BULLETIN of the

Sydney University Speleological Society

Lumen in Tenebris

SUSS

FOUNDED 1948

SUSS Bulletin 32 (4)

December, 1992

Registered by Australian Post — Publication No. NBH 0712 — Category B.

Box 35, Holme Building, University of Sydney, N.S.W. 2006

The other caves at Tuglow

Martin Scott & Ian Cooper

Introduction

If you look at the Karst Index, the official list of all known caves in Australia, you'll find that the Tuglow karst has only one cave, the main Tuglow Cave (Pavey 1974). However, if you look through the speleological literature you'll find there are plenty of other caves at Tuglow. For example, the Index to Cave Maps in NSW (Pavey 1972a) shows that Andrew Pavey had surveyed 6 other caves at Tuglow by 1972. It is quite clear that Andrew Pavey has restricted information on Tuglow, an area he spent some 20 years investigating. This is particularly disappointing, as he presumably has a lot of valuable information and cave maps, which would be useful for management, research and recreational caving.

It was this lack of information on the area and Tuglow Cave that started the SUSS investigation of Tuglow 5 years ago. In this time we have learnt a lot about Tuglow, and learnt that there is an awful lot of work required in compiling information and surveys up to a suitable standard for book publication. This paper aims to tell you as much of what we have learnt about the other caves at Tuglow. Included is a list of the caves at Tuglow plus their maps and descriptions. Surveying and map drawing is still in progress for Tuglow Cave (T1).

A permit system is used by Oberon N.P.W.S. to limit access to Tuglow Caves to only one caving group at any one time. A number of the caves are located on private property. The landowners insist that cavers do not trespass or go caving on the property without their consent. Please make sure you comply with their wishes.

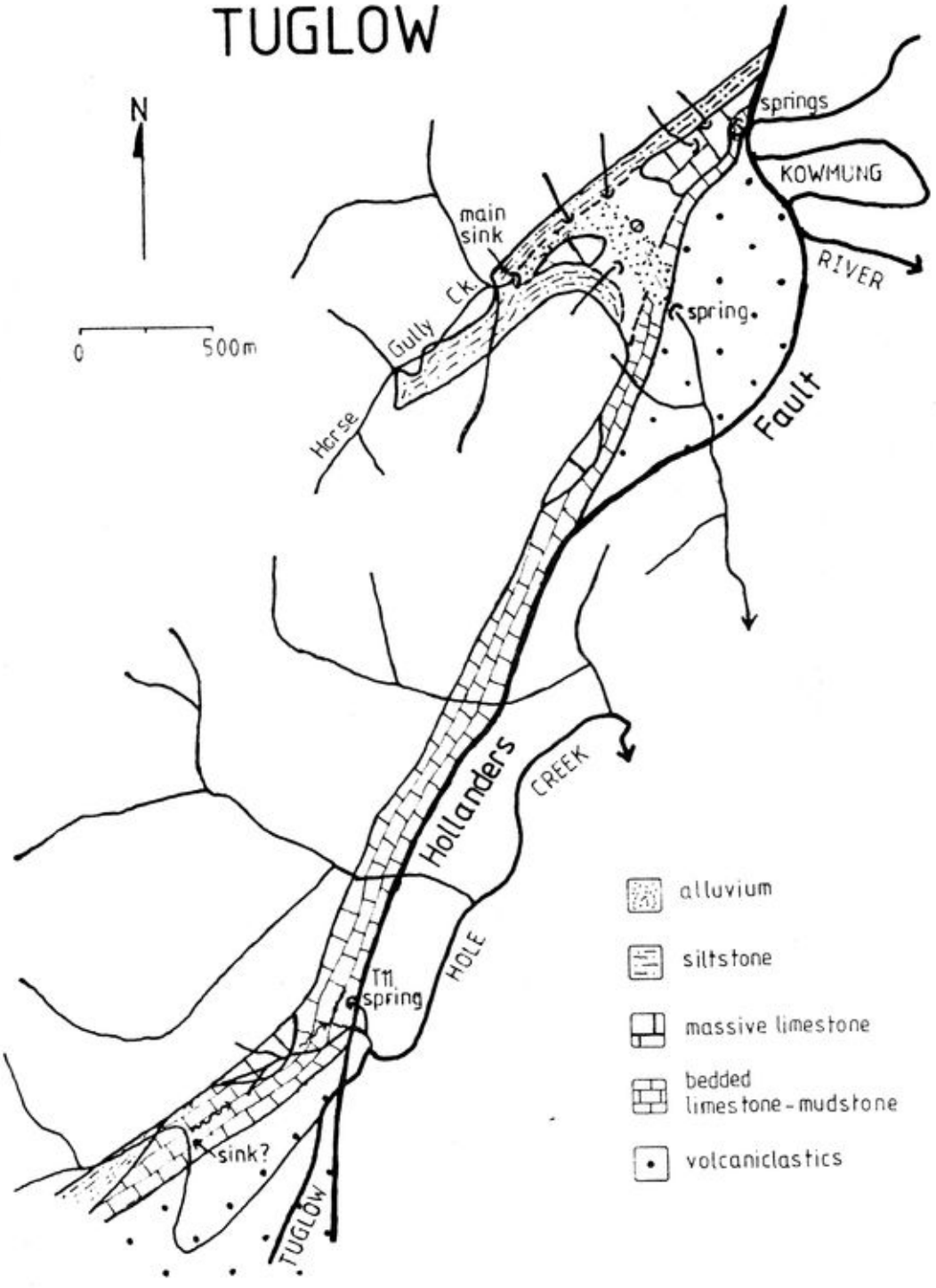
The Tuglow Karst

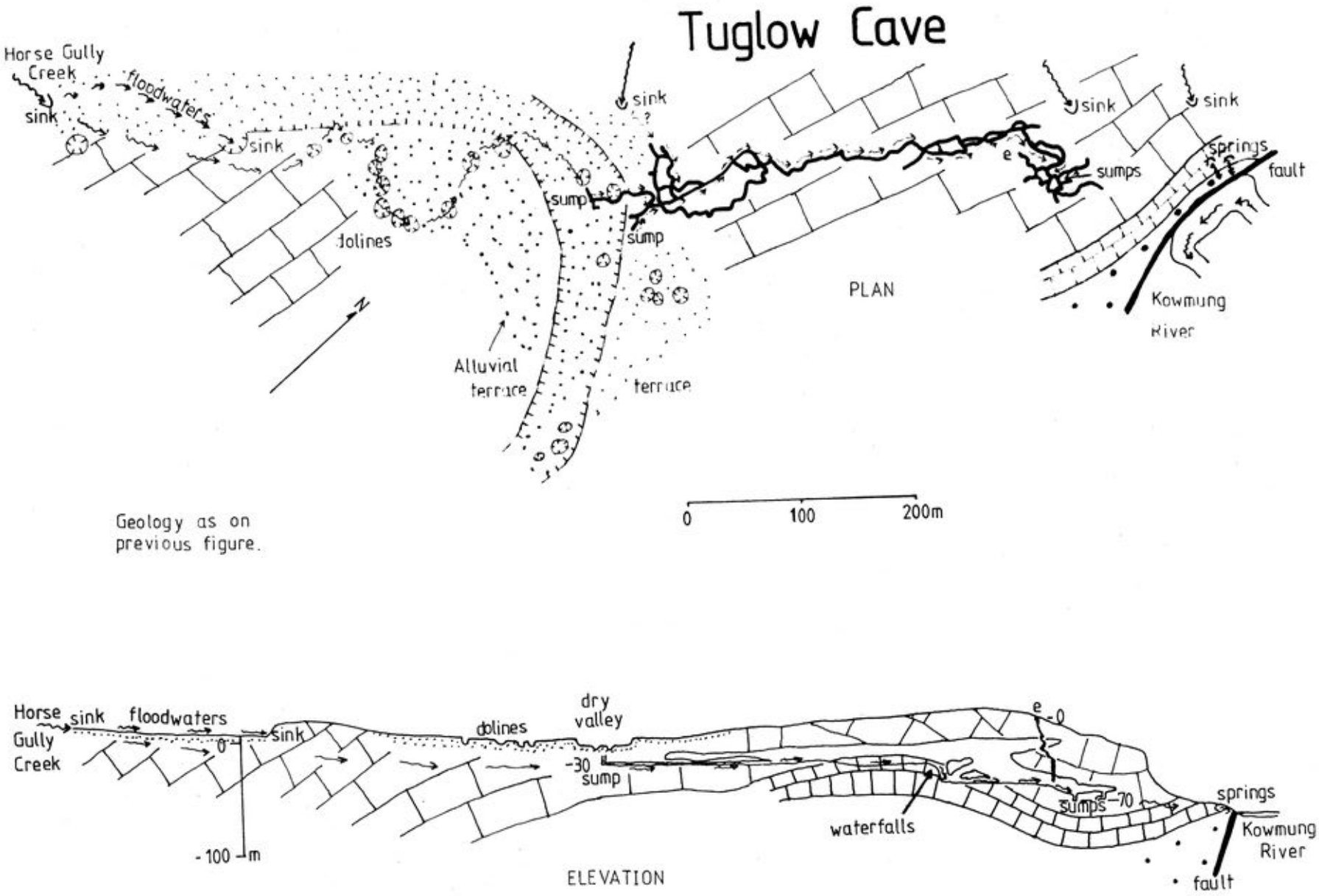
The Tuglow karst is located 30km SSE of Oberon, in limestone drained by the Kowmung River, Horse Gully Creek, Tuglow Hole Creek and their tributaries, west of 149° 57'E and north of 34°00'S [redefined from Pavey (1974)]. The altitude of the karst is between 890-1010m ASL.

The karst is formed in a Late Silurian limestone formation outcropping on the faulted eastern limb of the Tuglow Synclinorium (Scott 1991). The limestone formation consists of a basal bedded limestone-mudstone member which outcrops at the waterfalls in Tuglow Cave and at the Tuglow resurgence caves. Most of the caves are formed in the overlying massive limestone member. The uppermost unit is a siltstone member. The limestone formation is underlain by a volcaniclastic sequence which has controlled the downcutting of the underground drainage and the level of karst springs. Overlying the limestone sequence are Devonian silicic volcanics, dolerite dykes, quartzose sandstones and siltstones which outcrop in the catchment area of the karst. Boulders of weathering-resistant dolerite are most noticeable upstream in Tuglow Cave. Numerous dykes intrude the limestone and outcrop well in cave walls.

The karst consists of two main drainage systems (Fig. 1). Water from Horse Gully Creek is captured by the Kowmung River and flows NE underground through Tuglow Cave (Fig. 2). Horse Gully Creek in the north sinks in alluvium immediately upstream of outcropping massive limestone. The creek presumably flows underground beneath numerous dolines formed in limestone and alluvium before emerging at the upstream sump in Tuglow Cave. The creek can be followed for 400m between the upstream and downstream sumps in Tuglow Cave. The creek resurges in springs 100m north of the Tuglow downstream sump. Numerous small surface tributaries also sink upon reaching the limestone and contribute water to the underground Horse Gully Creek. Water seeps to the surface downstream in Horse Gully Creek (Fig. 1), possibly suggesting that Tuglow Cave does not capture all the drainage from the limestone at Horse Gully Sinks.

The Tuglow Hole Spring discharges water from the faulted margin of limestone beside Tuglow Hole Creek in the south (Fig. 1). The water is presumably derived from a tributary of Tuglow Hole Creek partially sinking at limestone outcrops 800m SW of the spring. Underground drainage has not developed elsewhere in the karst because the limestone is predominantly thinly-interbedded with mudstone and the outcrops of massive limestone only receive limited surface drainage.


TUGLOW
N
0
500m
springs
KOWMUNG
RIVER
main sink
Ck.
Gully
spring
Horse
Fault
Hollanders
CREEK
HOLE
Tm spring
sink?
TUGLOW
alluvium
siltstone
massive limestone
bedded limestone - mudstone
volcaniclastics


Tuglow Cave
Horse Gully Creek
sink
floodwaters
sink
sink
sump
sump
dolines
N
Alluvial terrace
terrace
sink
sink
sumps
springs
fault
PLAN
Kowmung River
0
100
200m
Geology as on previous figure.
Horse Gully Creek
sink
floodwaters
sink
dolines
dry valley
0
-30
sump
-100 m
waterfalls
sumps -70
springs
Kowmung River
fault
ELEVATION

The Caves at Tuglow

T1	Tuglow Cave
T2/24	Window Cave (lower and upper entrances)
T3	Pleistocene Cave
T4	Moonmilk Cave
T5	Unnamed tight rift
T6/7/8	Wombat Cave
T9	Waterfall Cave
T10	Pushhi Cave
T11	Tuglow Hole Spring
T12-19	Numbers not as yet allocated
T20	Horse Gully Cave
T21	Temple Of Wom
T22	Unnamed small cave/dig in a Horse Gully Sink doline
T23	Unnamed small cave that was a resurgence to Window Cave
T25	A Tuglow resurgence cave

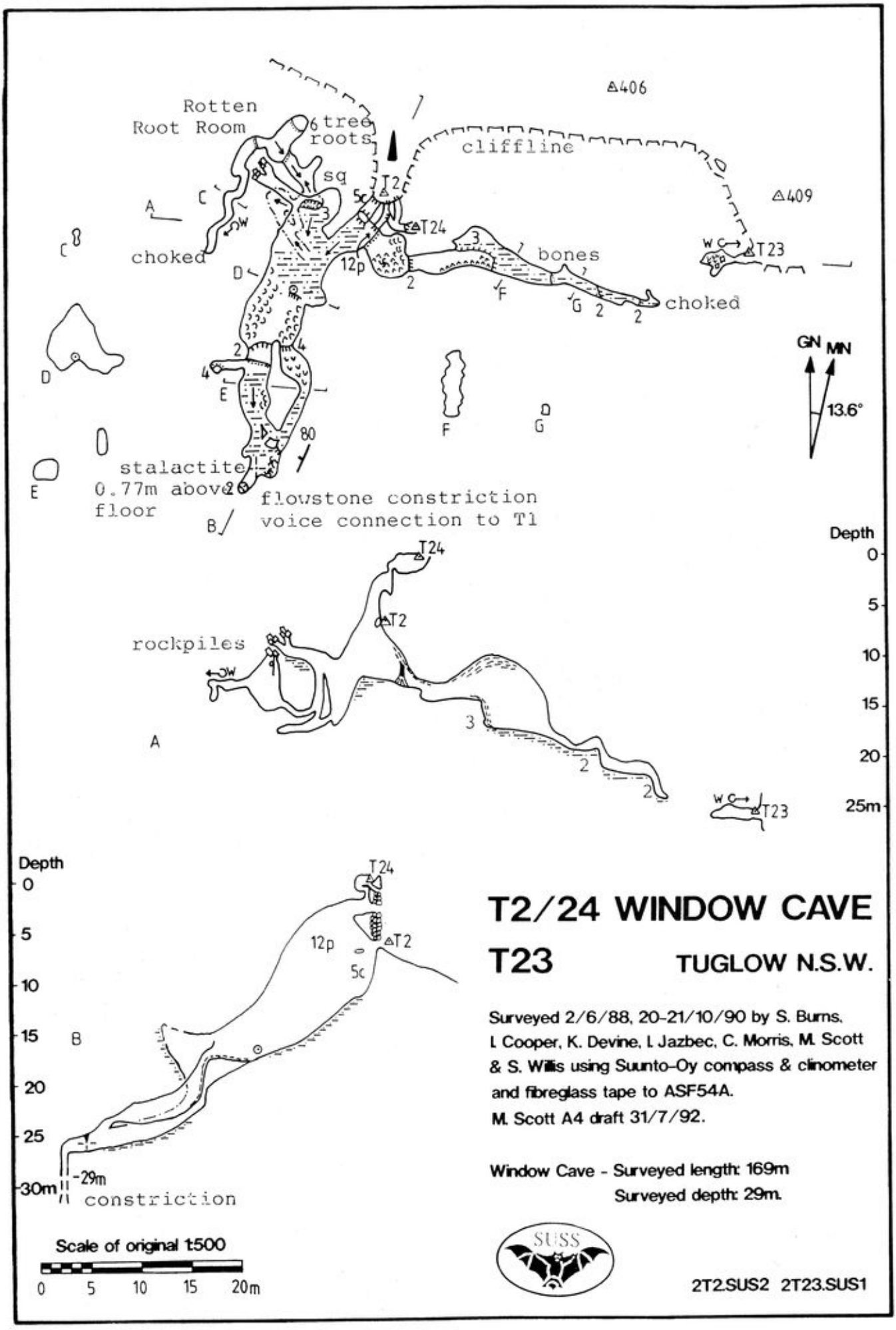
T2/24 Window Cave Length: 169m Depth: 29m

Window Cave has two tagged entrances and there are a few others in gravel deposits on the cliff face. The lower entrance is tagged T2 and upper entrance T24. The cave has been known about since last century, as the map of Trickett(1898) shows the location of a cave matching that of Window Cave. Probably the earliest reference to the cave being visited and named is Moriarty(1935). In 1934, Moriarty's group was unable to descend Tuglow Cave to the streamway, so instead prospected the limestone and found another entrance. Moriarty(1935) describes the entrance as 'a vertical slit in the face of the cliffs..... and has been called "The Window", I believe'. This would suggest the cave had been visited and named by other groups previous to 1934. On this trip they were searching for another entrance and way into Tuglow Cave, and even lowered stones on the end of strings in the hope that they would find them in Tuglow Cave. They did succeed getting down Tuglow Cave on a subsequent trip and probably would have found the connection to Window Cave, except that in all probability the stone landed on a ledge above the Tuglow streamway. This possibility was also quite intuitively suggested by Moriarty(1935).

