.17    | Hand sanitiser                                         | 47.7      | 1   | 47.7            | 9.54            |                                          |
| 11.10.17    | Petrol for generator                                   | 75        | 1   | 75              | 15              |                                          |
| 12.10.17    | meat and veg for c5                                    | 858.2     | 1   | 858.2           | 171.64          |                                          |
| 12.10.17    | Camp 5 food                                            | 164       | 1   | 164             | 32.8            |                                          |
| 12.10.17    | milk powder and choc                                   | 181       | 1   | 181             | 36.2            |                                          |
| 20.10.17    | meat                                                   | 71.75     | 1   | 71.75           | 14.35           |                                          |
| 20.10.17    | veg                                                    | 36.2      | 1   | 36.2            | 7.24            |                                          |
| 27.10.17    | food                                                   | 47.95     | 1   | 47.95           | 9.59            |                                          |
| 9.10.17     | Malaysia SIM plus credit                               | 60        | 1   | 60              | 12              |                                          |
|             |                                                        |           |     |                 |                 |                                          |
| 8/9.10.17   | Classy Inn (mark Helen Rostam)                         | 130       | 2   | 260             | 52              |                                          |
| 9.10.17     | Classy Inn Tom, Jethro                                 | 65        | 1   | 65              | 13              |                                          |
|             |                                                        |           |     |                 |                 |                                          |
| 11.10.17    | porters to C5 (food)                                   | 120       | 5   | 600             | 120             |                                          |
| 11.10.17    | Boat                                                   | 250       | 1   | 250             | 50              |                                          |
|             |                                                        |           |     |                 |                 |                                          |
| 12.10.17    | Porters to C5 food and gear                            | 120       | 20  | 2400            | 480             |                                          |
| 12.10.17    | boats for porters and people                           | 250       | 4   | 1000            | 200             |                                          |
|             |                                                        |           |     |                 |                 |                                          |
| 13.10.17    | Porters to C5                                          | 120       | 6   | 720             | 144             |                                          |
| 13.10.17    | boat                                                   | 250       | 1   | 250             | 50              |                                          |
|             |                                                        |           |     |                 |                 |                                          |
| 17.10.17    | porters resupply                                       | 120       | 2   | 240             | 48              |                                          |
| 17.10.17    | boat                                                   | 250       | 1   | 250             | 50              |                                          |
|             |                                                        |           |     |                 |                 |                                          |
| 21.10.17    | porters resupply (plus Moose and Pete walk out)        | 120       | 4   | 480             | 96              |                                          |
| 21.10.17    | Boat                                                   | 250       | 1   | 250             | 50              |                                          |
|             |                                                        |           |     |                 |                 |                                          |
| 31.10.17    | porters out                                            | 120       | 9   | 1080            | 216             |                                          |
| 31.10.17    | boats out                                              | 250       | 4   | 1000            | 200             |                                          |
|             |                                                        |           |     |                 |                 |                                          |
|             | Research centre and C5 accom (155 person nights @10RM) | 10        | 155 | 1550            | 310             |                                          |
|             | Mulu cafe meals at HQ Oct                              | 1353.1    | 1   | 1353.1          | 270.62          |                                          |
|             | Mulu cafe meals Nov                                    | 485       | 1   | 485             | 97              |                                          |
|             |                                                        |           |     |                 |                 |                                          |
|             | <b>Total</b>                                           |           |     | <b>29195.35</b> | <b>5839.07</b>  |                                          |
|             |                                                        |           |     |                 |                 |                                          |
|             | <b>Per person costs</b>                                |           |     | <b>Rm</b>       | <b>Sterling</b> |                                          |
|             | Total divided by 123 mandays at C5 = Day rate          |           |     | 237.36          | 47.47           |                                          |