The lower entrance is just to the right off the track from Tuglow Cave down "Window Valley" to the Kowmung River, and the upper entrance is at the top of the cliff face. Maps of Window Cave have been published by Pavey (1971b) and Scott(1988), and Hills Speleological Society have an unpublished map of the cave (G. Kates *pers. comm.* 1992). The map herein is updated from the one by Scott(1988) and shows the upper entrance and the close relationship of Window Cave to the old resurgence cave T23.

Entry to Window Cave is normally through the lower entrance and down a 5m chimney climb where a tape handline or ladder can be useful for those not too confident with climbing. The alternative is via the upper entrance which leads to a 12m abseil down a narrow rift which bells out into the entrance chamber. By climbing 8m up the left hand wall of the entrance chamber, members of BMSC found a high level passage choked with mud (Nelson 1968). In 1968 BMSC spent 3 hours digging in the passage although it was abandoned as it didn't have much promise.

The entrance chamber has a silt floor which slopes downwards to the southwest. Just past a survey cairn at floor level is old flowstone on the left and right. At this point, the high roofed entrance chamber bifurcates into two smaller south-trending vadose-incised phreatic passages which rejoin lower down. The passage to the left leads to a 4m climb down old flowstone. The passage to the right drops below a 5m+ sediment wall and rejoins the left-hand passage at a small chamber with some nice formations. Just past the formations is a flowstone constriction, through which there is a voice connection with an aven above the main downstream sump in Tuglow Cave.



T2/24 WINDOW CAVE

T23 TUGLOW N.S.W.

Surveyed 2/6/88, 20-21/10/90 by S. Burns, I. Cooper, K. Devine, I. Jazbec, C. Morris, M. Scott & S. Willis using Suunto-Oy compass & clinometer and fibreglass tape to ASF54A.
M. Scott A4 draft 31/7/92.

Window Cave - Surveyed length: 169m
Surveyed depth: 29m.

SUSS

2T2.SUS2 2T23.SUS1

There are a number of passages to the northwest of the entrance chamber. Upslope from the entrance chamber are small passages descending from a rockpile choked roof. There is also a squeeze in the floor and a 3m downclimb which both lead to small passages and an awkward squeeze that opens up into a chamber named Rotten Root Room (Pavey 1971b). A thick tree root descends from a rockpile choked aven. Leading from this chamber is a small vadose-incised phreatic passage with SW-directed scalloping and floor slope. This passage was not shown on the map by Pavey(1971b), although was entered subsequently by UNSWSS (Pattison 1973) and others had visited it before their trip. The rockpile choked rooves of the Rotten Roof Room and upslope of the entrance chamber must be close to the surface.

Heading east from the entrance chamber is a passage initially decorated by flowstone and a column. A 2m climb leads past flowstone to a 3m climb and a 6m high vadose passage with sediment and bones on the floor and formations in the roof. The roof drops and a small passage with a silt floor can be followed down two climbs before choking out. This eastern end of Window Cave is 1m above and 6m SW from the cave T23 (see map).

There are consolidated gravel and conglomerate deposits in the cliff face at the entrances to Window Cave. These deposits indicate Window Cave was a major streamsink for the old Window Valley stream. The stream has eroded a small canyon in the limestone cliff face immediately before the entrances. This stream has also deposited considerable amounts of sediment which are exposed in the walls and floors of Window Cave. The development of the cave shows the changing direction of water flow through the limestone outcrop. New passages have probably formed due to older ones become choked with sediment forcing changes in stream flow, and also been influenced by the downcutting of the stream in Tuglow Cave.

Water probably initially flowed along the east-trending passage in Window Cave and resurged through cave T23. A combination of sediment choking of the east-trending passage and downcutting of the large south-trending passage in Window Cave, led to water being directed south and then probably southeast to the high rift in Pleistocene Cave and out this caves entrances. The large south-trending passage in Window Cave became choked with sediment, as evident by the 5m+ wall. This sediment choking of the passage and downcutting by the Tuglow Cave stream, diverted water down and south along phreatic tubes to Tuglow Cave. The position of the Window Cave stream sink presumably dropped from near the higher entrance to the lower entrance over time. Some of the water sinking has been directed west to a number of avens, including the Rotten Root Room from where water flowed southwest.

T3 Pleistocene Cave Length: 69m Depth: 8m

Pleistocene Cave has two entrances located at the base of the main limestone bluff overlooking the Kowmung River. The higher and more obvious entrance is tagged T3. The cave was first surveyed by UNSWSS in 1970 and a map published by Pavey(1971b). The cave has been known since at least 1959, when UNSWSS undertook a surface survey of the main limestone bluff tying in the location of the cave with Tuglow Cave and Window Cave (Anon 1960). The cave has also been called Plasticine Cave, although the cave is named Pleistocene Cave following Pavey(1971b). The origin of both of these names is unknown.

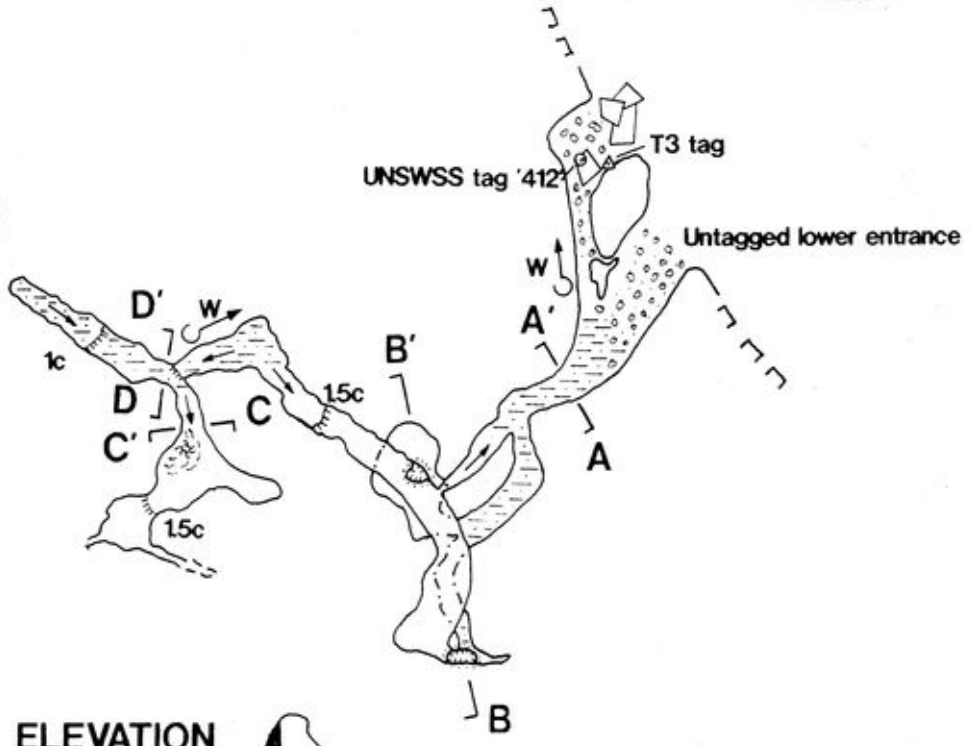
The two entrances lead to a crawl heading SW along an earth-floored passage, from which there a number of passages to a 5m high rift. Initially, an aven becomes impenetrable before joining with the rift. Further SW the earth-floored passage splits into small phreatic tubes heading north and south to 2m climbs up into the rift (section B-B'). The rift continues for 25m as a 4m high vadose passage containing shawls to the western end of the cave. A low crawl at floor level to the west leads past some flowstone and formation to the lowest point in the cave, a calcite decorated pit. Impassable leads continue high to the left, and in the floor. A prominent water level mark in the final chamber indicates previous ponding in this chamber.

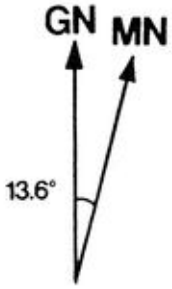
Pleistocene Cave lies SW of Window Cave (T2/24), and the two caves were presumably part of the same old cave system. Scalloping on the cave walls indicates previous flow eastwards through the cave and out the present cave entrances. Later in the cave development, water was redirected downwards into the calcite decorated pit and presumably into Tuglow Cave. Sediment and formations have since choked the pit, causing intermittent ponding in this chamber.

T3 PLEISTOCENE CAVE

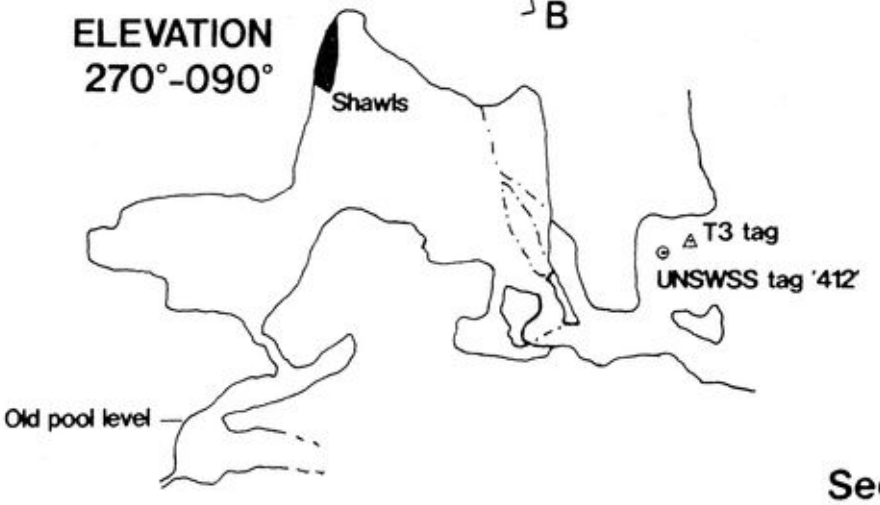
TUGLOW N.S.W.

PLAN





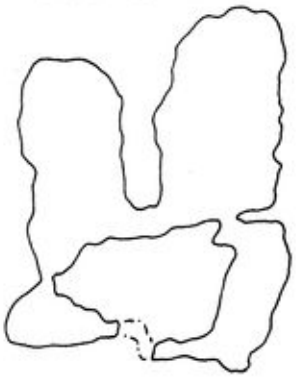
ELEVATION
270°-090°



Section A-A'

Surveyed 20/10/1990 by Ian Cooper, Martin Scott, Sue Willis using Suunto-Oy compass & clinometer & fibreglass tape to A.S.F. grade 54A.
Surveyed length: 62m
Surveyed depth: 8m

Section B-B'



Section C-C'

Section D-D'

Scale of original 1:200

0 5 10m

L Cooper A4 draft, 25/2/1992

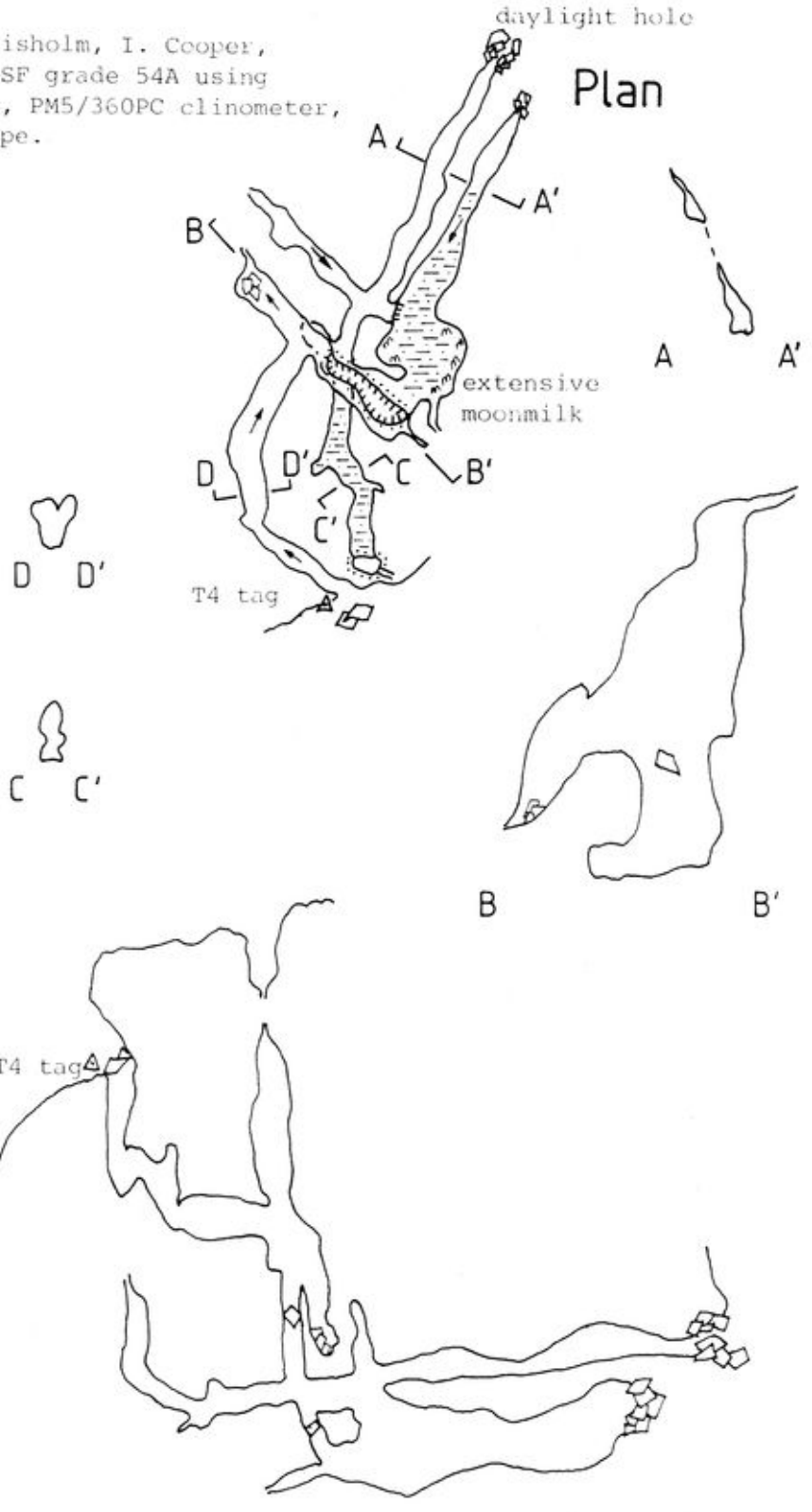
2T3.SUS1

T4 MOONMILK CAVE

Tuglow N.S.W.

Surveyed 22/3/1992 by J. Chisholm, I. Cooper, C. Norton, & S. Tidman to ASF grade 54A using Suunto-Oy KB20/360R compass, PM5/360PC clinometer, & Toolmac 30m fibreglass tape.

Length: 60m
Depth: 12m



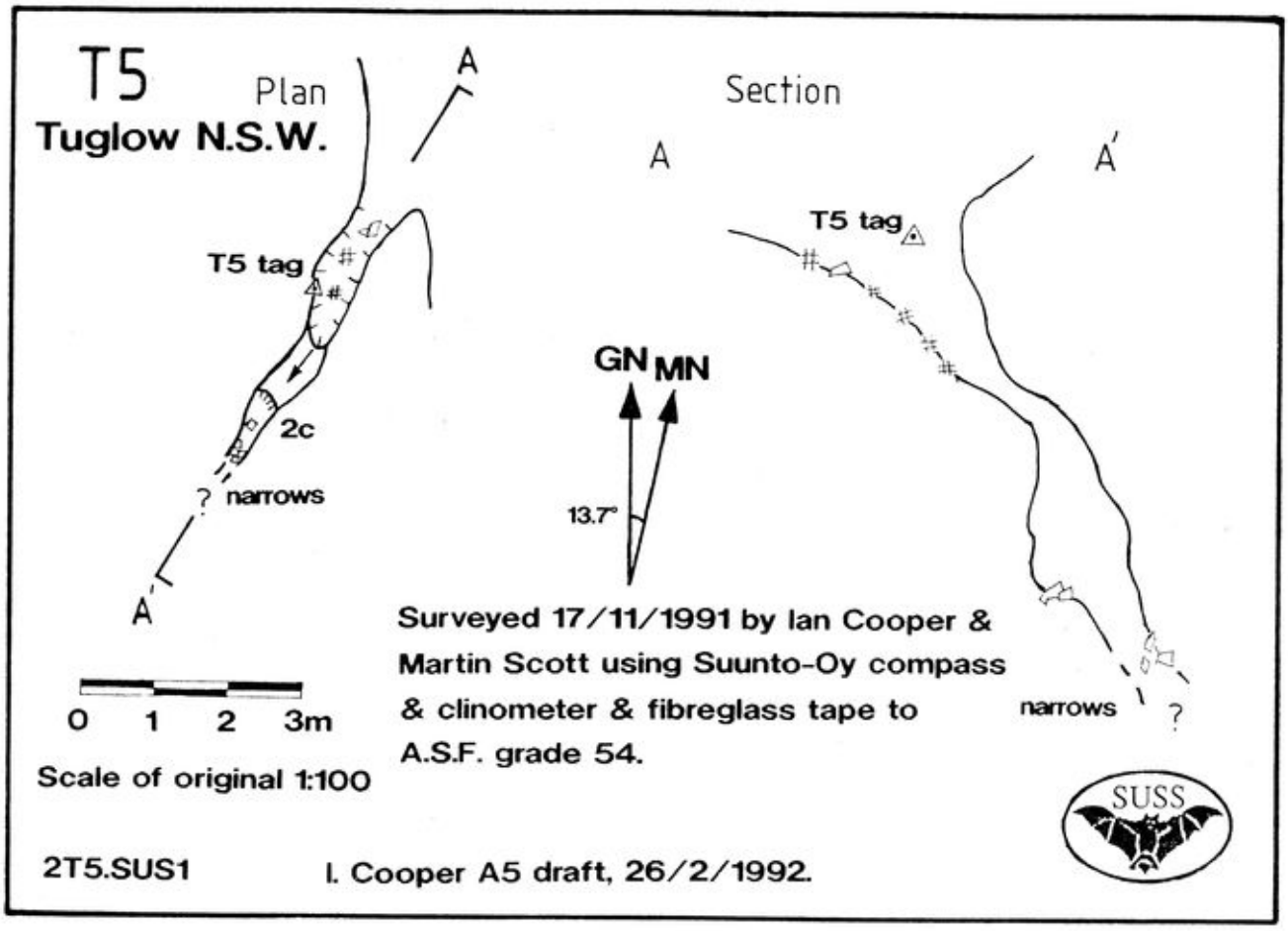
Scale of original, 1:200

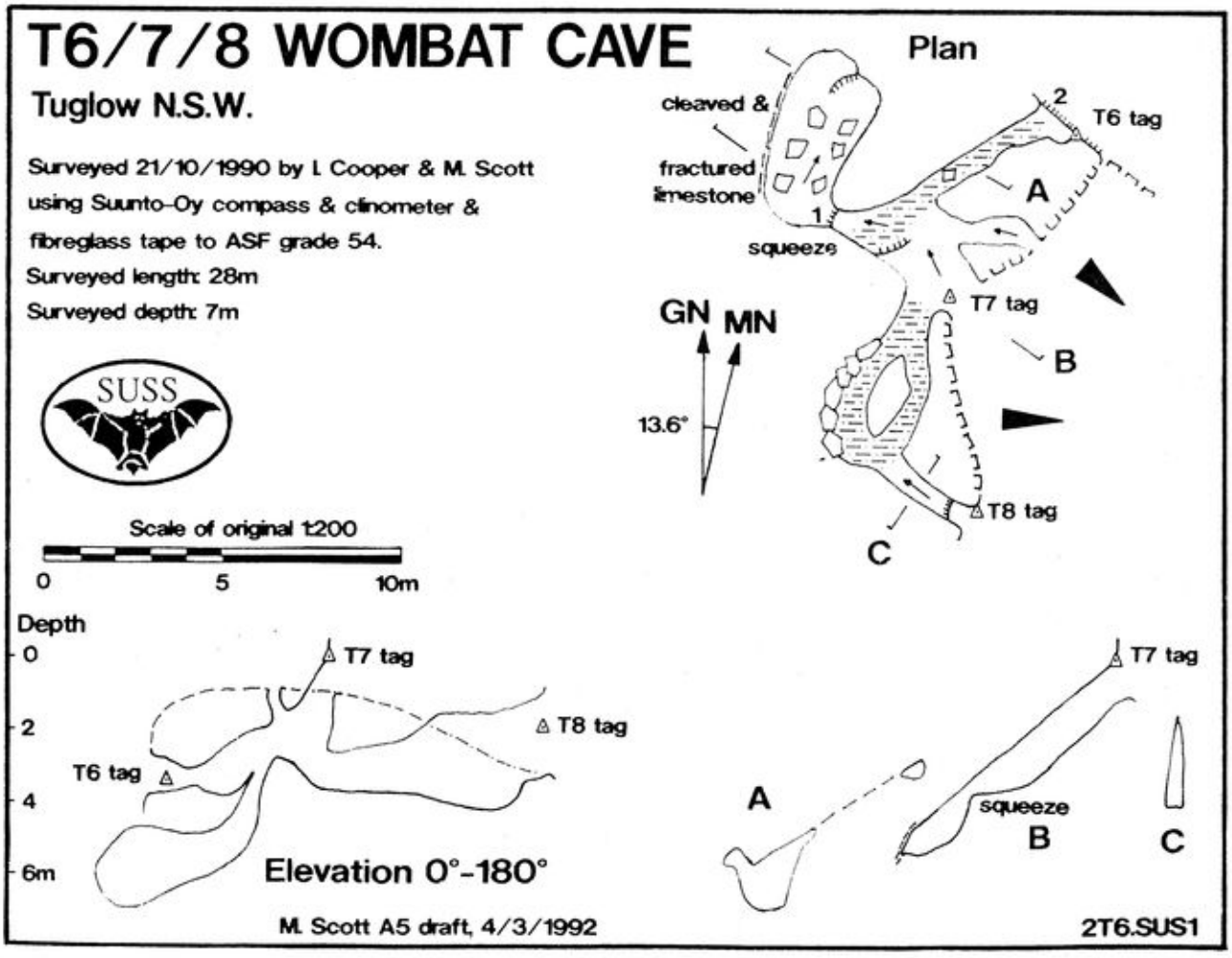
0 5 10 15m

Elevation 215° – 015° grid

I. Cooper A4 draft, 26/5/1992

2T4.SUS1


T5
Tuglow N.S.W.
Plan
A
A'
T5 tag
2c
? narrows
GN MN
13.7°
0 1 2 3m
Scale of original 1:100
Section
A
A'
T5 tag
narrows ?
Surveyed 17/11/1991 by Ian Cooper & Martin Scott using Suunto-Oy compass & clinometer & fibreglass tape to A.S.F. grade 54.
SUSS
2T5.SUS1
I. Cooper A5 draft, 26/2/1992.


T6/7/8 WOMBAT CAVE
Tuglow N.S.W.
Surveyed 21/10/1990 by I. Cooper & M. Scott using Suunto-Oy compass & clinometer & fibreglass tape to ASF grade 54.
Surveyed length: 28m
Surveyed depth: 7m
SUSS
Scale of original 1:200
0 5 10m
Plan
cleaved & fractured limestone
1
2
T6 tag
A
squeeze
T7 tag
B
GN MN
13.6°
T8 tag
C
Depth
0
2
4
6m
T7 tag
T8 tag
T6 tag
Elevation 0°-180°
T7 tag
A
squeeze
B
C
M. Scott A5 draft, 4/3/1992
2T6.SUS1

T4 Moonmilk Cave Length: 60m Depth 12m

Moonmilk Cave is located on the northern side of Window Valley, opposite T23. The first reported exploration of the cave was by BMSC in 1967 (Nelson 1968). The cave is named after the notable moonmilk formations which cover the walls in the lowest section (Nelson 1968). BMSC surveyed the cave in 1976 and a map was published by Bogg(1988).

Moonmilk Cave is essentially a number of narrow vadose rifts that converge towards the bottom of the cave. Two passages in the north trend and slope gently SSW towards the bottom of the cave. The uppermost of the two passages connects with the surface through as small daylight hole. These two passages have developed by solution from the northern edge of the limestone bluff along the same steeply east dipping plane (section A-A'). Avens and rifts (including the entrance rift) also converge towards the bottom of the cave, and have developed by solution from water funnelled from surface depressions.

The rifts are extensively encrusted by moonmilk and cave coral, making caving particularly awkward. Numerous bones were uncovered by BMSC in a dig at the bottom of the cave (Thomas 1971). A cool draught coming from a narrow crevice in the cave (Thomas 1971) is possibly due to airflow from the surface.

T5

T5 is a tight rift leading from a solution doline about 50m east of T1. The cave was found by BMSC, who spent some time digging in the cave in early 1970's (Pickering 1970, Baker 1970, Thomas 1971). The cave drops down a climb to a narrow slot with passage continuing below the constriction. Prospects for continuing with digging in the cave do not appear all that good.

Wombat Cave (T6/7/8) Length: 28m Depth: 7m

Wombat Cave is located some 50m north of Moonmilk Cave, at the top of a sloping limestone pavement overlooking the Kowmung River. The cave was named by BMSC after a wombat living in the cave, that had worn rocks in its path to and from the T6 entrance.

Wombat Cave has developed by solution preferentially along NW dipping cleavage and fractures in massive limestone, as shown by sections A & B. The passage leading from the T8 entrance is a high narrow rift although the roof drops almost immediately, forming low-roofed passages that head north. The lower chamber is choked with rocks at the bottom and prospects for digging appear pretty dismal, although Bogg(1988) considers it a possibility.

Wombat Cave was probably initially explored and also surveyed by UNSWSS in 1972 (Pavey 1972c,d), although no map was published. The cave was rediscovered by BMSC in 1975 (Bogg 1975) and tagged T16/17/18 and surveyed in 1976 (Richard 1977). The BMSC survey was published by Bogg(1988). The cave must have been retagged T6/7/8 by UNSWSS sometime after 1976.

T9 Waterfall Cave Length: 11m

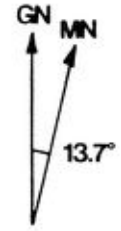
Waterfall Cave is the main resurgence for waters flowing through Tuglow Cave from the Horse Gully Creek Sink. The cave is located 30m west of and 20m above the Kowmung River. The entrance is beneath a limestone boulder at the top of a boulder slope and surrounded by blackberries. The cave is named Waterfall Cave after the small waterfall inside the cave (Bogg 1988).

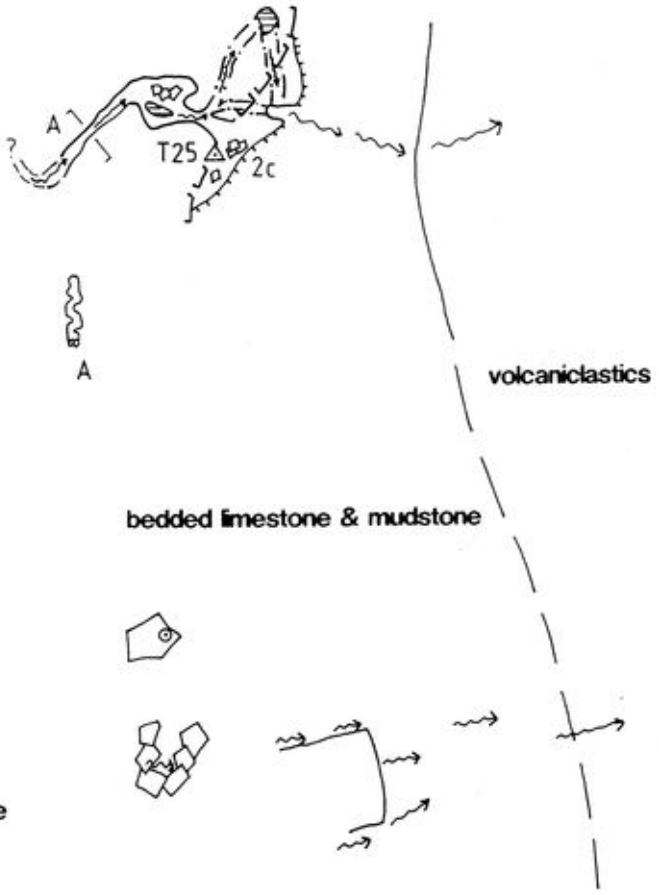
From the entrance it is an awkward ascent and descent through a rockpile to a pool. The cave is basically a rockpile that has formed from the collapse of an old cave roof unable to support itself near the surface. The short distance to the surface is evident from the number of daylight holes amongst the rockpile in the cave. Upstream of the waterfall the cave has solid limestone walls and roof, indicating the cave is heading into the hill well below the surface.

The pool is fed by a stream dropping down a small (<1m) waterfall. Tufa and rocks in the constricted passage prevent access further upstream of the pool. From the pool the stream sinks beneath a boulder,

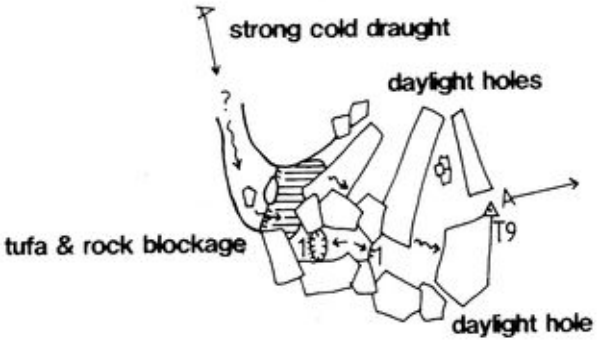
T9 WATERFALL CAVE

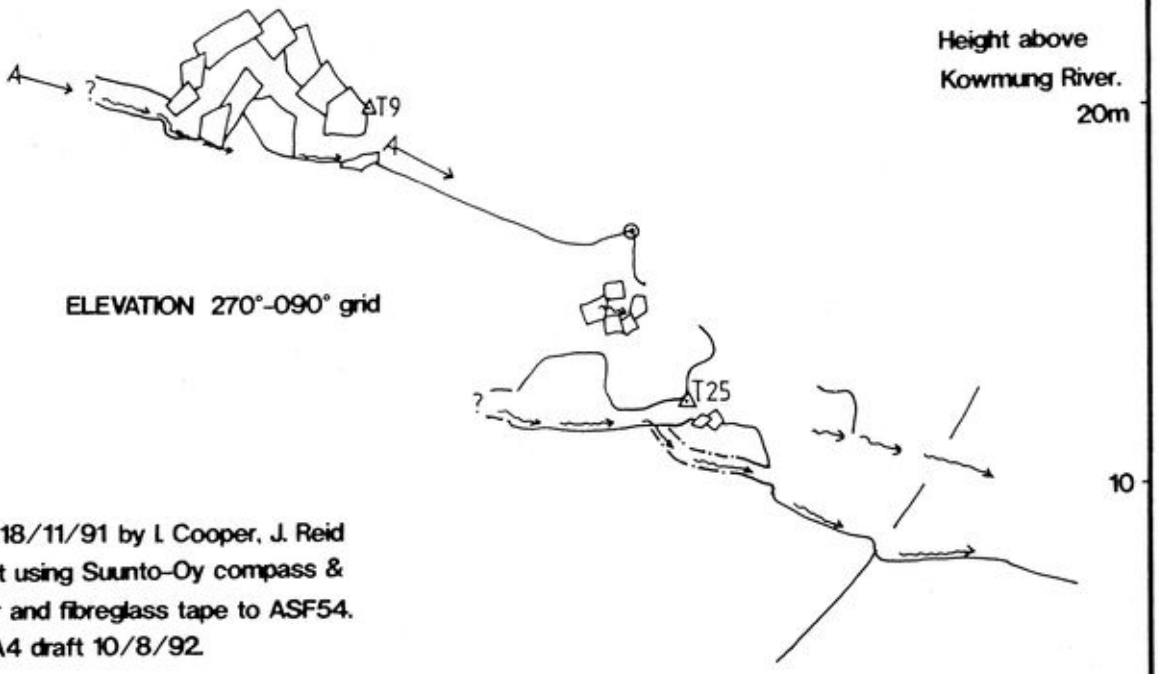
T25 TUGLOW N.S.W.





PLAN





ELEVATION 270°-090° grid

Surveyed 18/11/91 by I. Cooper, J. Reid & M. Scott using Suunto-Oy compass & clinometer and fibreglass tape to ASF54.
M. Scott A4 draft 10/8/92.