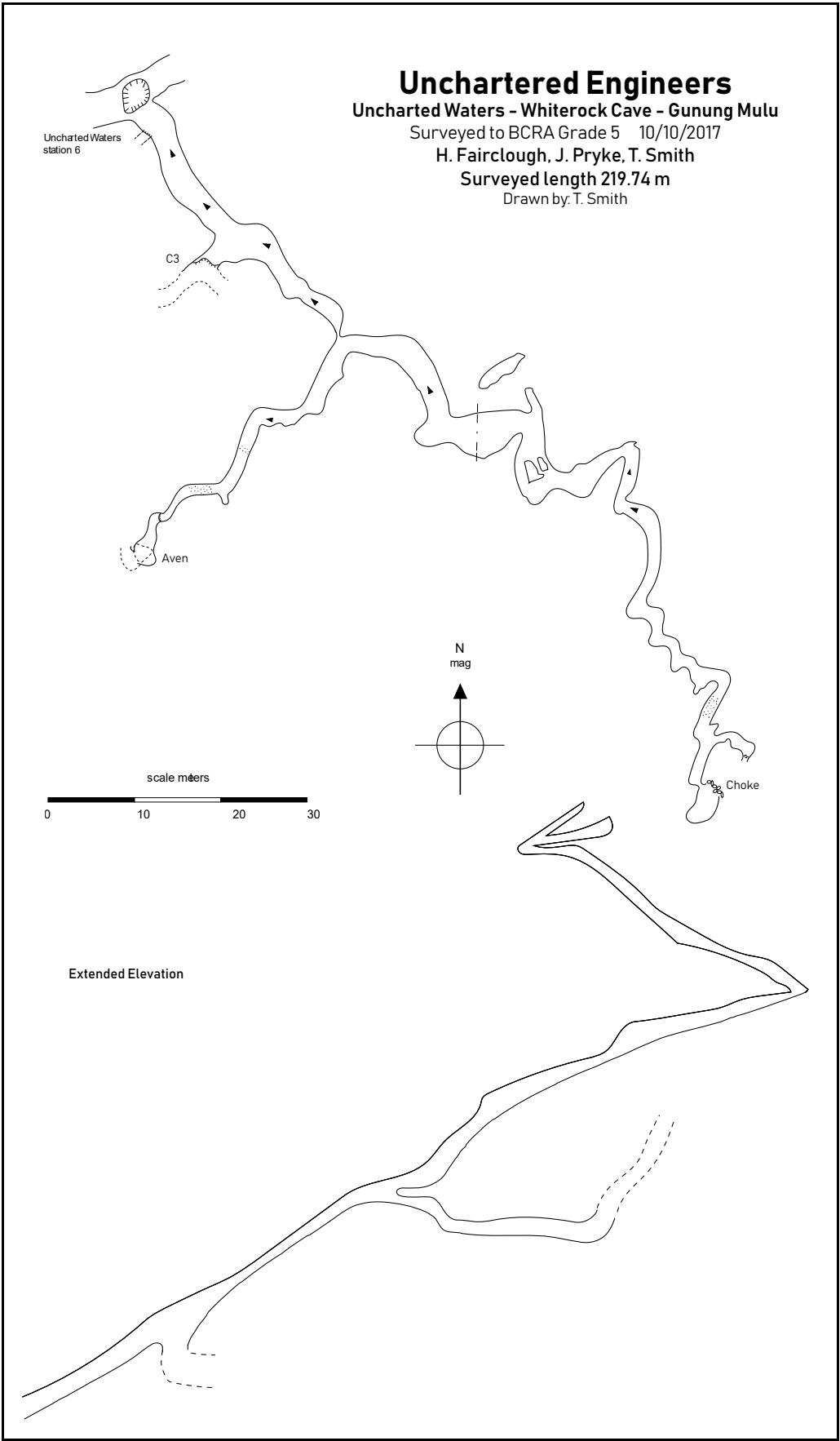
## Phreas a Bird



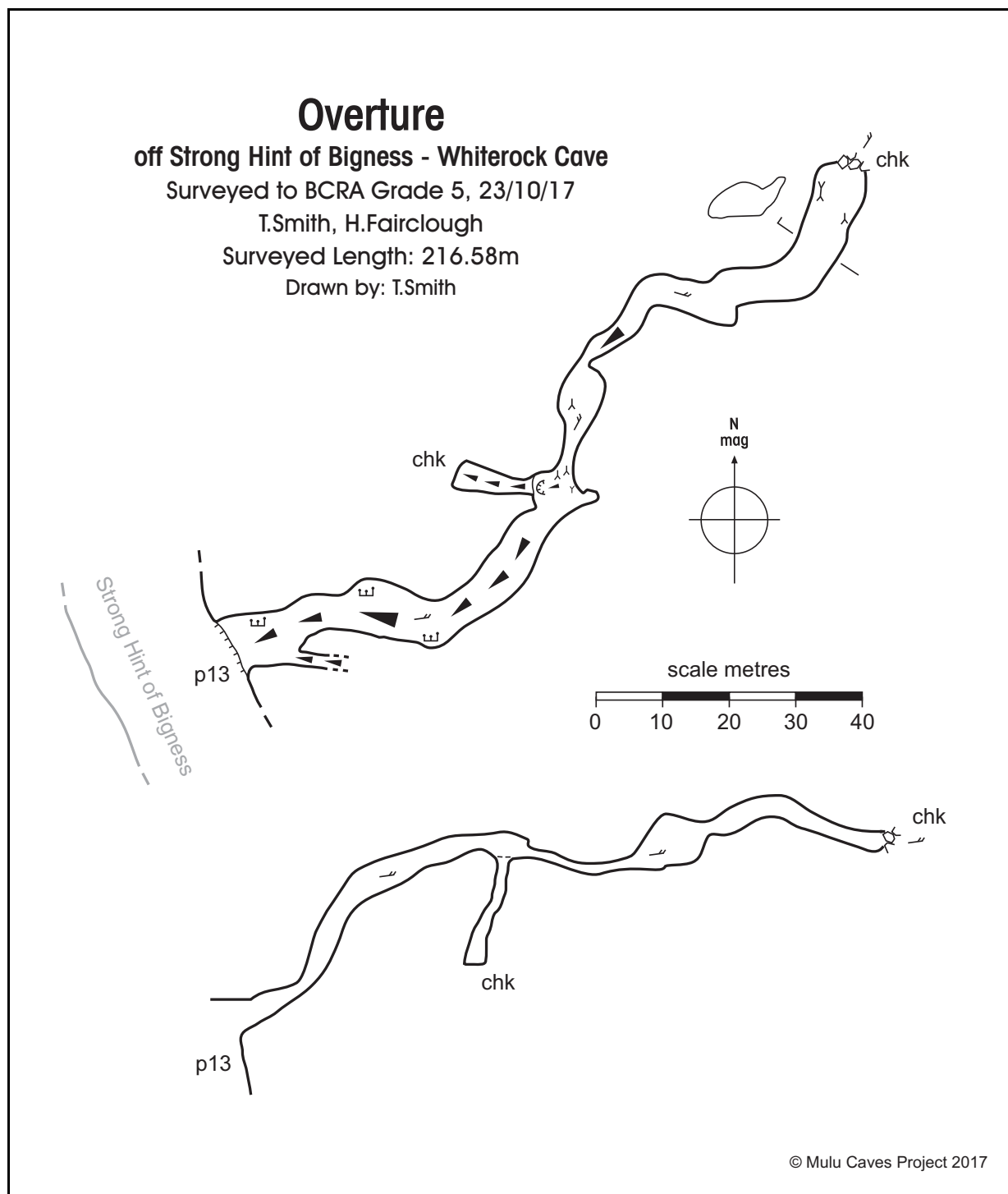
## Youth of Today



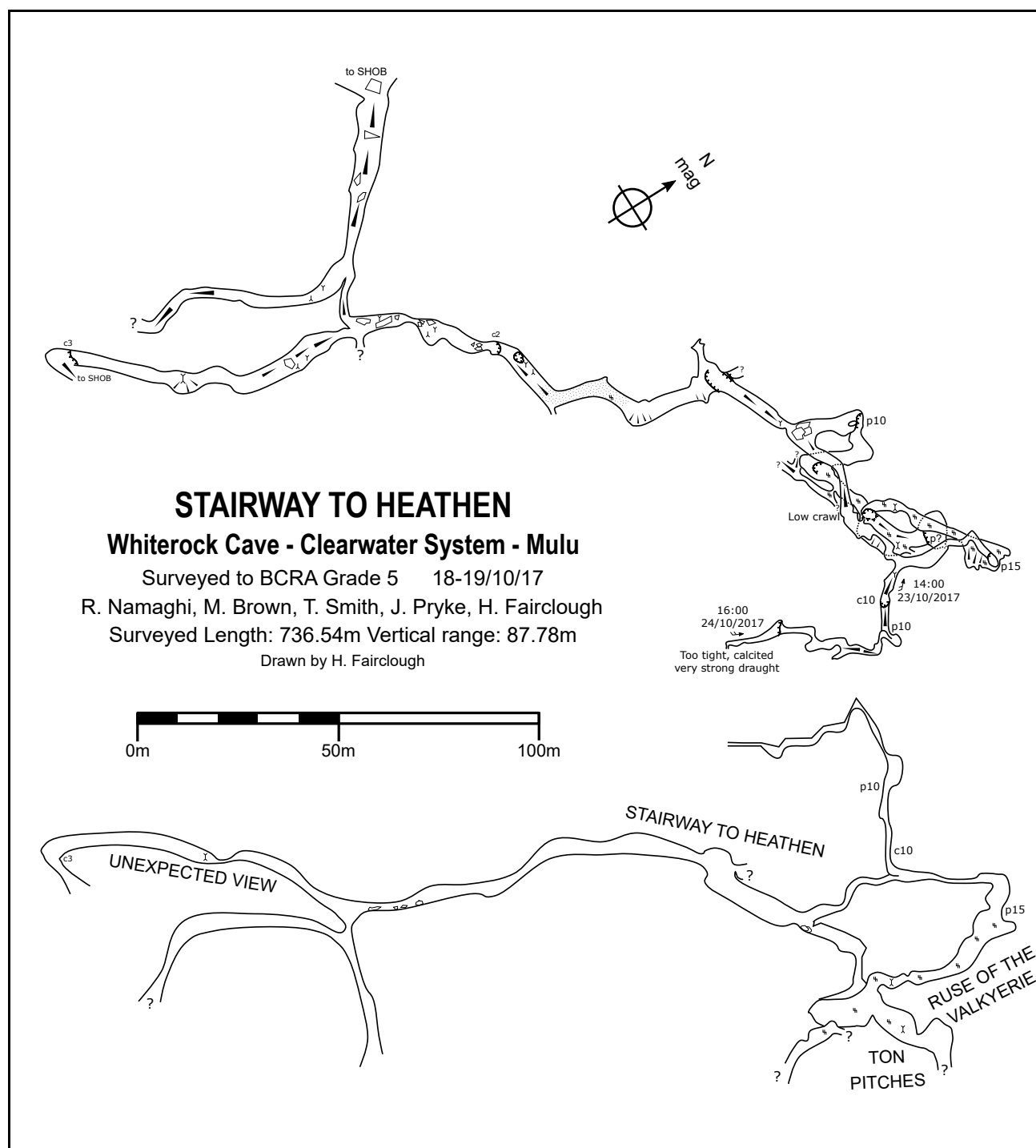