SUSS

Scale of original 1:200.

0 5 10m

2T9.SUS1 2T25.SUS1

and reemerges briefly near the entrance before sinking again under a boulder. After leaving Waterfall Cave, the stream can be seen between boulders 10m down the slope and resurges further down the slope beneath a boulder surrounded by tufa deposits (see map).

Waterfall Cave has excellent prospects for finding more of the underground stream in the Tuglow karst and possibly a way into Tuglow Cave. Waterfall Cave is about 100m north of the Tuglow Cave downstream sumps and at approximately the same level. A strong cold draught blows through Waterfall Cave from upstream of the waterfall to the entrance. This draught may indicate an air connection to Tuglow Cave or another entrance on the hillslope. However, the constricted passages upstream in Waterfall Cave would be difficult to push along and require considerable digging to continue.

The cave was probably initially explored and also surveyed by UNSWSS in 1972 (Pavey 1972c,d), although no map was published. The cave was rediscovered by BMSC in 1975 (Bogg 1975) and surveyed and tagged T19 in 1976 (Richard 1977), and the map published by Bogg(1988). Sometime after 1976 the cave was retagged T9 after the initial UNSWSS number allocation.

T10 Pushhi Cave Length: 290m Depth: 38m

The entrance to Pushhi Cave is at the base of a doline that receives floodwaters of Horse Gully Creek. As the doline is a streamsink, it has undoubtedly been investigated by cavers for a number of years in the hope of finding the underground Horse Gully Creek upstream of Tuglow Cave. In 1990 SUSS did some digging in the doline (Cooper 1990), but were detracted by the instability of the boulders and the apparent amount of work required to get anywhere.

Surprisingly, a number of separate caving groups were involved in the exploration of Pushhi Cave. In early 1992, a boulder blockage was removed and a squeeze enlarged to reveal cave passages heading south and descending climbs to the top of a 4m pitch. Without a ladder, the initial exploration party headed out determined to return soon to push the exciting lead. Subsequently another party must have either by chance stumbled onto the new cave or heard about the discoveries, descended the pitch with a ladder and followed the dry streamway passage down to an impassable constriction.

Yet another group, SUSS, stumbled onto the open cave whilst surveying caves at the Horse Gully Sinks for the Tuglow project. Not having a ladder on them, the SUSS group freeclimbed and jumped down the pitch and discovered the upper level by climbing a 5m high sediment bank just past an impressive dyke. On this same trip, SUSS managed to survey from the entrance down to the streamway choke. SUSS continued the exploration and survey of Pushhi during 1992, aswell as tagging the cave T10. New passages were discovered by climbing into the large decorated higher levels which extend to above the level of the entrance doline. The higher level get to within 5m of the surface, as evident by the tree roots and a live rat (October 1992) in the upper passage at section F on the map. A boulder constriction in the floor of the upper level was enlarged and descended to a small strongly-draughting phreatic tube which proved to be extremely hard to move up due to the copious amounts of slippery mud. At the end of the phreatic tube is a drop, that was laddered by the initial explorers down some rifts to two draughting gravel-filled leads. One of the rifts was subsequently found to connect through a small hole to the overlying impassable constriction. A steep slope in the southern end of the cave was precariously climbed up to The Belfry, inhabited by two Horseshoe Bats. A high lead descending into the western side of the upper level was climbed using a bolt, revealing impressive helictites and a shaft dropping to a mud-filled choke. The choke was excavated and connected with the upper level below the high climbing lead.

Pushhi Cave acts as a large funnel collecting drainage from the entrance doline and the hillside to the south. During flooding, Horse Gully Creek flows into the entrance doline and immediately sinks in the entrance rockpile, to reemerge in the lower level upstream of the base of the 4m pitch. Streamflow continues southwards along gravel-floored passages past the dyke, and descends a number of drops, through the constriction and rifts, to the draughting leads at the bottom of the cave.

Drainage from the surface descends avens and the decorated higher levels and lead into the upper level. Drainage from the eastern higher levels sinks in the floor of the upper level, and probably drain to the bottom of the cave. The Belfry drains down the steep slope, through the boulder constriction and southwards through the muddy phreatic tube to the strongly-draughting tubes at the bottom of the cave.

T10 PUSHHI CAVE
T22

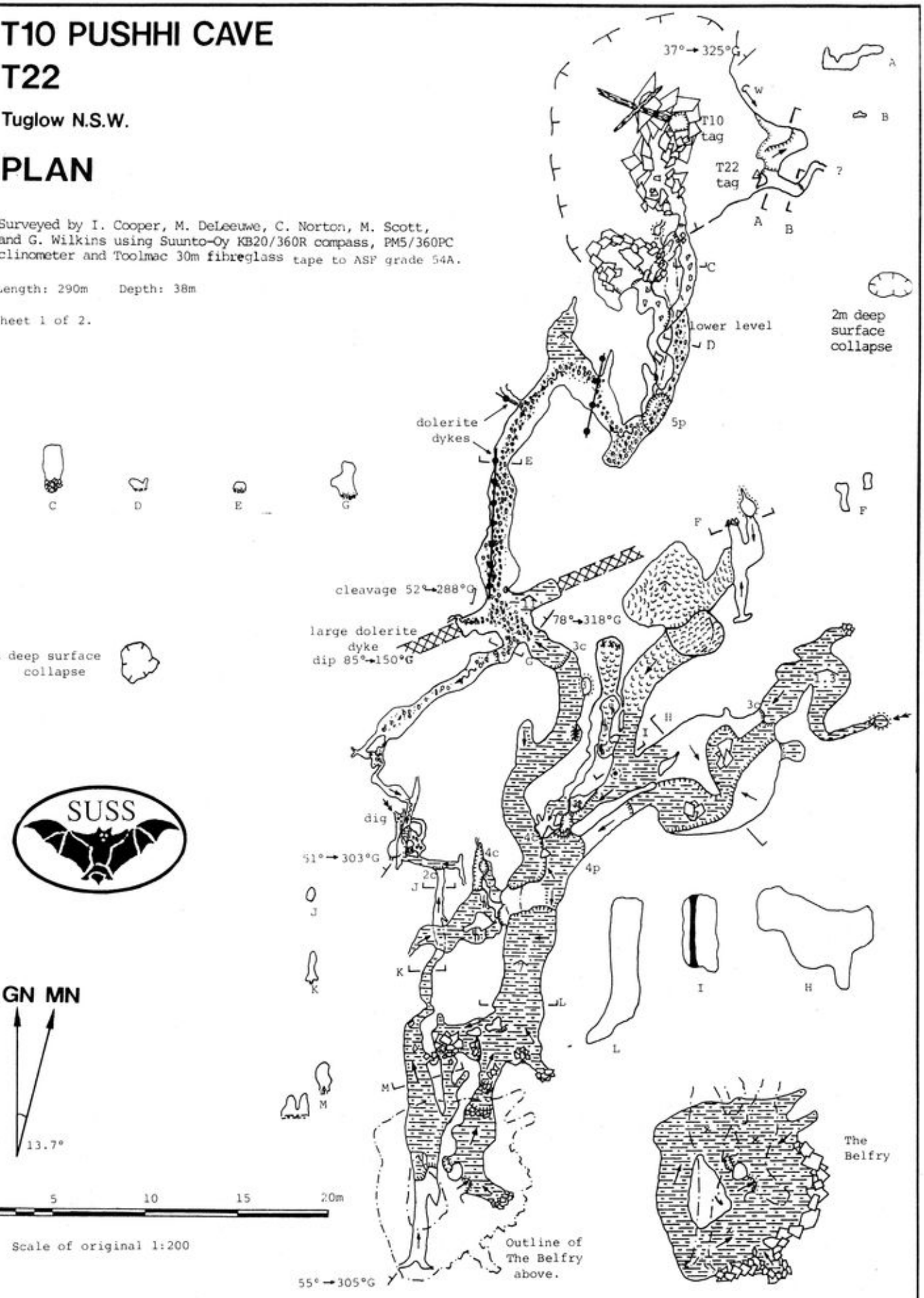
Tuglow N.S.W.

PLAN

Surveyed by I. Cooper, M. DeLeeuwe, C. Norton, M. Scott, and G. Wilkins using Suunto-Oy KB20/360R compass, PM5/360PC clinometer and Toolmac 30m fibreglass tape to ASF grade 54A.

Length: 290m Depth: 38m

Sheet 1 of 2.



I. Cooper A3 draft 4/11/1992.

2T10.SUS1 2T22.SUS1

T10 PUSHHI CAVE
T22

Tuglow N.S.W.

Elevation 0° - 180°

No vertical exaggeration.

Sheet 2 of 2.

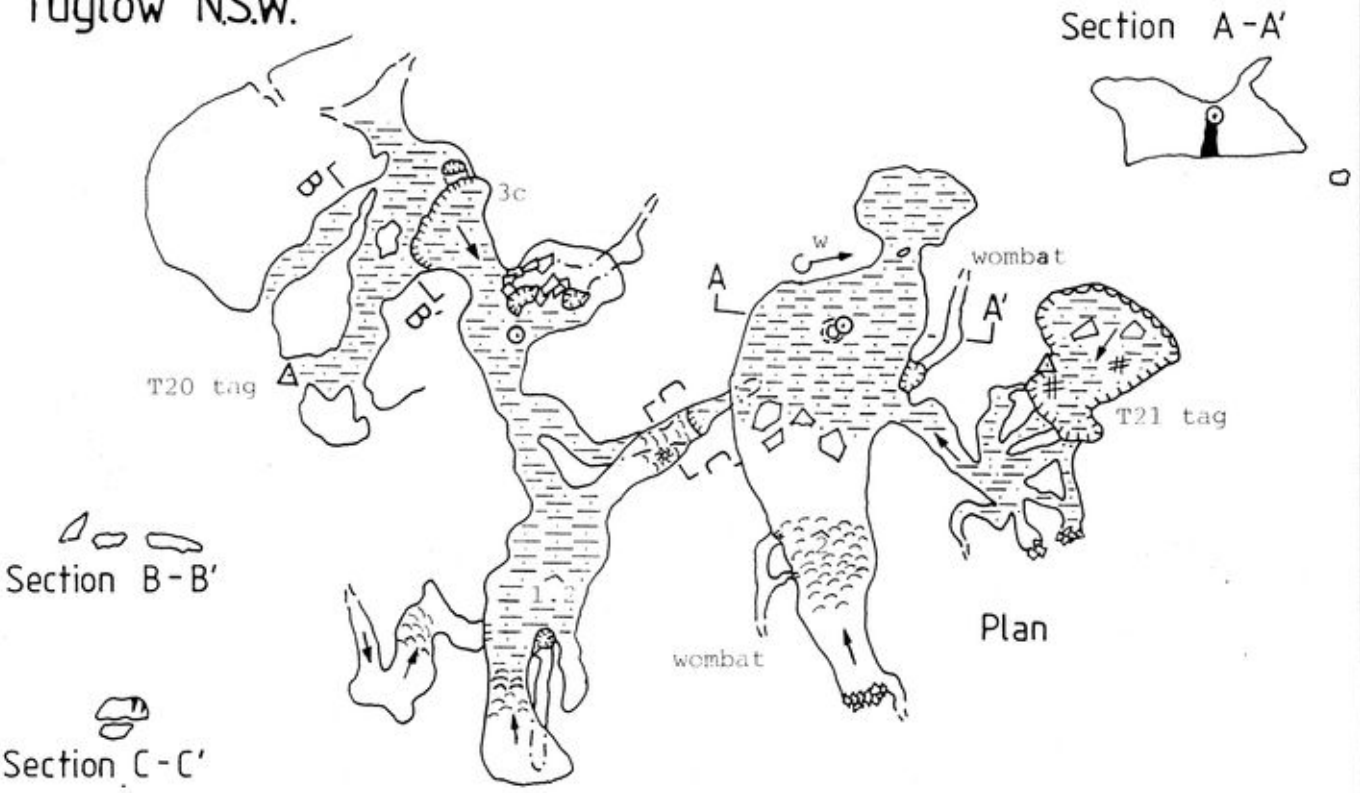
Scale of original, 1:200.

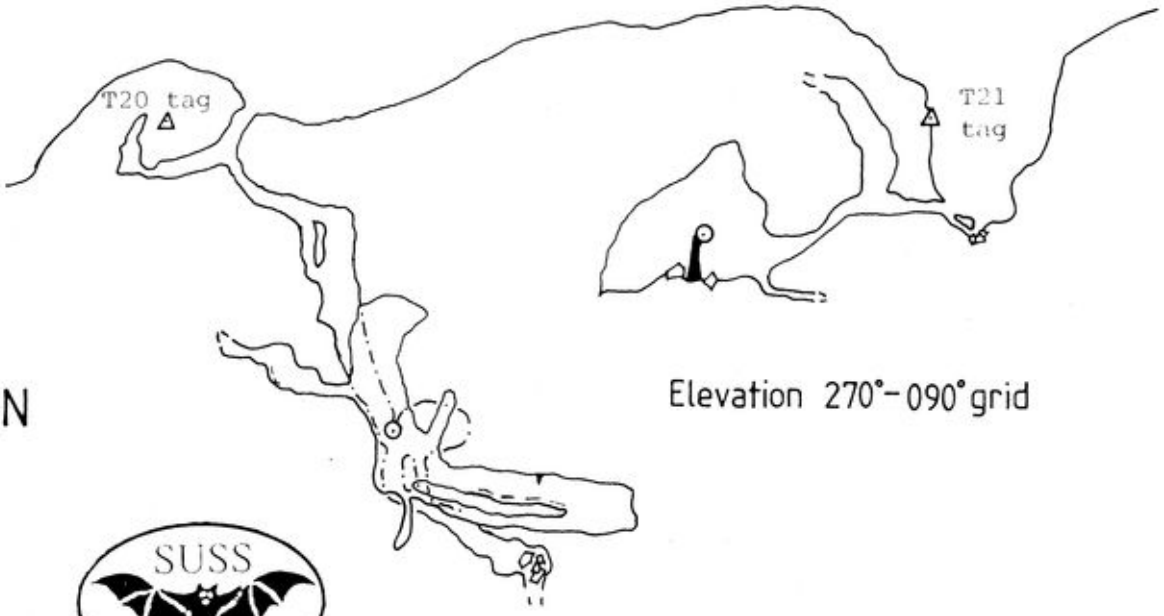
0 5 10 15m

I. Cooper A3 draft 13/11/1992 2T10.SUS1 2T22.SUS1

T20 Horse Gully Cave
T21 Temple of Wom

Tuglow N.S.W.





SUSS

Surveyed 11/7/1990 by I. Cooper and M. Scott to ASF grade 54A using Suunto-Oy compass & clinometer & 30m fibreglass tape.

T20 length: 60m T21 length: 30m

T20 depth: 12m T21 depth: 5m

Scale of original 1:200

0 5 10 15m

2T20.SUS3 2T21.SUS2

I. Cooper A4 draft, 11/6/1992.

Pushhi Cave also receives drainage from small gravel-filled tubes immediately north of the dyke. These tubes presumably drain from dolines to the west of the entrance and limestone on the hillside north of the dyke. Old water levels in the upper decorated levels indicate that the cave has previously been flooded to approximately level with the entrance doline. Extreme flooding must exceed the drainage capacity of the small tubes at the bottom of the cave, causing backing up of water in the cave. The size and location of the higher level passages and The Belfry suggest that Horse Gully Creek used to sink on the hillslope above Pushhi. The sinks and valley for Horse Gully Creek have since migrated down the hillslope and westwards to their present locations.

The best digging prospect in the cave is the strongly-draughting tubes at the bottom of the cave. These tubes are nearly filled with sediment, and require digging to progress. The bottom of the cave is approximately 5m above the level of the upstream sump in Tuglow Cave, suggesting the strongly-draughting tubes are very close to the underground Horse Gully Creek. If the stream is not encountered soon, this may suggest that Pushhi Cave is in a different hydrological system to Tuglow Cave.

T11 Tuglow Hole Spring

The Tuglow Hole Spring lies to the south of the other caves at Tuglow. The spring discharges water from an impenetrable hole floored by siltstone and surrounded by limestone boulders. Presumably the water is derived from the partial sinking of a tributary of Tuglow Hole Creek 800m SW of the spring. The water then flows underground along the strike of the limestone to emerge at the spring, beside the Hollanders Fault.

T20 Horse Gully Cave Length: 60m Depth: 12m

The entrance to Horse Gully Cave is located in a doline south of Horse Gully Creek, above the alluvial terraces and towards the top of the limestone outcrops. Maps of the cave have been published by SUSS (Muezenreider 1971a, Cooper 1990). Muezenreider (1971a) reports that the cave had been entered before 1970, although infrequently.