## Overture

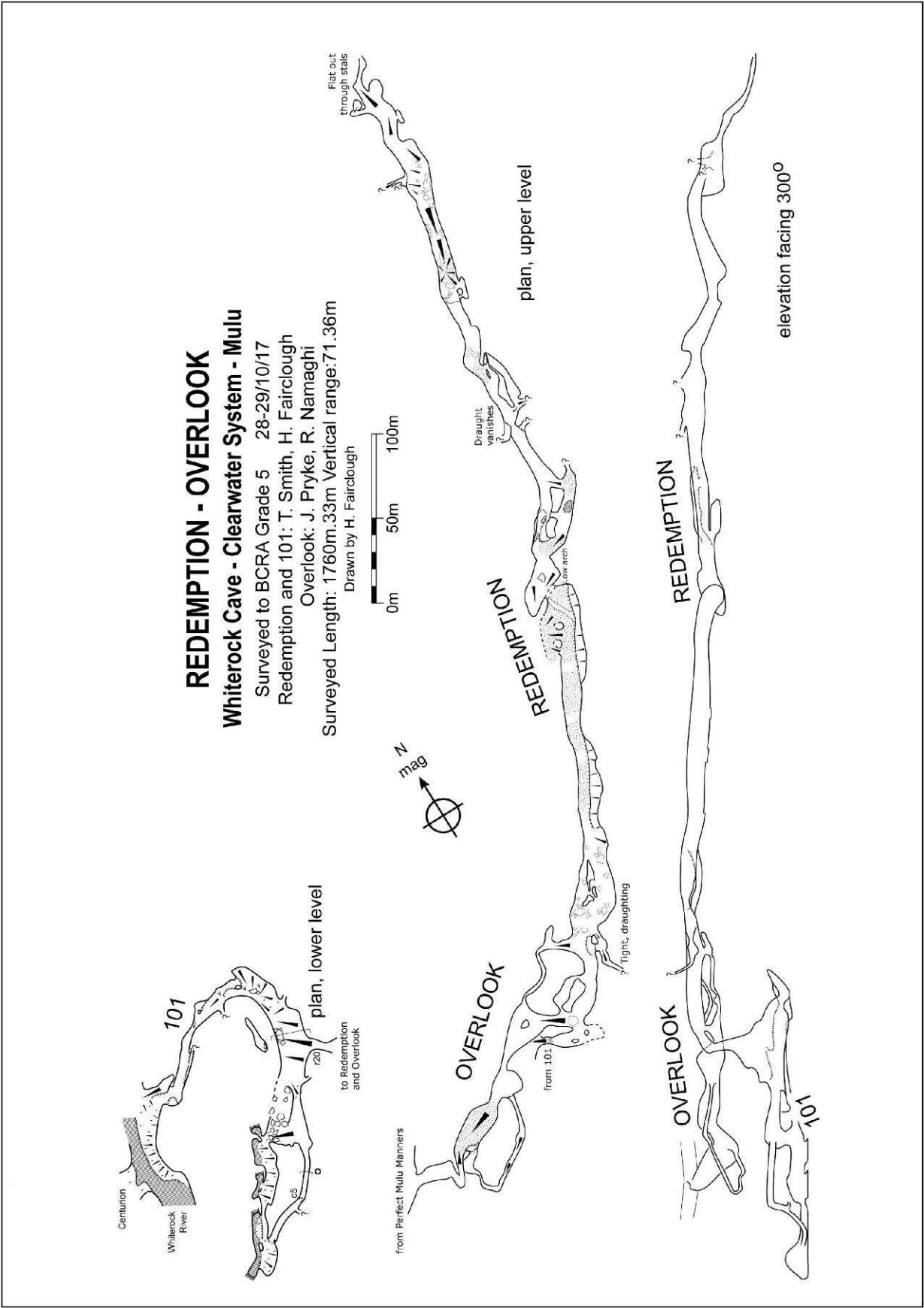


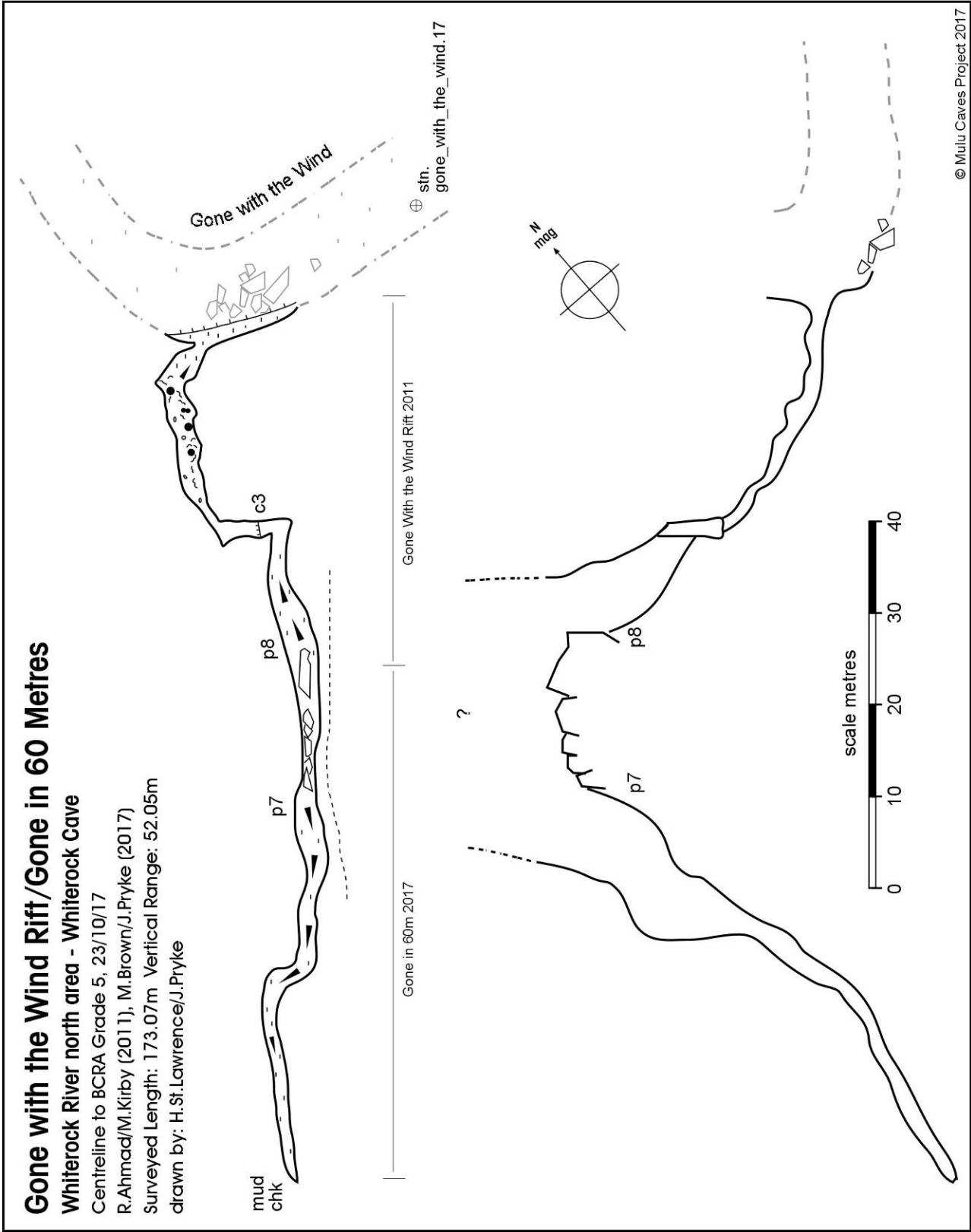
## Stairway to Heathen, Roaring Crawl, Tons Pitch, Unexpected View & Ruse of the Valkyrie





101, Redemption & Overlook combined





*The Pointless Junction area of Whiterock is a very remote place. It takes two days hard caving to reach but it lies within 300m of Camp 5 and 79m below it. Because of this it is a seldom visited part of the cave. But it holds potential for further discoveries and possibly a way out into the Melinau Gorge. During this expedition Mark Brown and Jethro Pryke visited the area for the first time; the following are Mark's recollections of the trip.*

The trip from Propeller Camp to the far North of Whiterock is a spectacular and varied caving outing, where we benefitted enormously from Hugh's route guides. From Propeller Camp some scrambling up and down led to the big passage of Green Wing which leads via a brief glimpse of the Northern Line into the flat, wide, easy-walking of Lemon Squeezy. This breaks out into the ominous darkness of the Northern Line, where a crafty escape can be made up a ramp back into some wriggling around calcite in Harley Delightful and the powdery rift of Upwind. These soon pop out into the majestic, high and wide 1954 passage. The well appointed Flying Monkey camp can be found here, tucked in behind a huge cockscomb pinnacle of rock, with its "presidential suite" on the top terrace. More fine walking passage leads to the drop-in point of Downhill Racer series and Ski Wednesday. Here the character changes into descending gypsum-encrusted tubes where it feels like you should be on skis. Large gypsum needle snowballs (cave cotton) can be seen and a unique "corkscrew" gypsum straw.

The base of the ramps leads to some crawling and stooping hading rifts with some slippery handline climbs up and down Snowboard Tuesday before the sand banks of the Whiterock River are met. A long plod upstream through the gently flowing river, over an area of boulder breakdown and back into sand banks leads past Swiftwater Inlet on the left to Pointless Junction. Here there is a high and wide aven overhead that could be worthy of further investigation. To the north the passages become a lot more fragmented into rifts and boulder chokes, presumably due to the location under the Melinau gorge.

Up a steep boulder slope to the south and back down leads into Gone with the Wind passage. This is a pleasant, dry, mud-floored passage with a mega draught and its spectacular long, lone straw and the famous "stepped" wind-blown stals. Gone With The Wind heads back south and eventually rejoins the main active river passage.

Without investigating any leads this is approximately a 12 hour round trip from Propeller Camp.





# the **MULU** Caves Project

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Front cover: Dave Nixon reaches 'The Alcove' on the Melinau Gorge cliff - photo Pete Hall  
Rear cover: Cave cricket at the Whiterock entrance - photo Tom Smith  
Cover design by Hugh St.Lawrence