There are a number of entrances into Horse Gully Cave. The tagged entrance leads to a silt-floored passage to the top of a 3m climb and past another entrance in boulders in the roof. Another entrance leads to a parallel rift and connects through a tight squeeze immediately above the climb. Narrow passages to the north of the climb are inhabited by a wombat and probably lead to the surface. A tape may assist on the 3m climb and the following slope which descends through boulders to a choked rift at the bottom of the cave. A crawl to the south opens into a small silt-floored chamber with a number of side passages. To the NE is a phreatic tube with a flowstone false floor (section C-C') which lies 5m below the main chamber of the cave T21 Temple of Wom (elevation). Ascending passages to the south are flowstone-floored and choked by rockpile in the roof. A hole in the floor of the small chamber descends through the silt floor and narrows progressively to the south.

The NSW State Liaison Council Cave Numbering and Nomenclature Committee approved the name Horse Gully Cave and number T6 for the cave (Pavey 1972b). Names suggested for the cave include "Listing's Hole" (M. Listing, addendum to Muezenreider 1971a) and "Cave Around The Corner" (Cooper 1990), but the approved name of Horse Gully Cave is used on the new map. The tag T6 has been attached to an entrance of Wombat Cave, so Horse Gully Cave was retagged T20 by SUSS (Cooper 1990).

A number of bones, some partially calcified, are embedded in red-coloured deposits on the eastern wall at the bottom of the cave. Muezenreider(1971b) collected numerous bones from the cave, most of which were thought to be marsupials or rats with larger bones, including skulls, possibly of wombats or kangaroos. Cooper(1990) reports bones at the same site ranging from fine ?bird bones to 0.3m long leg bones. The bones and red sediment deposits on the eastern wall are now covered by boulders to protect them from damage.

Muezenreider (1971b) makes some interesting observations about the history of the cave which are expanded herein. The abundance of alluvium and rock debris in the cave, indicate that the cave has filled with sediment in the past. Dates on the bones collected by Muezenreider (1971a) would give an indication of the age of deposition, although detailed stratigraphic studies need to be undertaken. After this period of deposition, the sediment has been eroded and presumably transported into underlying

caverns related to the subterranean drainage of Horse Gully Creek on its way to Tuglow Cave. Erosion has exposed a sedimentary sequence up to 6m high at the climb below the entrance (see elevation on map).

SUSS did some digging at the bottom of the cave in 1970/71(Muezenreider 1971a,b), 1990 (Cooper 1990) and 1991, but without much progress. The narrowness of the rift, sediment choking of the bottom of the cave and the lack of draught indicate that this digging site is not going to be productive. Two narrow leads in the northern part of the cave are inhabited by a wombat and used as a way to the surface. Other leads in the cave are rockpiles at the top of climbs over old flowstone in the south of the cave, although tree roots in the roof indicate that the rockpiles are likely to head towards the surface. A hole in the floor of the south of the cave leads to a very constricted passage making digging very difficult and therefore has slim prospects for continuation.

T21 Temple of Wom Length: 30m Depth: 5m

In a doline 20m east of Horse Gully Cave is a cave tagged T21 and named Temple of Wom after the numerous wombats inhabiting the cave and a shrine-like stalagmite in the main chamber (Cooper 1990). In 1990 SUSS set up a hauling system to remove a boulder from the base of the doline and enlarged a narrow phreatic passage to emerge into a sizable phreatic chamber (Cooper 1990). This cave may have been visited previously as there are references to two small caves (presumably Horse Gully Cave and Temple of Wom) on the Horse Gully limestone bluff (Pickering 1970, Pavey 1971a).

Three passages lead from the doline into the cave, although the lowermost is the only one that is enterable through a squeeze. The three passages converge with others descending from rockpile choked avens and descend down a sediment-floored ramp to a 16m long, 6m wide and 3m high phreatic chamber. The southern end of the chamber has three small leads inhabited by wombats and a dry flowstone and rockpile blocking the top of the slope. The northern end of the chamber is silt-floored, has a 2m high stalagmite and the roof drops towards the north. Scalloping on the wall indicates phreatic water flow from south to north through the chamber. A hole in the sediment floor of the chamber leads to a narrow passage inhabited by a wombat at the bottom of the cave. The only likely exploration prospects in the cave are the small holes inhabited by wombats.

Some ideas on the development of Temple of Wom and its relationship with Horse Gully Cave is discussed below. Phreatic waters forming Temple of Wom have either been derived from surface drainage on non-soluble rocks on the hillslope to the south, sinking at the limestone contact immediately south of the cave, or the main chamber is an old pathway for the subterranean Horse Gully Creek. Phreatic drainage has flowed from south to north through the main chamber of Temple of Wom and through the smaller phreatic passages below the doline. Over time the phreatic level lowered and drainage was probably diverted to Horse Gully Cave, where waters also flowed from south to north. As the water level dropped in Temple of Wom, sediment and formations were deposited and vadose drainage from the surface dropped down avens and the doline. Previous (and present) vadose drainage through Temple of Wom has flowed to the underlying Horse Gully Cave.

T22 Length: 7m

Floodwaters of Horse Gully Creek flow past the normal alluvial sink to a doline 150m to the NE. Horse Gully Creek has formed large SE-directed scallops at the base of a 5m limestone cliff that forms the eastern wall of the doline. Floodwaters sinking along the wall of the doline have formed a small cave tagged T22. The cave consists of two passages heading eastwards, but both are heavily filled with sediment. The lower passage to the north continues only 3m from the overhang and is still in daylight. Below the tag is a small disused wombat tunnel which continues horizontally for 6m before narrowing.

The cave has undoubtedly been looked at by many cavers over the years. SUSS tagged the cave T22 in 1990 (Cooper 1990), and spent some time digging there in 1990 and 1991. The sediment filling and the lack of draught suggest the cave has poor digging prospects, although a small surface collapse 5m to the SE may indicate larger cave passages nearby.

T23 Length: 4m

T23 is a small cave at the base of a limestone cliff overlooking the Kowmung River, 15m south of Window Valley at the same level as the change of slope of the valley. The cave was tagged and

surveyed by SUSS in 1990. T23 is a small cave with a squeeze just past the entrance and a small chamber choked by flowstone, and rocks and sediment on the floor. Passage shape and scalloping on the wall indicates previous phreatic flow eastwards through the cave.

T23 is 2m lower and 6m NE of the eastern end of Window Cave (see map). Surveying of T23 and Window Cave and a surface traverse between the caves shows that T23 was part of Window Cave before sedimentation filled the passage between the caves. Previously phreatic waters have flowed eastwards through T23 from the eastern end of Window Cave. This relationship between T23 and Window Cave was initially reported by Pavey(1971c) from the results of surveying by UNSWSS.

T25 Length: 15m

T25 is a small resurgence cave 20m east of and 10m above the northern end of the Kowmung River pool. The cave has formed in bedded limestone and mudstone just above the basal contact with a volcaniclastic sequence. The first known report of a visit to the cave is by Cooper(1990), when SUSS found the entrance after chopping their way through thick blackberry bushes.

Water flows out of a small passage at the base of a 2m cliff and can be traced to a small pool in a sharp bend in the cave passage. The passage is constricted upstream of the pool, but the stream can be followed along passage leading from the T25 tag on the surface. After passing a squeeze, the roof height increases and the stream can be followed past another pool along vadose passage with channel incuts (section A) until the stream turns NW and becomes too narrow. The lack of draught and the constricted nature of the passage are not promising for easy digging upstream.

The volume of water flowing out of T25 is less than the major resurgence T9. Water flows out of T25 at a lower level than out of T9 (see elevation). Water flowing out of T25 could either be water derived from tributaries of Kowmung River sinking upon reaching limestone immediately to the west, or from Horse Gully Creek and Tuglow Cave. If the water is from Horse Gully Creek and Tuglow Cave, the lower level of T25 suggests that this cave is in the process of capturing the water from T9.

REFERENCES

Anon. 1960: Caving Activities. *UNSWSS Annual Report 1959-1960*, 3-4.
Baker L. 1970: Tuglow. *Oolite* **2(1)**, 17-18.
Bogg I. 1975: Tuglow Caves. *Oolite* **7(1-3)**, 28.
Bogg I. 1988: Tuglow. *Oolite* **17**, 12-15.
Cooper I. 1990: Four new tags at Tuglow. *SUSS Bull.* **30(2)**, 26-29.
Muezenreider L. 1971a: Tuglow Area, 28, 29 Nov, 1970. *SUSS Newsl.* **10(8)**, 57-58.
Muezenreider L. 1971b: Tuglow - November 20-21st. "Fishing, Digging, Bone Collecting, Postulating.....". *SUSS Bull.* **11(6)**, 67.
Nelson G. 1968: Tuglow and Hollander's River. *Down Under (Oolite)* **1(1)**, 20-22.
Patterson G. 1973: Extension of Window Cave (T2). *Spar* **27**, 14.
Pavey A. 1971a: Tuglow. *Spar* **5**, 8.
Pavey A. 1971b: Window (T2) & Pleistocene (T3) Cave maps. *Spar* **10**, 8-10.
Pavey A. 1971c: Surveying at Tuglow - some results. *Spar* **11**, 5.
Pavey A. 1972a: *An Index to Cave Maps in NSW*. The NSW Liaison Council of the Australian Speleological Federation. 52pp.
Pavey A. 1972b: Cave Notes. *Spar* **14**, 5.
Pavey A. 1972c: Surface and underground surveying at Tuglow. *Spar* **15**, 12-13.
Pavey A. 1972d: Cave Surveys - List 3. *Spar* **17**, 23-25.
Pavey A. 1974: Tuglow.*In* Matthews P.G.(ed.) 1985: Australian Karst Index. ASF Inc.
Pickering K. 1970: Tuglow Area. *Oolite* **2(2)**, 14-15.
Richard B. 1977: Tuglow 26th-27th June 1976. *Oolite* **9(1)**, 4.
Scott M. 1988: To Hell and back dragging a detonated bomb in Tuglow.*SUSS Bull.* **28(2)**, 9-11.
Scott M. 1990: The End of the Tuglow Cave Survey? *SUSS Bull.* **30(1)**, 40-41.
Scott M. 1991: Palaezoic stratigraphy and structure of the Tuglow district, N.S.W. MSc thesis, University of Sydney.
Thomas R. 1971: Tuglow. *Oolite* **3(2)**, 13.
Trickett O. 1898: Tuglow Caves. *A. Rep. Dep. Mines & Agric. for 1897*, 205-6 + plan 11.

SUSS Bull 32 (4): 20

Double bid to keep Jenolan safe

By AMANDA MEADE
Local Government Writer

A meeting at Jenolan Caves yesterday resolved to ask the Federal Government for several million dollars to save the popular spot from the twin evils of unsympathetic development and environmental degradation.

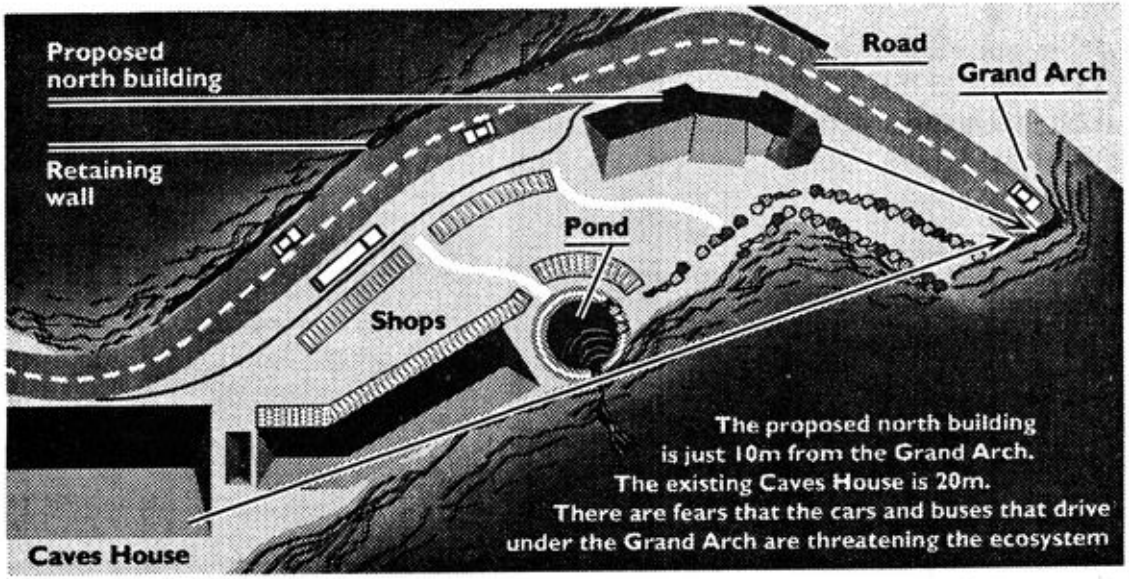
The meeting — called by the Jenolan Caves Trust to speak to a group of conservationists, speleologists (cavers) and the National Trust — resolved to call on the Commonwealth for between $2 million and $6 million to divert the road which runs under the Grand Arch.

They fear the fumes from the thousands of cars and tourist buses which pass through the Grand Arch precinct are destroying the delicate ecosystem of the caves and threatening the rare spider colony.

The meeting was held to address fears — expressed by the Australian Speleological Federation, the National Trust and conservation groups — that a development approval before Oberon Shire was highly inappropriate for the site.

Oberon Shire has already approved rezoning of the area for tourism to facilitate the development.

Mr Stephen Davies, the conservation director for the National Trust, said after the meeting that one of the proposed buildings, the two-storey North Building, was too close to the Grand Arch.



The existing Cave House, which is badly in need of repair, is approximately 20 metres from the Grand Arch but the proposed building is just 10 metres.

The Jenolan Caves Trust has argued that the new tourist facilities need to be close to the caves.

The proposed building work would alter the drainage system which, in turn, might eventually stop water percolation through the rock and ultimately stop the limestone from forming, Mr Davies said.

A $40,000 feasibility study to look at the cost of the alternative road was a necessity, he said.

"Everywhere else in the world where you have an area of national significance and potential World Heritage listing there is co-operation between State and Federal governments."

The acting chairman of the Jenolan Caves Trust, Mr Derek Sinclair, said yesterday that he had agreed to put the development application on the back burner.

It is understood the change of heart by the Jenolan Caves Trust has come about as a result of the changed composition of the board, which now has representatives from the National Trust and speleological groups.

The trust also includes representatives of the NSW Tourism Commission, Oberon Shire Council, the National Parks and Wildlife Service and the Peppers Hotel Group, holders of a 99-year lease on Jenolan Caves House.

The lack of a proper environmental impact study of possible effects on the fragile ecosystem was of major concern to objectors.

Sydney Morning Herald

Deep, Dark, Wet

John Oxley

Have you ever been through an active streamway cave? Imagine a narrow vadose passageway snaking through the rock with the sound of a roaring waterfall ahead. Abseil down the waterfall - *in* the waterfall - splash into a deep icy pool at the bottom then pull the rope down. No retreat now. Continue along the creek - another pool, another swim. The only light is from the glowworms on the rocks above you and from your torches. You haul yourself out of the water and through a squeeze, then another swim then, ah! daylight!

You're not in Europe or New Zealand or even Tasmania. This is the northern Blue Mountains and this is just one of the dozens of caves in the area. Well, not caves, canyons. The rock is sandstone, not limestone and over the aeons the water has carved deep slots into the layers creating waterfalls, deep swirlpools and scalloping in the walls of the canyons. Now the rock is covered in mosses and lichens and ferns grow in every crack. Spiders spin their webs between the walls and drops of mist glisten on the webs as light catches them from above. In the narrower canyons you can see only a thin strip of sky and direct sunlight reaches the canyon floor for only a few minutes each day. In some places the sun never reaches the floor. The canyon is completely covered by boulders which have crashed in from the cliffs above and become jammed high in the narrow fissure. When you move out of the narrower sections and into the sunlight you'll see blue yabbies, tiny native fish and sunning themselves on the rocks, spectacular water dragons.

Where there are lots of long deep pools the canyon is best negotiated on a lilo so you can drift along quietly, taking in the scenery. Only some of the canyons require abseiling, but if you just want good abseils then don't go canyoning in the northern Blue Mountains. With a few exceptions the abseils are short, awkward and sometimes dangerous. Abseiling just provides a means of delivering you to the depths of the canyon.

You have to expect to get wet in any canyon. The water is cold too, even in mid summer. On a hot day the air temperature in the canyon can be 10 to 15 degrees lower than that on the ridge tops above. These cool conditions can be a great relief after a long hot walk but can soon have everyone shivering. Many people like to wear full wetsuits in some of the colder canyons. In others just the jacket or a woollen jumper is sufficient. Whatever you choose, be aware that being cold will drain your energy very quickly.

The nature of the canyons means that it can be difficult to find a way out. Reversing the route upstream is usually impossible so you must be sure of an alternative. The alternative is often a steep little gully or a narrow rocky ridge. The valleys of the northern Blue Mountains National Park and the southern Wollemi National Park are not deep. After an initial steep climb the walking is relatively easy.

Unfortunately not all the canyons are in national parks. Large areas are covered with pine forests which are riddled with roads which quickly erode into the creeks and canyons below. Other areas nearby, notably the amazing Gardens of Stone are threatened with subsidence from coal mines.

Despite any negatives the canyons are very much worth the effort of a visit. Keep an eye on the SUSS trip list over summer or ask about any trips at the meetings.

DISCOVERING CAVES IN THE KEMPSEY KARST CRESCENT

September 28 – October 5

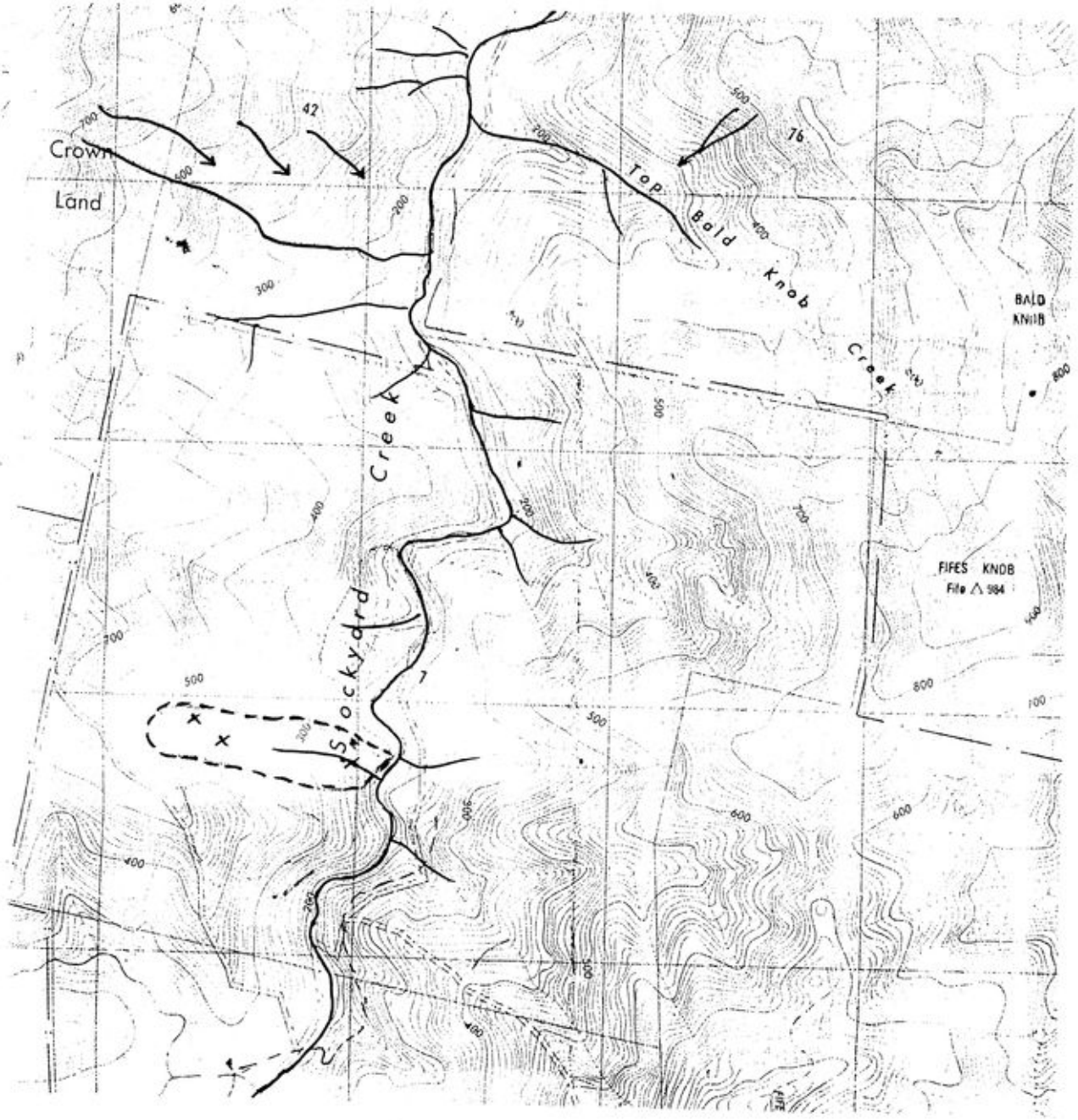
Ian Cooper (TL), Martin Scott, Guy McKanna, Steve Hirst, Kelly Field (SUSS)
Dave and Lyn Collett (Kempsey Speleological Society).

This promised to be one of the most interesting trips of the year for SUSS.
Vast areas of limestone spanning pleasant rural and wilderness environments and mysterious "sinking streams' shown on the topographical map plunging more than 300 metres (1,000 feet) to the main stream below were certainly alluring.
Or was it just our beloved trip leader Ian talking-up the area. Could those sinks shown on the map really be there some 300 metres above Stockyard Creek?
More homework was done. However, a check of the air photographs at the Lands Department did not reveal much, but a second examination of the topographic map revealled yet another sink shown on the other side of Stockyard Creek to the three already spotted.
Was this an unknown belt of limestone? The geological map had the region shown as granite. Were they granite caves?
There was nothing to it – we would have to venture into the wilderness to see for ourselves! Ian had even been to Jenolan the weekend before to warm-up!!
MONDAY: Martin and Guy piled themselves along with 200 metres of rope, tape, chocks, a bolt kit and lots of other gear into Ian's "The Rattler' Kingswood and up the highway towards Kempsey. We were determined that if the map was right and there were caves hidden in the Macleay River wilderness we would be prepared for them.
After a few stops for petrol, food and to visit relatives, we arrived at Yessabah at dusk. After paying our respects to the farmer, upon whose estate we camped, we settled down for the evening's menu included teryaki beef with tandori rice, dreaming of what might be hidden in the Kempsey Karst crescent – this was not to be any ordinary trip.
TUESDAY: The excitement was too much for Guy, who had Ian and Martin up ready to go caving by 8.30 am. But as we set off towards the adjacent Yessabah hill, we were greeted by a surprise. A blue FIAT was parting the cows in the paddock as Steve and Kelly arrived – after having set out at a similar time to ourselves. We later found out the reason for their delay was Steve's habit of wearing a terry-toweline hat while driving – which forced his brain and driving to slow down. During later drives, this hat was confiscated to ensure he kept up with The Rattler. But Steve had another hot hidden in reserve, which had to be removed from his head while in his car. But that was not Steve's most interesting apparel – which was still to be displayed.
Enough of what people wear, or don't wear, caving. We all trogged up the hill, with Ian, Martin and Guy surveying False Floor Cave. A few bats remained in this cave which overlooks the infamous Yessabah limestone quarry.
Daylight Cave was then visited – from the top. After climbing the scenic tower karst, we abseiled down a 23m rift into the large arch, surveying as we went.
Was this a taste of the vertical that was to come?
After lunch, Water Cave was visited, where we were amazed to learn that Keir, (recently promoted to General Kaos, to avoid confusion with Major Kaos McKanna), had actually dived in the bat guano soup sump. Unfortunately we could not find Bat Cave. It must have been in the middle of all the lantana.
Besides lantana and rainforest, the whole Yessabah hill contains numerous clefts and small caverns. Unfortunately, most of these are filled with mud. If this was removed, the hill would resemble a block of swiss cheese. (What a dig for Martin!) The Kempsey Karst is also very interesting in that the limestone features vast amounts of crinoid fossils and is very light in colour.
After a wash in the stream on the other side of the hill, we tramped back to camp where the menu featured egg and spinach fettucini with a ratatouie sauce and Italian vegetables.
WEDNESDAY: We had just about run out of large caves to inspect and survey at Yessabah, se we

decided to head off to Willi Willi. After noting the quarry was turning over its crusher and recrushing rock, we packed up and headed off.
We decided we would restock the roving restaurant as Willi Willi was a fair way out of town. But first, we paid a visit to the beach at South West Rocks – little did we know what was lurking there. Kelly performed a trick that even out-did Mike Lake and a coathanger: she put on her swimming costume while keeping her long-legged stretch pants on. It had to be seen to be believed. But that was not all.
As Guy, Martin, Ian and Kelly left the beach towels and headed for the waves of horseshoe bay, they were pursued by a sinister looking person in long pants and windcheater.
The four only became aware of their pursuer as those already in the water stared, gasped and even laughed in fright at the person following them.
As the intrepid white speleos turned to see what was causing the spectacle, they were horrified to see Steve entering the surf in attire that more suited the 1890s, rather than the 1990s. Steve, a true speleo, did not want to risk his white complexion to the sun, so had decided to leave his long pants and top on while swimming – or was he really just giving his clothes a wash. Whatever the case – it created quite a spectacle for South West Rocks and the dolphins offshore.
All this made us hungry. Martin and Guy found of fresh oysters on a granite boulder just offshore, and filled themselves while clinging to the rock between waves. But the others were not too keen on oysters – so it was off to the pub before heading to Willi Willi.
There we met Lyn and Dave Collet from Kempsey Speleological Society – the owners of the scenic farm where we camped. That evening we dinned on Tandori Chicken with fragrant rice and papadums.
THURSDAY: Up early the next morning, we set off up a small valley, probing dolines as we went. At one, we entered what is known as Deep Cave. This is a very scenic cave, where a daylight hole illuminates the entrance chamber showing the banded nature that is typical of the Kempsey Karst. A small hole leads down into a spectacular rift, at the bottom of which, Marting began digging. After about an hour, Martin had dug his way through some small squeezes into a small chamber. The only problem was that he had dug back up under the rift.
Steve and Kelly, who had to return to Sydney, bade their farewells as Ian, Martin and Guy trogged up hill, towards the top of Mount Sebastapol.
Much limestone in valleys opposite was passed along the way, until the top of Mount Sebastapol (which is home to a 3m long diamond python) which is limestone itself. From the top of the mountain, a spectacular view is obtained of a 70m plus limestone cliff that is about a kilometre long. (Unfortunately the photo's did not turn out).
Continuing over the other side of the mount, we passed a sink where a previously known cave had been. KSS later reported how this entrance to a 10m high well decorated passage by several hundred metres long had collapsed.
Back into the rainforest, we probed for caves. Ian found a hole, but unfortunayely it did not go very far. Further down the hill, we found Figtree Cave (don't look for Figtrees when trying to find this cave). This cave is joint-developed, with parallel passages being connected by climbs and crawls.
Marting and Ian again couldn't help themselves and began digging at the end of one of these rifts – but to no avail. They were still too fat, meaning there was no chance for Guy.
Upon exiting the cave, we continued down the hill through the pleasant rainforest searching for caves – but to no avail. Maybe back towards Mount Sebastapol would have been more fruitfull.
Eventually we bashed through the lantana at the bottom of the hill (don't go anywhere without a machete) and back to camp. After a tiring day, we settled down for the evening's meal of red Thai lamb curry and lightly fried rice. The big caves had still eluded us.
FRIDAY: We decided to look elsewhere today. We piled into The Rattler and drove to Carrai Clearing, where there is a natural arch and a known sink.
The arch is at the end of a scenic paddock, but Guy was most disappointed when he found out he had to bend over to get through the arch. You did not have to do this at Jenolan, Marble Arch and most of the other arches he had visited – was this a sign of what the Kempsey Karst was really like?
But as we were wondering about where the big caves were, we met another KSS member and a UNSWS geological student who marked caves on our topo map and the extent of the limestone.
So off we set again, looking for caves. Nothing was found on block and tackle spur, nor much on the karst hillside behind Lyn and Dave's farmhouse – despite there being some spectacular pinnacle karst formations (alas no photos). Though there are some possible digs at at the bottom of rifts at the top and eastern sides of the hill.
So we retired for a dinner of stir-fried Chinese vegetables in oyster sauce accompanied by braised

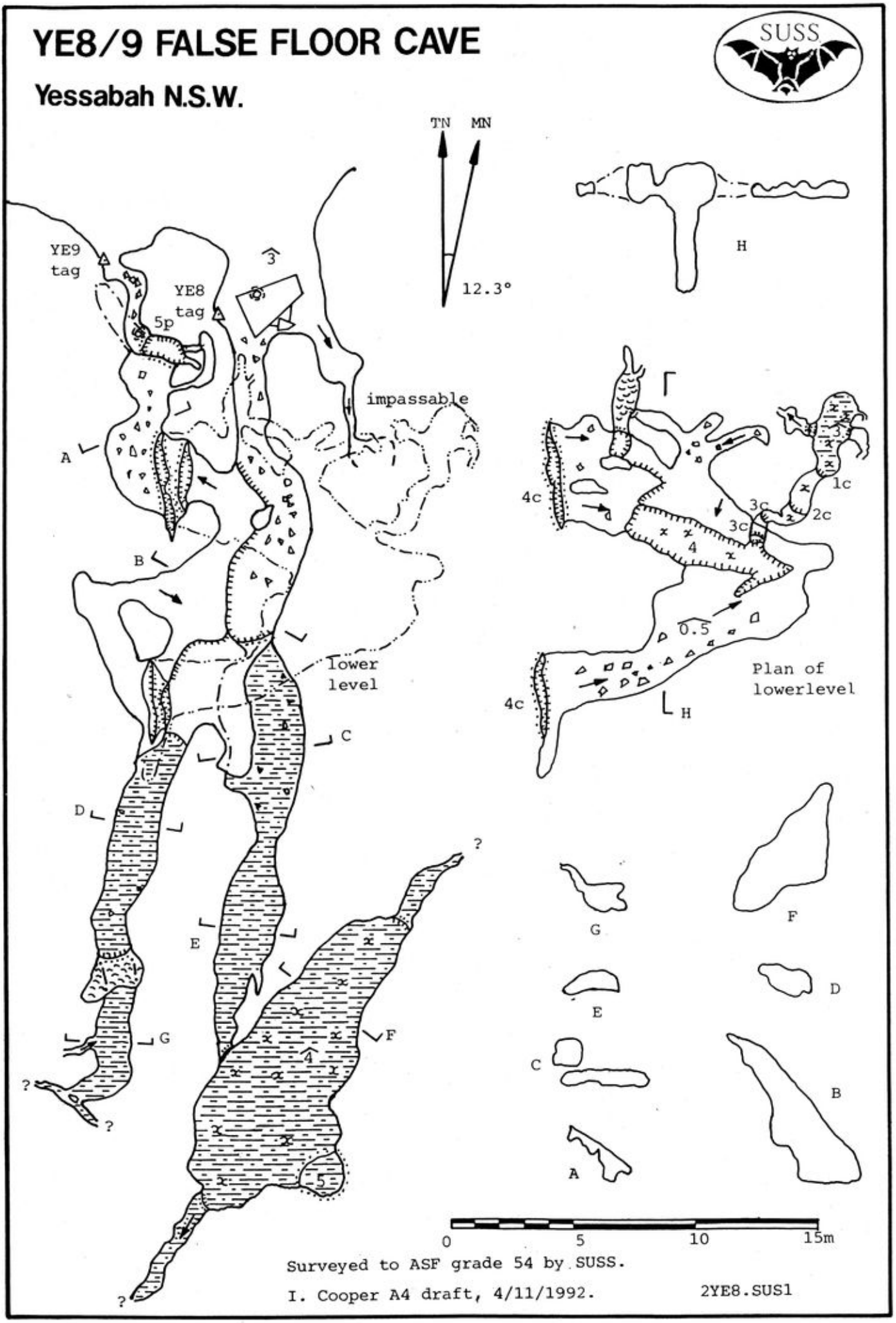
local sausages on a bed of boiled rice.
But this was not before an interesting scientific discovery was made.
We had travelled into Willawarren, the closest town (with a pub). Upon returning we noted an interesting scientific phenomena – the Willawarren factor.
The Willawarren factor can be sumed-up by the formula DRDT = B2ER.
This means that effectively the rate of time is related to how much beer is consumed. (Ie the trip back seemed quicker than the one there).
The reverse of this is also true in that beer goes flat with time.
Extending this principal further we realised that just as beer is preserved by capping in a bottle or can, so can time (air bubbles of past eons) be preserved by capping with ice caps. We are still trying to work out if people can stop time by being capped in a large beer bottle. We already know if you drink too much you die and stop your own time!
We decided more research would need to be undertaken at Willawarren on the next SUSS Kempsey trip.
SATURDAY: After the past few days' searching, and with more local knowledge, we decided we were ready for the big push down Stockyard Creek to look at those "sinks' on the topographic map. Our excitement spread to Dave, who decided to join us for the day.
We set off early, driving down a fire trail to near Stockyard Creek. Another trail then eventually cow trails had us down into the creek. Several kilometres later we could see the mountain that was home to those "sinks'.
Eventually we were at its base. After a quick lunch to recharge our batteries we set up the eastern hills. But nothing could be found – the dry stream bed showed no signs of a sink, but rather carried on down to join the main creek.
Strange we thought, so we tried the other hillside. Again, no signs of sinks, though there were some small landslides at the bottom of one creek that could account for the discrepancy on the map. If the sun was at a certain angle when the air photo was taken that is used to make the map, the drawer could possibly misperceive the creeks as sinking in the forest, rather than carrying on down the slope as they actually do.
There we were, four intrepid explorers a couple of hundred metres up the forested hillside, disillusioned with the Central Mapping Authority.
There was nothing to be done, but be thankful we had not carried all the rope.
We slogged back across the slopes, looking for any trace of limestone – but none was to be found. We were in the midst of granite country!
As the weather was nice and the company good, we continued to scour the hillsides and lantana. Ian and Dave managed to actually find some limestone – some of the most distorted, Ian had even seen. It was on the western bank of Stockyard Creek, about two kilometres downstream of its junction with Rossiters Creek.
Despite the folded, metamorphosed and inconsistent nature of the limestone, Dave and Ian found three caves.
Two were very small holes, while the third was a phreatic tube about 1m high and about 20m long. Ian named this Birthday Surprise Cave in recognition of Major Kaos' birthday that day.
Ian believes there may be a few other caves in this undocumented karst, as the phreatic tube appeared to be a resurgence, just a few metres away from Stockyard Creek.
The limestone continues up the hillside for a few hundred metres. It is uncertain if it continues up the eastern side of the creek.
After eventually trogging back to the car and base camp, we filled our plates with veal tortellini covered with a cream, bacon and mushroom sauce that evening.
SUNDAY: Still not completely disillusioned, we investigated the resurgence behind Lyn and Dave's house.
This resurgence was now completely dry due to the drought.
And after crawling across broken bottles that had been thrown down the cave by the previous farmer, Martin began digging again. (Give the man a bone.)
He eventually managed to break through four squeezes into a narrow rift which was just too tight for him to negotiate. He believed it opened out several metres on.
Eventually we conceded we were beaten and retired to camp where ham and bean Mexican burritos on a curried potato and noddle base was the evening's fare.
MONDAY: Well, we had done our best in the past week to find the Kempsey Karst Crescent's big caves, but had been unable. KSS was not surprised.

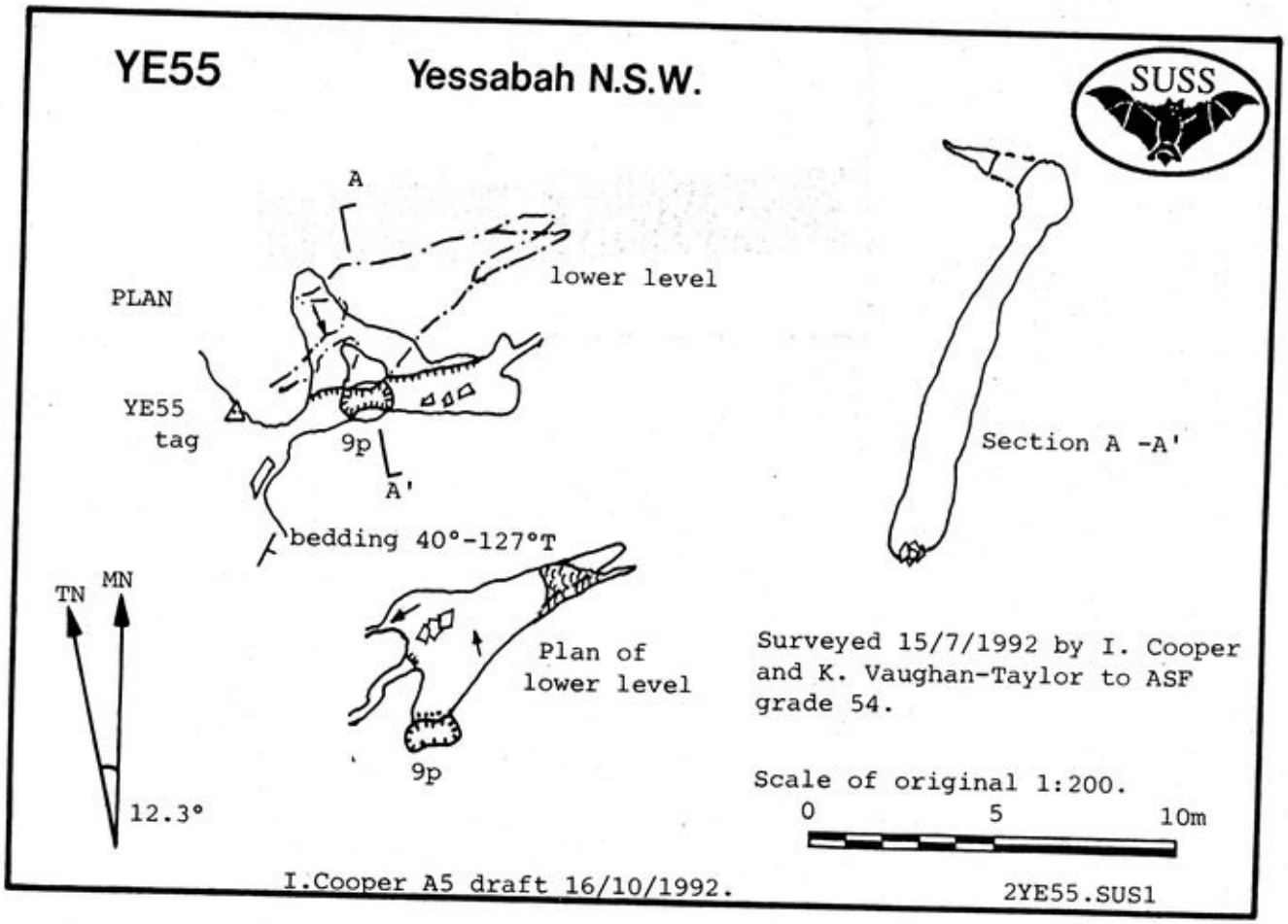
However, we still believe caves remains there to be found next trip. For we did not scour crystal hill or the Queensland Camp region where the main caves are known to be.
There is always next year when it becomes cool enough for us southerners to visit the warm weather of the Kempsey Karst. Accordingly, we packed The Rattler and left the region after an enjoyable week.
In the ensuing week, Ian and Martin visited Barry Caves, near Nundle, where they relocated a cave that has had few visitors since its initial discovery in 1951.
The cave, which is about 100 metres long, was surveyed by the intrepid pair in what is believed to be the first survey of this cavern.
The cave is home to hundreds of horseshoe bats, with one of its most interesting features being a pool of water in the middle.
A search of the karst found no other obvious caves – so they finally journeyed home.
A good time was had by all.



YE8/9 FALSE FLOOR CAVE

Yessabah N.S.W.




YE55
Yessabah N.S.W.
SUSS
A
PLAN
lower level
YE55
tag
9p
A'
bedding 40°-127°T
TN
MN
12.3°
Plan of
lower level
9p
Section A -A'
Surveyed 15/7/1992 by I. Cooper
and K. Vaughan-Taylor to ASF
grade 54.
Scale of original 1:200.
0
5
10m
I.Cooper A5 draft 16/10/1992.
2YE55.SUS1

CONDEMNING EQUIPMENT

CONDEMNING VS. RETIRING

You will notice that we use the term condemn rather than retire. Condemn carries implications of permanent destruction whereas retire involves images of gear being tucked away at the back of the shelf. Condemn is consistent with the wording of the relevant Australian and international standards.

Condemn means that the equipment "shall be rendered unserviceable". It must not be simply thrown away. Rope and webbing should be cut into short lengths (used for knot tying practice?) about 2m long. Karabiners should be placed in a vise and have the gate hammered off. Other hardware should be cut into unusable pieces. Helmets and harnesses should be cut into unusable pieces.

WHEN SHOULD YOU CONDEMN EQUIPMENT?

The simple answer is when you, the instructor, think there is ANY significant doubt about the integrity of the equipment.

As we explained in the last issue, there are no worthwhile, non-destructive tests which can be undertaken at a cost less than the replacement cost of the equipment. Obviously, intelligent inspection of the potential points of failure are important, as is the history of storage and usage. We recommend that you always keep a log of usage of your gear.

GENERAL RULES

Any loading contrary to the design of the equipment, or any loading at the equipment's performance limit, should result in the equipment being condemned. Such events include dropping hardware several metres onto a hard surface, shock loading a static rope, a helmet being hit by an object large enough to knock the wearer to the ground, or where there is any visible damage to an integral part of the equipment.

All good quality equipment is designed to take fairly hard treatment but it is not designed to be abused. You should adopt the approach of assessing equipment BEFORE AND AFTER EVERY USE. By doing this, damage to equipment is usually noticed shortly after it happens.

ROPES

The best way to assess both dynamic and static rope is to measure it when new, wash it, and measure it again. If you record these numbers and measure the rope regularly, you will have a good guide to the safety of the rope. While the rope is shorter than it was when new (and it has not been cut at any stage!) and there is no visible surface damage, then the rope is likely to be safe to use. You should ensure that there are end markers at each end of the rope and it is good practice to write the date the rope was purchased and the length of the rope on both of these.

If, when you measure your rope, you find it 2% longer than it was after you washed it when it was new, then it is time for the rope to be condemned.

You should be reasonably concerned about any sheath damage to dynamic ropes as the sheath carries the load in the event of a fall. If the rope is being used for lead climbing, any serious abrasion (more than one third of the sheath strands) is sufficient to condemn the rope. If the rope is only to be used for top roped climbing the sheath can be abraded until the core shows. The rope should be condemned at this stage.

An example of a dynamic rope which should be, and was, condemned. The sheath fuzz is typical of hard use. The extra long fuzz indicates damage to sheath strands. The visible core is a clear indicator that this rope has reached the end of its usefulness.

The sheath of a static rope is designed to take more abuse than on dynamic ropes. Blue Water static ropes, for instance, are especially designed so that the sheath will "fuzz" after some abrasion and thereby protect the remaining sheath bundles. You should condemn the rope as soon as you can see the core through the sheath.

Reprinted from "Wildspots" Number 3.

SUSS Bull 32 (4): 28

BARRY CAVE
A SUCCESS FOR THE REMOTE AND INACCESSIBLE KARST SUBCOMMITTEE

Ian Cooper

8/10/1992 and 9/10/1992
Present: Ian Cooper and Martin Scott

Once again SUSS set forth in search of new and obscure caving areas. After a fun week at Kempsey then some time at my brother's place, near Tenterfield it was time to head back to Sydney via Barry, (20km north of Glenrock in the southern New England), where Martin and I had heard of there being a cave. Pavey (1972), makes brief reference to the area then referred us to Davey (1968 & 1971), who gives a description of the cave but no location. Davey's description tells of a cave developed on three levels with a stream in the lowermost level! Greatly encouraged we set off to Barry where Sydney University Geology III were holding a field camp.

We arrived mid Thursday afternoon at the camp site by the Barnard River and immediately spotted the limestone at grid reference 4100 0490 (Barry 9134-I-N 1:25000 sheet). The rest of the afternoon was spent prospecting this thin band of limestone which runs southeast for 1km. Alas, no caves, so it was time to consult the geologists to find where the rest of the limestones were. (See area map). We were told of the main body of limestone being located at grid reference 4080 0700. This was the target area for Friday. Further limestone is reported to the northwest of this block, Aitchison, (pers. comm.).

Friday morning started at 5.30a.m., (6.30a.m. excursion time), with the staff sounding motorbike horns to awaken all. The students had been conned into believing that daylight saving had started and thus thought that 5.30a.m. was the more acceptable 6.30a.m. So with such an early start we were dropped off at the limestone at 7a.m. After a little looking around Martin found the cave and we were caving by 7.30a.m.! The exploring, tagging and surveying of BA1, Barry Cave took up the next 5 hours. We then unsuccessfully prospected the rest of the block before returning to Sydney that evening.

Barry Cave is located at grid reference 4077 0695, (Barry 9134-I-N 1:25000 sheet),on Barry Station. Permission must be obtained from the owners before entering the property. The owners may be contacted through:

Mr. Hugh Barnet,
Goonoo Goonoo Pastoral Company,
Tamworth, N.S.W., 2340

The cave is located on the western margin of a 400m long by 100m wide elliptical outcrop of limestone, close to where an unnamed stream meets the limestone. The cave was discovered by Jerry Hide and Bob Evers of Newcastle Technical and University College Speleological Society, (NTUCSS) in 1951, (Davey 1971). The limestone has been known about for a much longer period and was reported by Benson (1918), p.576.

The cave has a vertical fissure entrance and is developed on three main levels, (see cave map). The lowest level contains a south flowing stream with several pools and copious mud. The passage ends in both directions in sumps with shale seen in the northern end. The middle level is a remnant section of vadose, serpentinous passage which passes through two squeezes before ending in an earth and guano filled chamber. The top level is two connected chambers with some flowstone, formation and guano. Overall the cave is 110m long and 13m deep.Both the middle and top levels contain moderate numbers of horseshoe bats with about 300 bats in total. The presence of abundant water and bats suggests that the cave would have a large and varied insect population and requires a visit from an entomologist.

Dominantly the cave is developed along bedding with the entrance rift, stream passage, and upper level all orientated parallel to strike. Scalloping in the middle level shows that this area was formed by an east flowing stream. It is probable that the middle level is a remnant from a time when the stream just outside the entrance flowed through the cave. The survey shows the outside stream to be 5m above the upstream sump and the two are almost certainly connected. There is no obvious sinking point in the surface stream nor an obvious resurgence which presents the possibility of the streamway being a pheatic backwater.

REFERENCES

BENSON, W.N., (1918) "Geology and Petrology of the Great Serpentine Belt" Proceedings, Linnean Society of N.S.W. 43, p. 593.

DAVEY, D. and JENNER, P., (1968) "New England Tablelands" University of New England Mountaineering Club.

DAVEY, D., (Ed.), (1971) "New England Tablelands" University of New England Mountaineering Club.

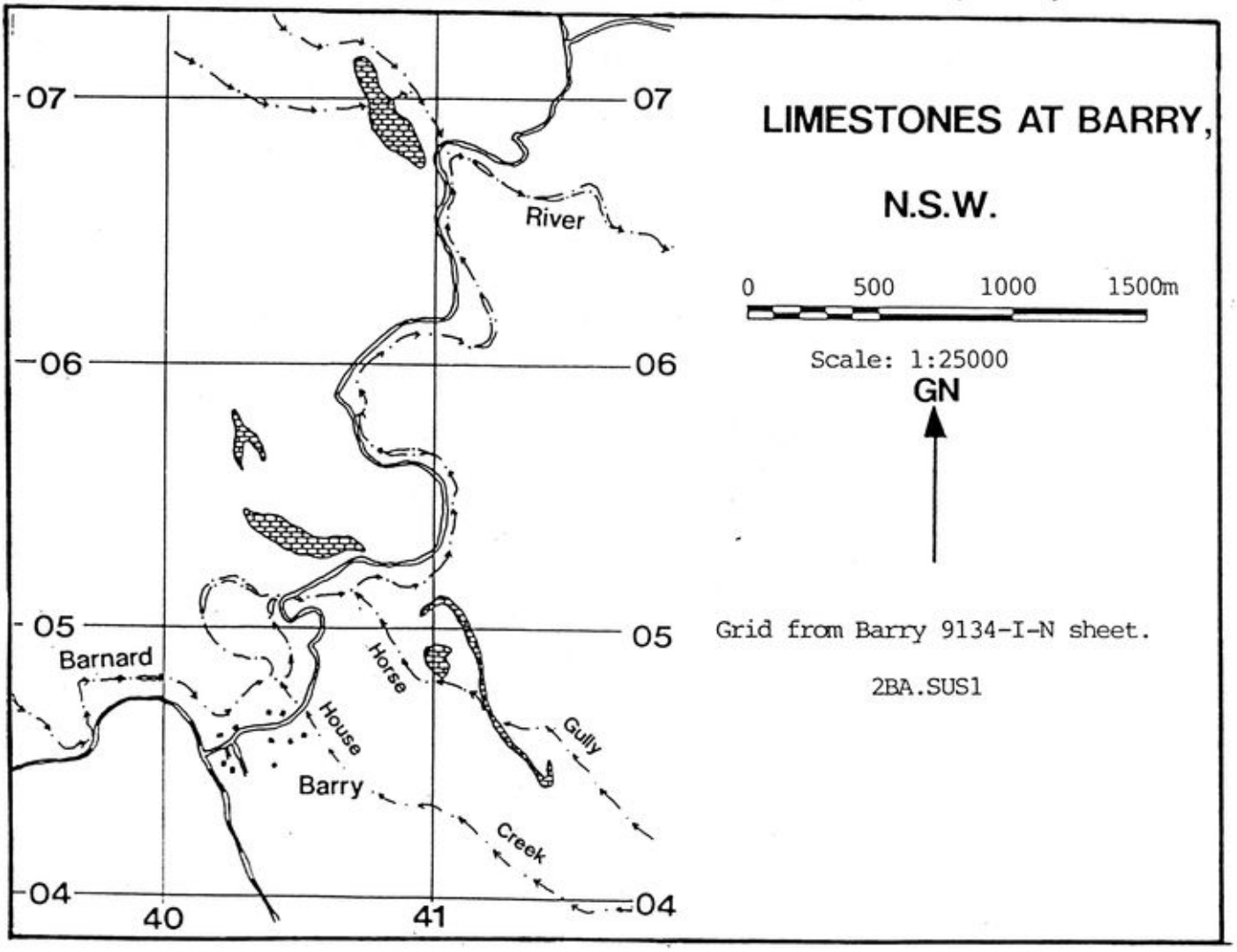
PAVEY, A., (1972) "An Index to Cave Maps in N.S.W." Australian Speleological Federation, Sydney.

BARRY CAVE SURVEY DATA

Surveyed 9/10/1992 by Ian Cooper and Martin Scott using Suunto-Oy KB20/360R compass, PM5/360PC clinometer and Toolmac 30m fibreglass tape to ASF grade 54.

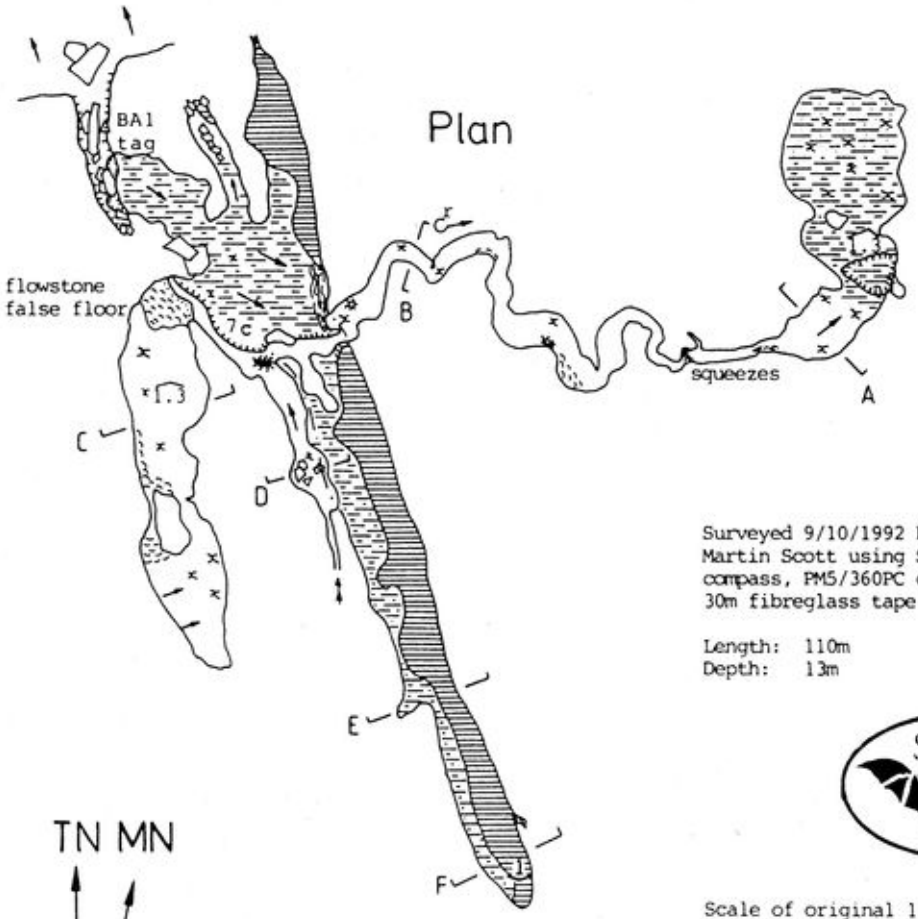
STATION & COMMENTS	TAPE(m)	COMPASS	CLINO.	LEFT	RIGHT	UP	DOWN
BA1 entrance tag				--------- Station on surface ---------			
	20.15	342	-14				
1 1.2m above surface stream				--------- Station on surface ---------			
	-------	-------	-------				
BA1 entrance tag				0	1	1	1.3
	2.59	173	-15.5				
2 Right wall in entrance				0.7/3	0/1.4	2/0.8	2/0
	6.70	092	-51				
3 Pencil cross on left wall				0/1	4/2.2	2/2	1/1.3
	6.73	119	8				
4 Right wall at start of middle level				1/1.1	0.3/0.2	2/2	5/2
	4.01	018	14				
5				0.5/0	0/0.7	1.5/1.4	0.5/1
	1.57	100	-3.5				
6 Blade on inside corner of meander				0/0	0.5/0.7	1.5/1.5	0.7/0.7
	2.69	056	2				
7 Knob on left wall				0.5/0.3	0.5/0.5	1.5/1.2	0.6/0.6
	2.60	163	-6.5				
8				0.7/1	0.3/1	1.5/1.5	0.3/0.3
	4.31	109	9				
9				0/0.2	1/0.6	1/1	0.8/0.8
	2.58	015	-1.5				
10				0.5/0	0/0.5	1/1	0.6/0.7
	1.28	108	8				
11				0/0	0.4/0.4	1/1	0.7/0.7
	1.21	187	2				
12				0.4/0.5	0/0	1/1	0.6/0.6
	0.83	089	-7				
13				0.2/0	0.3/0.7	0.5/1.2	0.5/0.5
	3.23	072	2.5				
14				0.5/0.5	0/0	1/1	0.5/0.5
	2.82	056	-18				
15 On roof				1/1	1.5/1.5	0.2/0	0.5/0.4
	2.10	026	-21				
16 Prominent projection on left side of muddy chamber				0.5/0.5	1.3/1.3	0.3/0.3	2/2
	6.20	355	-2.5				
17				3	1	0	0.5

STATION & COMMENTS	TAPE(m)	COMPASS	CLINO.	LEFT	RIGHT	UP	DOWN
4 Right wall at start of middle level				0	1	2	5
18 Stalactite	3.11	253	33.5	1/0.5	1/1	0.5/0.5	1/1.5
19 Tip of flowstone shawl	3.52	286	16.5	2/2	1/1	3/0.5	8/0.5
20 On roof	2.94	203	12.5	1.4/1.4	1.7/1.7	0/0.5	0.5/0.5
21 Bump on column on left side of squeeze	5.24	150	15	0/0	0.5/0.5	0.3/0.3	0.5/0.5
22 Stalactite at end of room	5.11	157	1	0.5	1	0.5	0.5
	---	---	---				
19 Tip of flowstone shawl				1	4	3	8
23	3.80	122	12	1/1	0.5/0	1/1	0.7/0
24	4.34	134	46	0/0	1/1	1/0.5	0.5/1
25 Small stalactite	2.67	150	19	0.5	0.5	0	1
	---	---	---				
3 Pencil cross on left wall				0	2	1.5	1
26	5.89	130	-22.5	3/2.5	1.5/2	0/0	1/1
27 Projection on right wall	7.61	150	-4	3/2.5	0.5/0.5	0.3/0.3	0.5/0.5
28 Projection on right wall	6.83	143	-2	1/1	1/0	0.5/0.5	1/1
29 Stalactite on roof, 0.27m above pool	6.44	143	-1.5	1	1	0	1



BA1 BARRY CAVE

BARRY N.S.W.



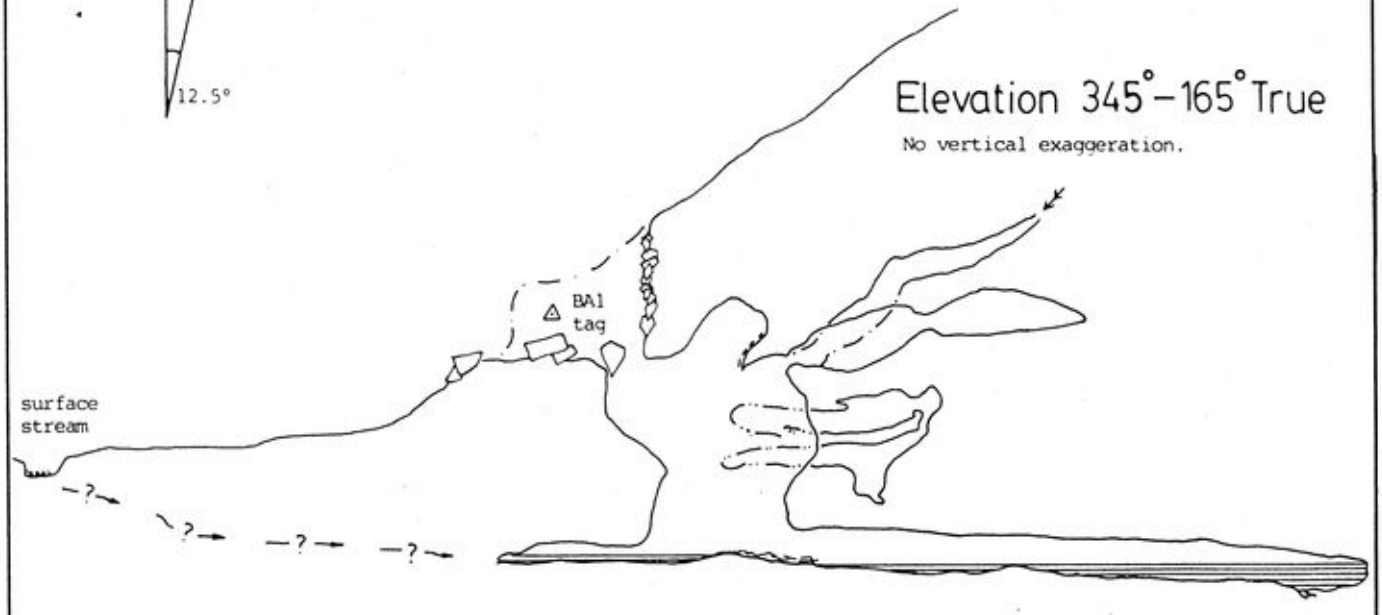
Surveyed 9/10/1992 by Ian Cooper and Martin Scott using Suunto-Oy KB20/360R compass, PM5/360PC clinometer and Toolmac 30m fibreglass tape to ASF grade 54.

Length: 110m
Depth: 13m

SUSS

Scale of original 1:200

0 5 10 20m



I. Cooper A3 draft 21/10/1992

2BA1.SUS1

ACCIDENT REPORT

Date: October 1, 1992

Locality: Holme Common Room, University of Sydney

Accident type: Caver fall

Details: A large party of over twenty cavers had entered this cave with the intent of holding a meeting. A small party of four broke away from the main group and proceeded to one end of the main chamber, where they proceeded to take photographs. The party comprised Pat Larkin, Hilary O'Byrne, Mark Staraj (SUSS) & Gnomemore, a visiting WASG caver.

Larkin, as photographer, was encouraging the others to pose for photographs in increasingly precarious poses, one of which involved Gnomemore balancing on top of a chair occupied by Staraj. Unfortunately, (but, perhaps, inevitably), when Staraj moved after the photo had been taken Gnomemore was dislodged from his precarious position and sustained a 1.5m fall onto the wooden floor below. Due to the victim's extremely fragile constitution, this was sufficient to ensure that Gnomemore was no more.

Analysis: Two elements stand out as being prime contributors to this incident. Firstly, Larkin, Staraj and the victim had been observed shortly before entering the cave at the local public house, consuming alcoholic beverages. Cavers are by nature more partial than most to the 'demon drink'; however, the partaking of alcohol before caving is an extremely dangerous practice and to be discouraged at all times.

Alcohol was no doubt the factor that encouraged Larkin to pose his subjects in more and more dangerous and precarious positions in the search for the 'perfect shot'. The three SUSS members, all with extensive Australian and overseas experience, should have known better than to let their novice companion indulge in such foolish shenanigans. If there is a lesson to be learnt here, it is that the humble camera, usually thought of as one of the safest pieces of a caver's equipment, can be lethal when in the wrong hands.

Sympathies are extended to the victim's relatives and friends in Western Australia. It is understood that the body will be privately interred.

<<< PAGODA::DUB19:[NOTES$LIBRARY]SPELUNKING.NOTE;2 >>>
-< SPELUNKING >-

Note 119.1 Are mines less safe than caves? 1 of
SCOAYR::JDRAKE "Jeremy Drake 823 3155" 57 lines 20-JAN-1992 05:
-< Yes they are more dangerous, but not suicidal. >-

I did a long answer to .0, but the network partner exited and it dissapeared into the void. Here is a second attempt.

When I was living in the south West of England, I used to visit old Tin and Copper mines, in addtion to going caving. On balance I'd say that the mineing was much more dangerous than caving. There are relatively few accident in mines, but this may be due to the fact that fewer people visit them and they are more experienced. For Joe Public both mines and caves are dangerous. For an experienced caver both can be visited relatively safely, but mines require much more prudence.

As regards stability. Caves are formed over thousands of years by relatively gentle erosion processes. Most things that are likely to collapse will have already done so. The most common danger are boulder chokes, where the roof of a chamber has collapsed and the boulders are left, possibly being eroded away at the base by water. Mines on the other hand are made over only a couple of years, using large amounts of explosives. The explosions can shatter the rock in the walls and roofs to a great depth. This shattered rock, along with waste rock boulders is then held up with wood. Most UK metal mines will have been abandoned for at least fifty years. The wood shoring had a short design life and will have had no maintainance since closure. The wood is sometimes so rotten that you can stick your thumb right into it. I would not trust any wood down a mine. Certainly not as a belay for vertical sections. I would not touch any that was holding anything up. Even then you cannot be certain. Sometimes you can be walking on what seems to be solid floor, only to find it is wood covered with mud, over a long drop! I have returned to a mine and found it different from the first visit. Fortunately a mine has not collapsed while I have been in it, but some close squeeks have happened to friends. There have been plenty of passages in mines that have looked too dangerous to go down. This is very rare in caves.

Radiation can be a problem in both mines and caves. Radon gas can collect in poorly ventialted areas. In Cornish mines it is a particular probl as the mines are through granite, which contains a good amount of uranium. On of the decay products is Radon. Radiation levels in some mines and caves have been measured at levels that would give you a yearly reccomended maximum dose in a few hours.

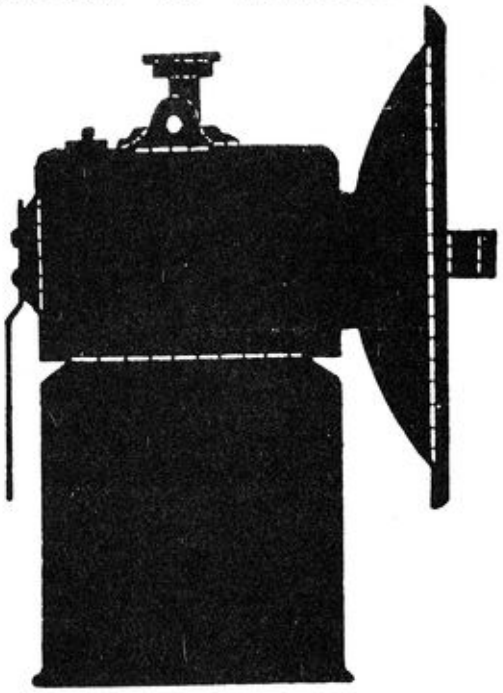
Descending vertical shafts in mines is a problem. At the surface the shaft will pass through unstable soil. The soil is often only held back by a stone wall founded on rotten wood beams. Underground wood cannot be trusted and the rock is often shattered. Often you must take down wood beams and scaffold bars. In one often visited mine I know of the explorers have drilled expansion bolts three feet into the rock to reach sound rock over pitches.

Personally I find mines a bit depressing. I much prefer natural cave. If there are decent caves available I'll go down them in preference. Some people like the industrial archeology and the geology of the places. Mines are usually visited for a purpose. For example to survey a section, discover a previously unvisited section, take photo's or whatever. Sporting trips are relatively rare.

So mine exploration isn't the suicidal exploit the notices at the entrances suggest, but you must know what your about and the risks are higher than for caves.

JD

Lumen in Tenebris



SUSS

BULLETIN
of the
SYDNEY UNIVERSITY
SPELEOLOGICAL SOCIETY

BOX 35, HOLME BUILDING,
UNIVERSITY OF SYDNEY,
N.S.W. 2006

THIS ISSUE: