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JOURNAL COMMITTEE - R DYKES, E.CRABB, G.HOPKINS.

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INTRODUCTION

Publication of speleological activity appears to be the Achilles heel of caving/speleological clubs, and in the past, H.C.G. has fared no better or worse than many other societies. However, this journal, a product of the re-structuring of H.C.G., is a serious attempt to remedy previous shortcomings.

To appreciate the role of the journal, an understanding of the "modus operandi" of the club is needed. In most societies, field activity is of a largely social/sporting nature, with a few naturally evolved leaders following a deeper interest in some of the many disciplines involved in speleology. In some cases, club committees nominate qualified leaders for committee organised trips; otherwise, qualified leaders nominate trips which are then open to club members. This procedure then necessitates the framing of rules and regulations, covering reams of paper; ultimately a disproportionate amount of time is spent on legislation, enforcing, condemning, appealing, reporting; amusement is provided by tales of wipe-outs on the road, who drank more than who, attitudes of superiority over the common herd. Many speleo publications carry far too much reportage of activity of this nature.

In our case (but yes, we do occasionally wipe out, or get sloshed) the restructuring is based on the club being the communication medium between people of proven competence in safety and ethics, each of whom is utterly bored with simply visiting caves, and is actively engaged in some work of their own interest. Support for the individual comes through the inter-communication within the club. Hence there are few club trip reports as such, the observations and efforts being recorded instead in the form of field notes held by the individual. When a project, or a phase of work, is complete, then the results are prepared for publication; this journal, then, is the formal publication of the work undertaken by members of the Highland Caving Group.

I thank the contributors for their support, the members for their objective approach to our problems, and my caving associates for their assistance.

EVALT CRABB

President

BUNGONIA

PRELIMINARY NOTES ON SPELEO-GENESIS

E. CRABB

The volume of published work on the geomorphology and hydrology of the Bungonia Plateau by many eminent workers makes presentation of a different though occasionally supportive, line of thought rather difficult. This is so because a postulation cannot be demonstrated by application of effort and the passing of time as in many other disciplines; instead, we can only construct a model and subject it to whatever sympathetic or contrary evidence is subsequently exposed. The only exception to this is short time span or cycle (i.e. upto a duration of two generations of man) prognosis.

On this basis, the following discussion on the Bungonia Plateau should be regarded purely as of a speculative nature. As such, a large volume of field observations of a major qualifying nature have been omitted for the sake of brevity at this time; the purpose of this preliminary discussion is simply to communicate with others interested in the same field and to provoke comment, criticism and valued competition. Accordingly, no apology is made for grouping several unrelated aspects into the one article.

1. Rejuvenation - Stream Courses.

Most published work on cave genesis at Bungonia presupposes the stream channels in the area have remained constant in their course, the only change being incision and subsequent slope processes. However, it is possible that the relief has varied considerably due to erosional forces, the amount of reduction being a major unknown factor.

It is now suggested that a varying course of Bungonia Creek is the dominant factor in cave and gully development, with a proposal that its original course, after junction with Ryan Creek, was easterly toward the Shoalhaven River, via the present day Beck's Gully. Subsequently, the course changed to a bearing of approx. 35°, i.e., more or less over the site of the present road and toward the lower interface of the lower limestone.

The next change in course was again a more westerly course, this time in the region of the lower interface of the upper limestone, except possibly an intermediate diversion from present Cowpool area, over B31, B14 etc. This third course, as proposed, would have been over B35, B24, & B57, to join Jerrara Creek where it swings to an easterly direction. The final diversion was to its present course, joining Jerrara Creek farther upstream, near the present junction.

The main evidence of the first course is in the continuation of the greatly reduced broad valley, best discerned from an aerial viewpoint with oblique lighting. The valley downstream from the bluff at Beck's Gully, subject to incision due to rejuvenation with subsequent slope processes, suggests a stream volume at least equal to that of Jerrara Creek, i.e., far greater than present catchment areas involved in the incision.

It has been considered that there may have been simultaneously surface stream, rising on the ridge south of the Lookdown location, and flowing in a southerly direction over the location of B70 & B130 to join the main creek below the Beck's Gully bluff; alternately, a stream rising near the Lookdown and running roughly along the lower interface of the lower limestone, similarly passing over the B70 location. This comment is purely speculative, and at this time it would appear that a great deal of work need be done to produce substantive evidence.

If any cave development occurred in this initial phase, it is considered that little, if any, remnant has survived the surface reduction, with the possible exception of the peculiar landform in the Corncob Cave area. It is believed, however, that this area, the upstream stream captures and the downstream evidence of outflow caves in the bluff are products of much later vadose action.

Postulation on the deviation of the Bungonia Creek to follow the lower interface of the lower limestone is perhaps the most vulnerable aspect of the total concept. This proposal is based on two major features - the valley structure between Troy Walls and Mt. Ayre, and the proposal of phreatic or quasi-phreatic initial development of the higher levels of the major caves B44, B13, B15, B5 & B4.

Although current attitudes regarding variations in valley slopes along the course of Bungonia Creek follow a logical pattern, it is felt that the broad extent of Troy Walls and its adjacent valley does not easily conform. The factors of incision and wall breakdown applied to Bungonia Canyon must apply equally to Troy Walls, provided there is sufficient stream action. At the upstream end of the deviation there is evidence of a reasonable depth of detritic and humic sedimentation, greater than apparent on the surrounding area.

A phreatic stage of cave development has been propounded, but it is considered that this has been over-simplified, particularly by Pratt (1964). The weakness of this phreatic theory lies in the self imposed limitation on depth, with application mainly in the horizontal components. If we extend our thinking in line with W.M.Davis (1930) and H.Bretz (1942), and accept a far greater depth of phreatic action, perhaps to 70M. below the surface, then the initial development of the older, more voluminous caves at Bungonia can be explained. In particular, this would apply to B44, B13, & B4-5, with the suggestion that other horizontal components, eg. B31, B50, B43 were the result of tributory channels.

Briefly, it is proposed that solution occurred along bedding, jointing and interface below a slow stream, with resurgence occurring at or near a rejuvenation head. Mass reduction would then account for disappearance of a shallow resurgence channel, and a later development of collapse dolines near or at the junction of tributaries. These tributaries would appear to have become feeder stream channels to a later stage of development.

There is ample evidence of solution tunnels remaining in the higher levels of the caves mentioned, together with associated features, such as roof domes, etc, but later vadose action and breakdown has caused considerable modification. A surviving surface remnant of this phase is at the entrance to Mendip Cave (unnumbered), approx. 60M. east of B13. In all cases, evidence of solution effect appears to cease at the -70M. level, with usually significant change of cave structure below this level.

The subsequent deviation of Bungonia Creek to follow the strike of the Upper Limestone is more discernible, and important to this observation of the dip in the Adam's Lookout road, directly between B34 & B24.

It is easy to visualise Bungonia Creek flowing along the strike, continuing to the course of Breton's Creek. The suggestion then is of receding stream capture, the first stage of which could have been near the Efflux B67. Subsequent modification from this point, logically would have extended to final collapse into open valley, with the next point of capture responsible for formation of Mass Cave B25 and Chalk Cave B26, apparently the oldest surviving caves near this stream course. Recession of stream capture then occured via B24, B34, B84, B74, B71-2 through to B102. Tributaries to this stream have indications of individual recession of capture, as indicated by B39, B32, B36 & B35.

With the exception of B24, these caves exhibit similar characteristics- a constricted entrance in the floor at the base of a cross-valley face followed by a pitch, stream worn but modified by block collapse. At the base of the pitch there is usually a plunge pool (usually filled with detritic sediment), followed by a stream passage descending at a shallow decline, with the well formed stream passage ultimately blocked with silt.

Excavation at chosen capture points have revealed Pants in Tail Cave B39, Solar, Orpheus and Stevie's Wonder Caves (un-numbered). These exhibit the same characteristics. Unfortunately, refuse is currently being dumped in many of these cave entrances, making further investigation either unpleasant, difficult or impossible.

At the time of initial exploration of College Cave (B84), it was reported that sedimentary samples collected between -30M. & -50M. proved to be of the same origin as an outcrop approx. 3KM. upstream along Bungonia Creek, with no matching evidence in the intermediate space (pers. comm. Burton 1970). Verification of this expansion of the investigation has not been advised.

In the same area, ie, from the boundary of the Caves Reserve to approx. 2KM. south, several perched entrances have been found (subsequently filled with garbage), which were at first considered to be part of the effect of this latter course of Bungonia Creek, but now considered as possible remnants of a stage of cave development preceding all of those outlined. This stage of investigation is in it's infancy.

Hydrology of Grille Cave B44

Observations of water flow patterns in the Grille Cave have been made over a number of years commencing in 1958, and covering all conditions from drought to flash flooding. From this, a number of conclusions and comments have been drawn.

Although a catchment area of approx. 22Ha. has been proposed (Counsell 1970), it is believed that approx. 9Ha. is more realistic. This is so because of stream capture of every feeder stream on the western segment of the strike line on which the cave is located. The residual area, downstream of capture, is in the order of 1Ha.

In all five capture points have been located, the most significant cave-wise being the Phoenix Cave (see description this issue). Structurally all five stream captures lie along a common strike plane, which extends to encompass B11. This system, over 100M. deep and over 300M. in length, lies parallel to, and 150M. west of the Grille Cave. The northernmost entrance, B58, was until a few years ago capped with clay and detritus, permitting run-off over the top. It is suggested that following a minor drought period (mid 1960's) the fill material dried out considerably, facilitating collapse due to lack of cohesion. Excavation was undertaken in early 1975, when the floor was 1M. below the surface, the cave now being accessible to a depth of 13M.

It is believed that progressive capture of these streams has in turn affected the stream pattern and structure in the high levels of the Grille Cave. There is a seldom visited passage, accessible near the base of the long ladder, running upward underneath the main passage, terminating in rock pile a few metres north of the Daylight hole. Contact through rockpile at the side of the main Passage has been proven. There is remnant evidence of solution and pressure tube development. Hydrologically, this passage has been abandoned, except for some seepage, and is in a state of decline, with roof and wall collapse occurring.

The proposal is that this passage was the earliest vadose passage in this level of the cave, changing direction to bedding orientation near the short ladder below the main long ladder.

As the western streams were progressively captured a higher proportion of water input came from the south, so the inlet formed the present daylight hole, with a more recent capture through narrow fissures in the gully up to 10M. south of the daylight hole, and now entering the cave at the side of the chamber below the daylight hole. It would appear logical that the major cave enlargement leading to block breakdown occurred during the middle phase.

Below this level, observation of the cave under flood conditions may have some significance. During periods of heavy downpour, the area between the horizontal ladder and the top of the mud slope has been seen to be filled with water to within approx. 1½M. below the flat floor at the top of the mud slope. Despite this, it has been possible to negotiate the cave right to the right hand sump (until survey, this was believed to be lower than the left hand sump) and return, the only evidence of water flow being a trickle at the 8' climb in the stream passage. On one occasion, in the 50 minutes intervening before return to the top of the mud slope, an estimated 80,000 cubic feet of water had drained away, leaving that section of cave completely negotiable. With an observed periodic filling and subsequent scouring of humic fill around the bottom of the mud slope, this has led to the postulation of a substantial stream passage yet to be excavated.

At the same time, detection of a reasonably persistent drought, from Bat Chamber to Crystal Palace, at roof level and with an average velocity of 4M./minute, together with observable roof structure at the Bat Chamber, has led to the postulation of the existence of a higher abandoned passage, possibly chronologically related to the original top level stream passage. Unfortunately, higher priority work has precluded further investigation. Lower in the cave, beyond the junction, work is proceeding on investigation of a higher level passage when foul air permits.

NOTE: Since the above was written, the cave referred to as "Stevie's Wonder" is being identified as "Bunny Room" (see description). Also, survey has proven depth and length of Phoenix Cave as being 80M. deep, with 250M. passage length

WHY A B4-5 EXTENSION?

S. BUNTON

PROLOGUE.

If the B4 - B5 extension is viewed as an underground stream passage rising below the entrance of B4 or B5, then for all intents and purposes it flows in the opposite direction to that which may have been predicted. The fact that it flows south could be accounted for by the source of water entering the cave having come from a point north of the present entrances. The puzzling fact, however, is why it so meticulously follows the strike with very little down the dip or cross-bedding westward trends towards the efflux; why do the caves converge on B11.

DATA.

There exists a ridge in the limestone just east of the Bungonia Lookdown Road tending north from opposite Adams Lookout turnoff, to Troy Walls. Along this ridge there are no dolines or notable cave entrances. The only evidence of solution of this ridge occurs west of B5, where the limestone has exposed potholes 1 metre in diameter by 1 - 2 metres deep, formed with round smooth sides.

The cliff above B5 stands exposed to the forces of weathering, yet appears to have undergone little solution.

Such a ridge has concentrated surface drainage to flow into nearby holes and increase solution in these such caves on the eastern side of the ridge being B:4, 5, 19, 15, 21, 41, 119, 120, 121 and those on the west B:7, 14, 53, 56 and 43. The only breakdown at this ridge is evident in B:6, 119, 120, 121, is mass wasting where the limestone in the ridge is carved into boulders causing unstable situations in B6 and the B114, 120, 121 doline. Also in this doline in B95 whose west wall like B6 is bedrock and the east wall is boulders. This ridge closely follows the strike of the lower limestone.

LIMESTONE SUB-STRATA.

A possible explanation of the above observed phenomenon is that a section of the lower limestone bed is less prone to solution than the rest of that bed. The peculiar characteristics of this layer must have been inherent in deposi-

tion of the bed since it is a specific layer in the bed which shows this tendency. That meaning metamorphism etc. has not caused the change in the properties of the limestone.

THE SOUTHERN EXTREMITY.

The collapse around B11 cannot be taken as evidence that this is the point where the insoluble layer ends. B11 was reported filled by the Mines Department last century and as such is not in its natural state. The evidence for it terminating somewhere in the vicinity of B11 is given by interpretation of phenomena further south. South of B11 no ridge exists and water drains from the shale band ridge (near the old cottage) west to the Grill Cave. Water flowing across the road is evidence of this.

It seems likely that the key to Bungonia exists not in connecting surface caves to the B4 - 5 extension, but in determining the extent of solution south of B11 and west of Grill Cave. The effect of the absence of the insoluble rock in this region is hard to determine.

EXTRAPOLATING TO UNDERGROUND SITUATIONS.

If the above postulation is true then such properties of that layer could be present underground. This would mean that water entering the limestone on the east of the insoluble layer could not drain to the efflux through that layer but would have to go around it. The B4 - 5 extension expresses that tendency but that is not all:- Other caves south-east of the layer must make a slight detour around the end of this layer.

It does however allow the Grill Cave doline to expand in all directions whereas the B4 - 5 dolines can only expand eastwards.

This being the case the B 4 - 5 extension may rely on water intake from other dolines whereas Grill Cave need not depend on other infiltration.

QUESTION

If Grill had extra flow from the surface above its length, could we have had a 3000 foot long Grill Cave. In which case limestone Substrata need not be the answer.

CAVE DESCRIPTION -"BUNNY ROOM"(not numbered)

S. BUNTON

Entrance to the cave is via a solution tube which is perpendicular to the rest of the cave. This tube enters a rockfall chamber of small dimensions. This rockfall blocks the upstream passage in the pressure tube.

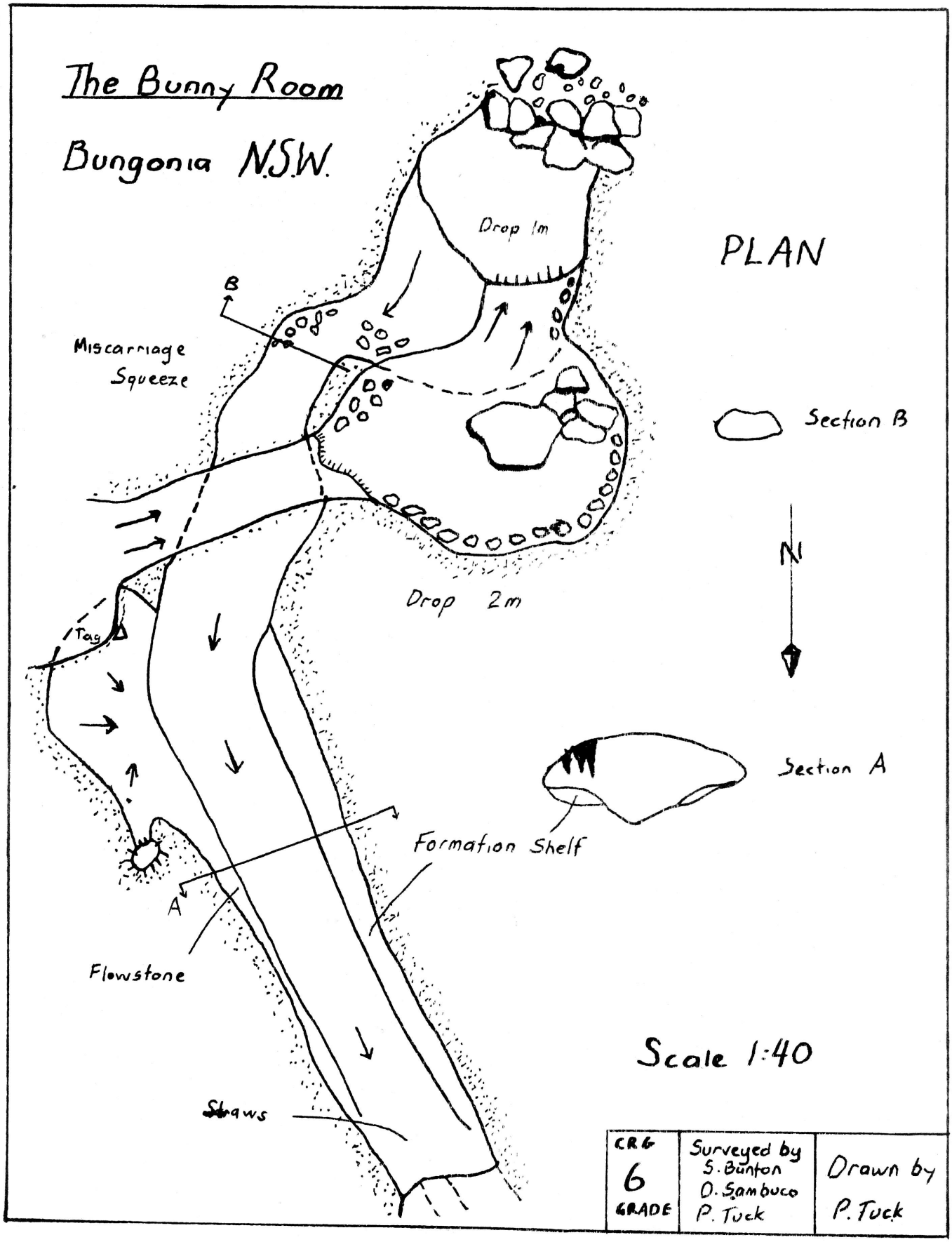
This cave is approximately 75 - 90 m long and about 18 - 25 m deep. Throughout its entire length it follows the strike and the dip meticulously. It has a characteristic oblique eliptical shaped cross-section, dimensions 1.3 m x .6 m. The cave consists of 4 or 5 sections, each sausage shape due to constriction at the ends. These constrictions are almost squeezes, each squeeze dropping into a floor canyon in the next section.

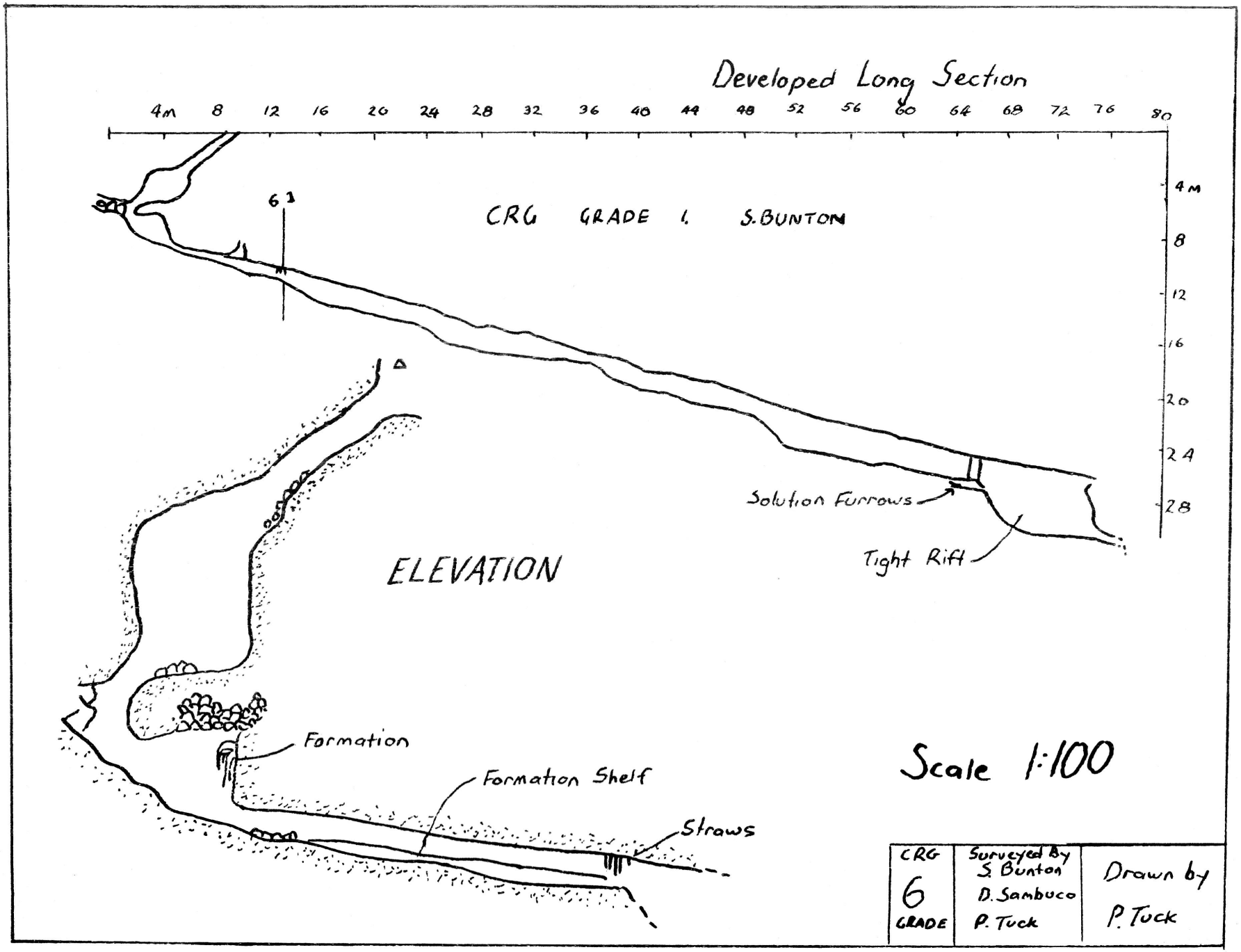
I can offer no explanation of this successive closing down and opening up of passage, since the whole cave appears so uniform as one complete pressure tube.

The cave terminates in a tight almost vertical rift in a dip joint. The rift is lipped by solution furrows, similar to "Dragons Teeth" B16 - 51.

It appears that 'Bunny Room' was not developing for a long period in time. It has now reached its ultimate in size except for possible deepening of floor canyons. No longer does it take vast quantities of surface drainage. All water which enters the cave is now depositing calcite formations on the upper side of the passage.

The cave was excavated from the surface by S. Bunton, P. Tuck and D. Sambuco on 31/5/75. It was then surveyed C.R.G. Grade 6 from entrance to the straw choke from there, grade 1 the following day.


The Bunny Room
Bungonia N.S.W.
PLAN
Drop 1m
B
Miscarriage Squeeze
Section B
N
Drop 2m
Tag
Section A
Formation Shelf
A
Flowstone
Scale 1:40
Shaws
CRG 6 GRADE
Surveyed by S. Bunton O. Sambuco P. Tuck
Drawn by P. Tuck


Developed Long Section
4m 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 72 76 80
4m
8
12
16
20
24
28
61
CRG GRADE 1. S. BUNTON
Solution Furrows
Tight Rift
ELEVATION
Formation
Formation Shelf
Straws
Scale 1:100
CRG
6
GRADE
Surveyed By
S. Bunton
D. Sambuco
P. Tuck
Drawn by
P. Tuck

MENDIP CAVE (not numbered)

J. HOPKINS

Prologue.

It was decided to dig in this rock doline in the Drum area as it was realised a large amount of water drained into this doline particularly during flood condition.
It was postulated that water must have flowed in the opposite direction than it does now as the doline was originally solutioned from the other side to allow to pass under the arch and thereby into Mendip chamber.
This, coupled with the fact the 'transcribed to the surface' map appearing in the Bungonia Book showed the Drum Cave system as nowhere near the Mendip Cave led us to excavate.

It was with great surprise that when the cave was opened it was found to be populated with a bat colony, in such close vicinity to a known maternity cave; it was later discovered to be a part of the Drum System leading into the Cess Pit.

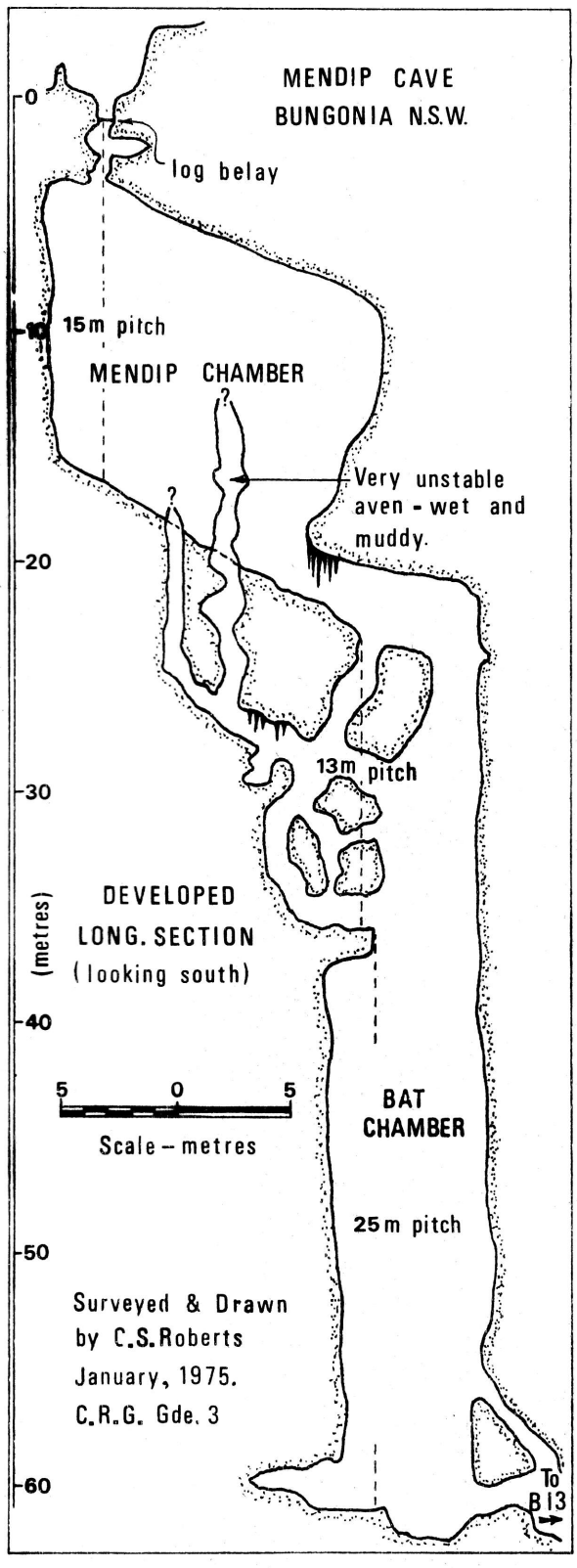
On discovery, an abortive attempt was made to contact a bat researcher, and as this was the conclusion of the Bat breeding season, closing was deferred to August '75 in time for the next season.

Later information stated the temperature was dropping to such a degree as to be danger to the bats and the cave was closed by U.N.S.W.S.S. in May 1975.

Description.

Mendip Cave is situated in a small rock doline about 65 M east of Drum entrance. The entrance consisted of a squeeze though rockpile, which opens into the top of an oval chamber, a 15M pitch. The floor is rockpile, thickly carpeted with guano, sloping to an unstable, wet ,muddy aven leading to a 13 M pitch; a 25 M pitch leads into Cess Pit.

Excavated by members of H.C.G.
December 1974 - January 1975.



PHOENIX CAVE B60

(First reported "ARAGONITE" 2:4)

GRAEME SMITH

Depth (Surveyed so far = 39M)
estimate at 70M

Length (Surveyed so far = 145M)
estimate at 250M

Excava tion was started 12/4/74 by Evalt Crabb, Gerry Hopkins and Geoff Jonas. It was completed the following weekend by Gerry Hopkins and Geoff Jonas at 4.00 p.m. on the Saturday.

The cave is entered via a squeeze in a small doline in the Grille catchment area. This opens out into a rift about 1M wide which descends about 4M, to a low stream passage with a soil floor. This opens out into a small chamber (with a domed roof) then turns southwest down a bedding plane passage until a small chamber is reached which forms a small loop in the passage. The passage then quickly descends under itself in an easterly direction, still in bedding plane type passage with a clean fluted floor. A small floor canyon appears and drops away just before a 3M climb. At the base of this climb a bedding plane about 8M high is entered and this develops into a stream passage tending north. The stream passage enters the top of a N/S rift which is easier climbed by traversing along the top before descending 4M to the stream passage again. Some formation is found in the roof here, as with most of the cave fossils are abundant. The stream passage descends to the west and widens out to a bedding plane, then narrows and finally "the squeeze" is entered at floor level.

The squeeze is about 15M long and is tight near the start. The movement of cavers through this squeeze has made it considerably larger allowing the more agile to get through without removing battery pack and helmet.

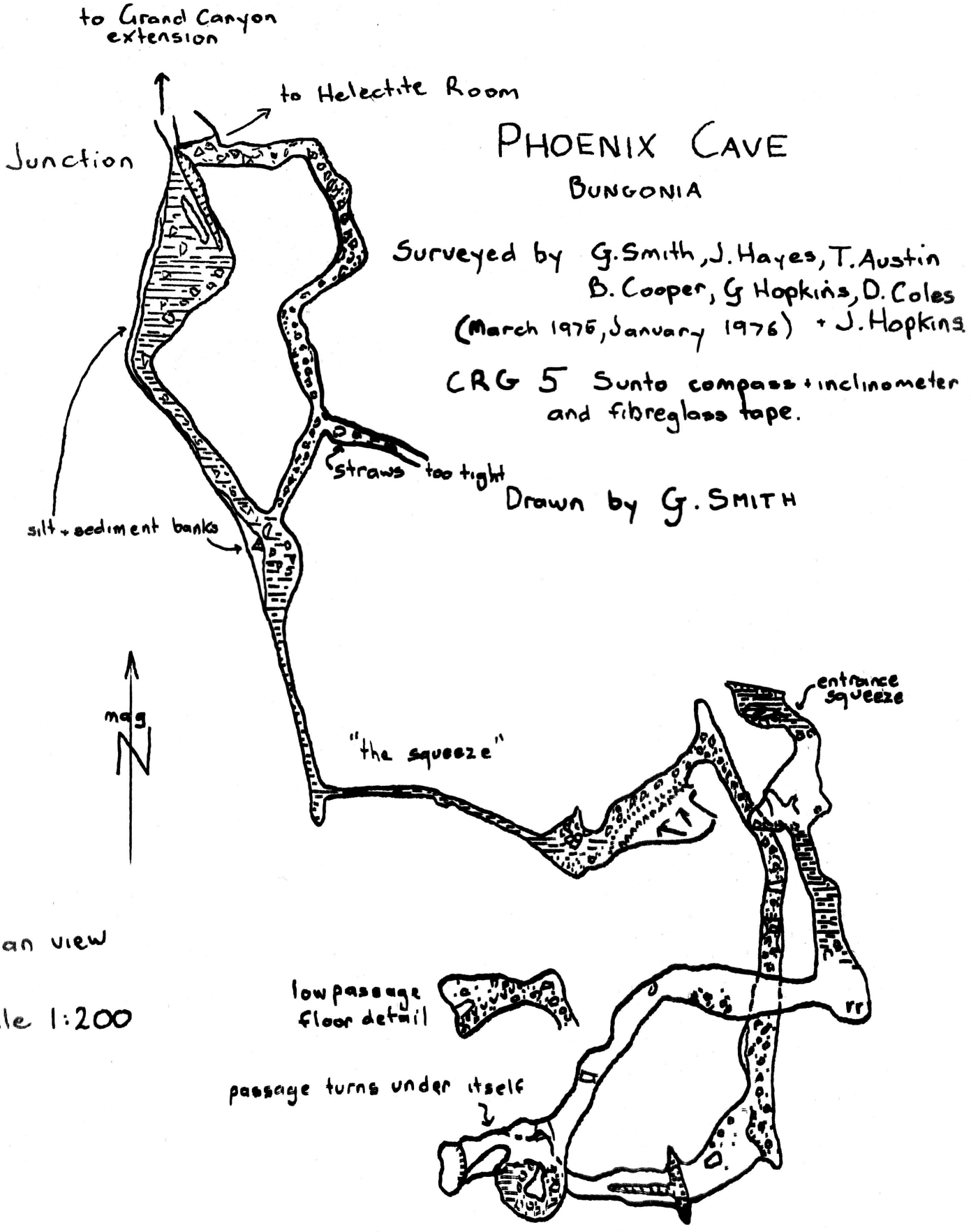
The squeeze makes a right hand turn and again the cave heads north, via a stream passage, which is about 1M high. From this point another passage goes off to the right and rejoins with the stream passage at the junction chamber. This passage is another stream passage descending at about 4° and has one side branch going south till it becomes too tight. (There is some easily damaged formation in this passage and hence it should not be entered).

At the junction there is a 4M drop to a large stream passage about 2M high which closes down suddenly to a tight sandy passage which drops into a rockfall chamber with a small muddy passage entering upstream. Downstream the roof again lowers with a gravel floor. The water this passage carries during flood disappears (apparently) down a hole to the right, which is extremely tight. To the left a 1M climb enters another flat passage with a fluted floor which leads down to the right, to the left back to the "Grand Canyon" extension.

Down to the right a narrow stream passage leads for a short distance past formation into the "Helectite Room", which an impressive display of Helectites can be seen in the roof. On the walls can be seen high water marks. At the far end the cave continues via a rock pile to the top of a two metre pitch, which can be climbed via two small holes nearby. At the base of this climb is a small chamber from which leads an impassable bedding plane squeeze.

The "Grand Canyon" extension leads off from the junction chamber to the north, via some awkward stream passage and enters the "Grand Canyon" chamber where a floor canyon has been cut (up to 3M deep) in deep sediment banks, these could easily be damaged, so it is requested that this chamber be traversed only along the marked track on the top left of the canyon. The roof on the left hand side of this chamber is fractured and unstable. The bottom of the "Grand Canyon" chamber leads to a horizontal squeeze, which opens via a 2M drop into a rock pile above the aforementioned connection.

This cave is prone to high concentrations of CO_2, the squeeze has been observed half full of water and hence does present a danger. Apart from this the highly fluted nature of the cave combined with the lack of height makes touristing as well as speleowork very unpleasant.



PHOENIX CAVE

BUNGONIA

Surveyed by G. Smith, J. Hayes, T. Austin
B. Cooper, G Hopkins, D. Coles
(March 1976, January 1976) + J. Hopkins

CRG 5 Sunto compass + inclinometer and fibreglass tape.

Drawn by G. SMITH

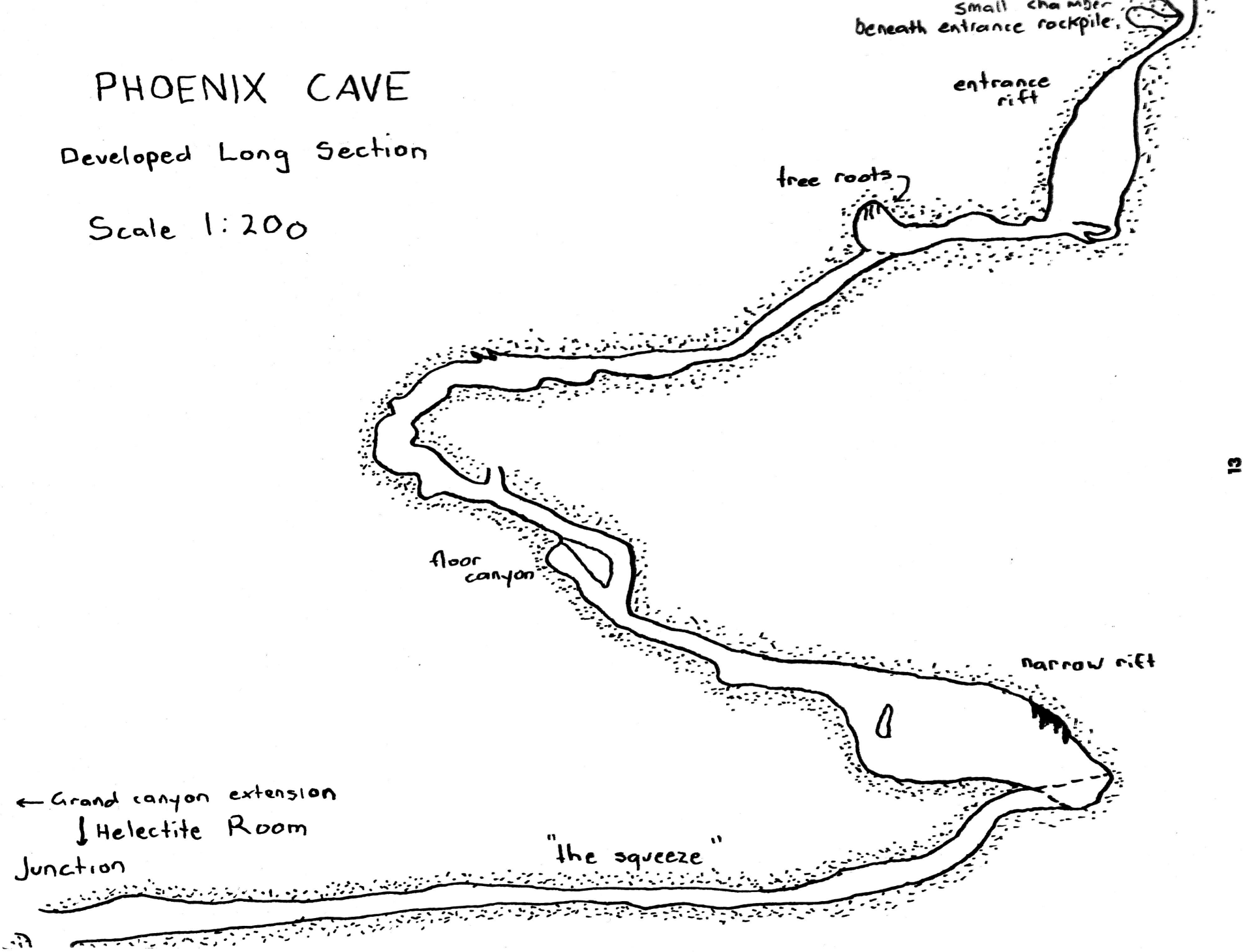
Plan view

Scale 1:200

PHOENIX CAVE

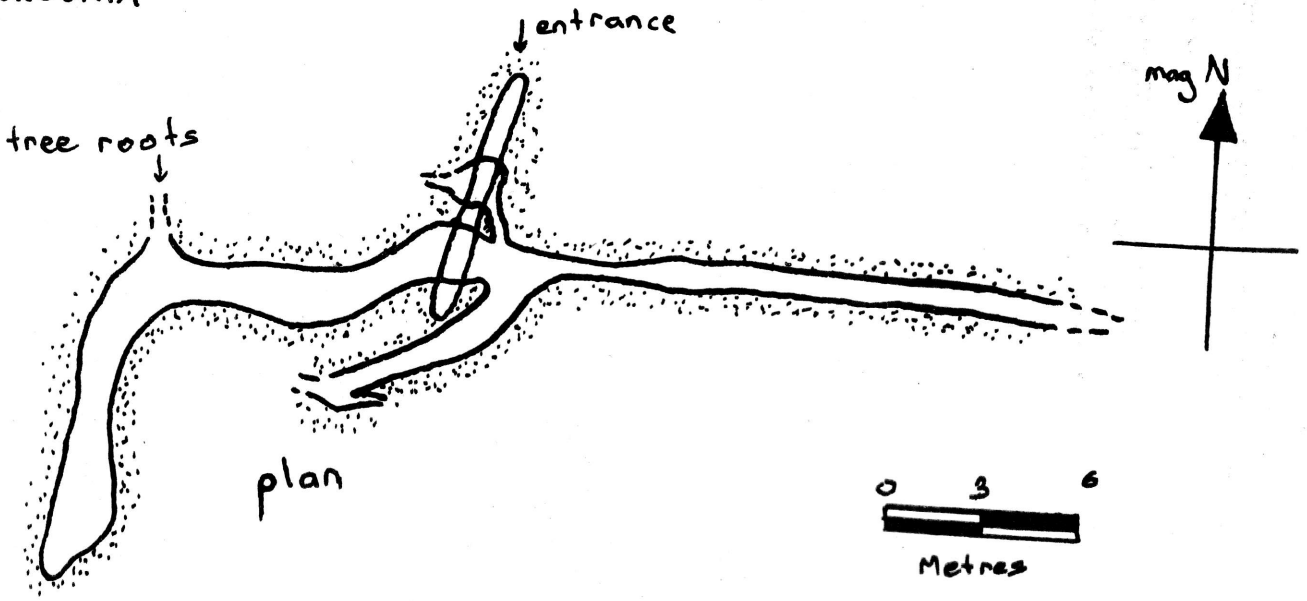
Developed Long Section

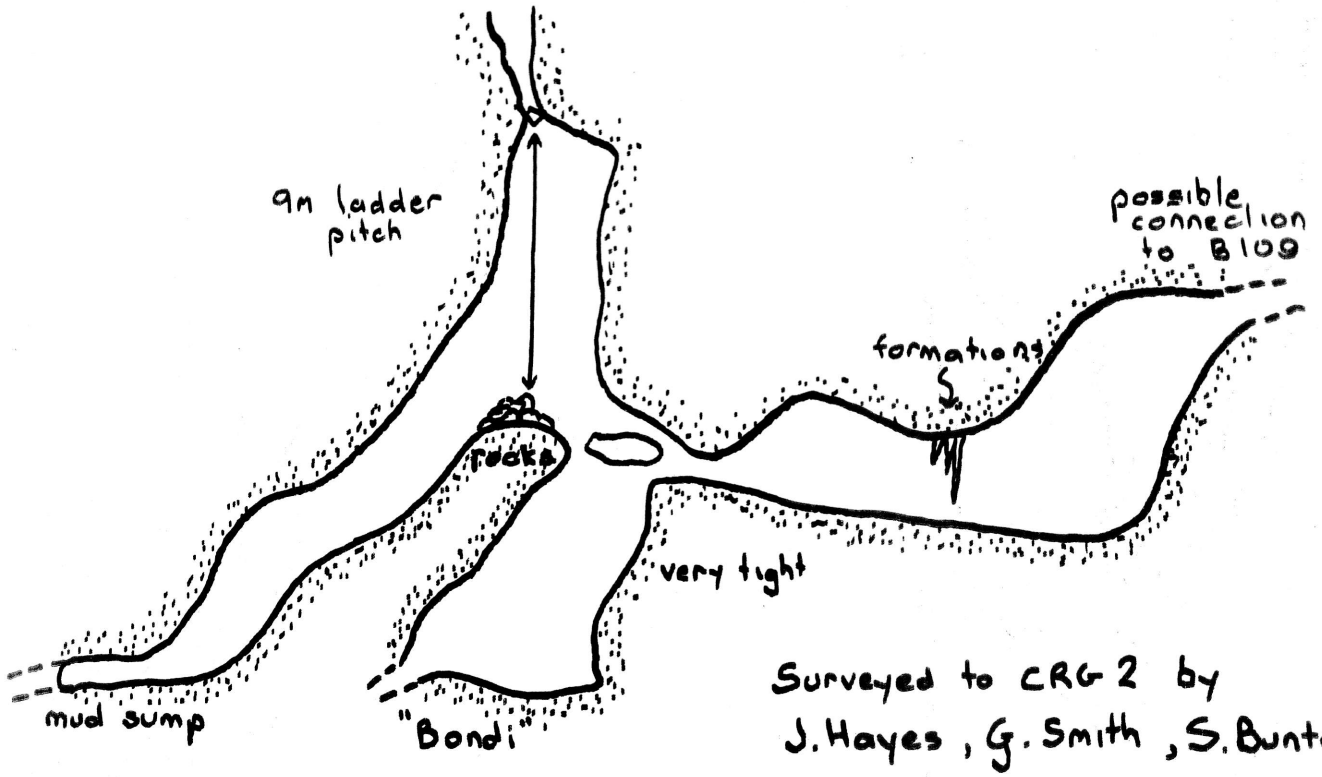
Scale 1:200



PANTS-IN-TAIL CAVE - B39

BUNGONIA





Developed Long Section

Surveyed to CRG 2 by
J. Hayes, G. Smith, S. Bunton
April, 1975

Drawn by J. Hayes

PANTS-IN-TAIL CAVE B39

(First Reported "ARAGONITE"2:4)

JUDI HAYES

B39 is situated on the fence side of the serpentine doline amongst a rocky limestone outcrop. The cave is tight, being rift controlled around the surface and entrance pitch. (approx. 7.5 m). The entrance is in a strike joint which intercepts the main flow down a cross point from origins below B37, 38 & 109. The water then merges to flow down the dip with slow solution tube development to a silt sump which should lead to B34.

From the surface, the entrance is a 1.5m long shot which descends through bedrock and over boulders for 2.4 m, giving access to a narrowing passage which follows the bedding for 3m. Halfway down the ladder pitch, the cave opens up and is considerably larger than the first section. The main passage is the cross joint which may extend upstream to B109. Downstream is the mud sump, which is blocked from the main water flow by a rock fall below the entrance.

The other two passages are younger and thus not as large. The whole cave is young, relatively speaking, and is thus of estimateable finite size with little prospect extension. The dig at the bottom of one of the younger passages, the tight, vertical pressure tube also at the bottom of the pitch, would prove to be difficult due to the lack of room to place the earth.

ORPHEUS CAVE (not numbered)

G. HOPKINS

The entrance is situated in the top lip of a small doline and is a 2.5M vertical drop onto a wedged rock, thence via a rift squeeze incorporating a 2M drop into a small chamber.

Two troughs emerging from the centre of the doline at an angle of 50 degrees were the original development of the chamber, but joint solutioning has since occurred to form it into a lens shaped chamber 2M high, 1.2M wide and 5M in length. From here a rift leads down, it consists of a 2.5M near vertical drop through a hole .5M diameter, thence a 1M step down onto a rock and gravel floor sloping at 35 degrees for 3M to the terminal chamber. This chamber is approx. 2M wide, 7M in length (along the rift) and 6M high.

Silt layers indicate that the floor level has dropped some 2.5M, probably due to heavy rain in the fairly recent past. In the silt floor bedrock is visible with a .3M wide, 1.2M long and 1M deep slit to further siltation, which would make for an awkward dig due to the size.

The cave was discovered and excavated by Evalt Crabb and son Wayne on 3rd January 1976.

SOLAR CAVE (not numbered)

J. HOPKINS

Length: 43M

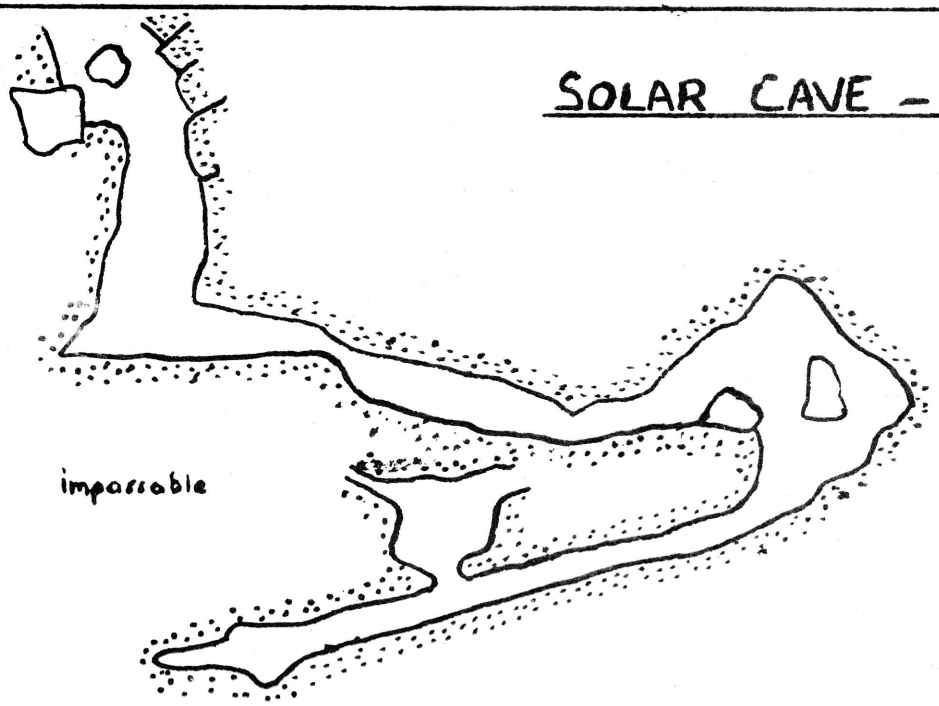
Depth : 8M

The cave was excavated by myself, and Pam Rose on 21/8/75.

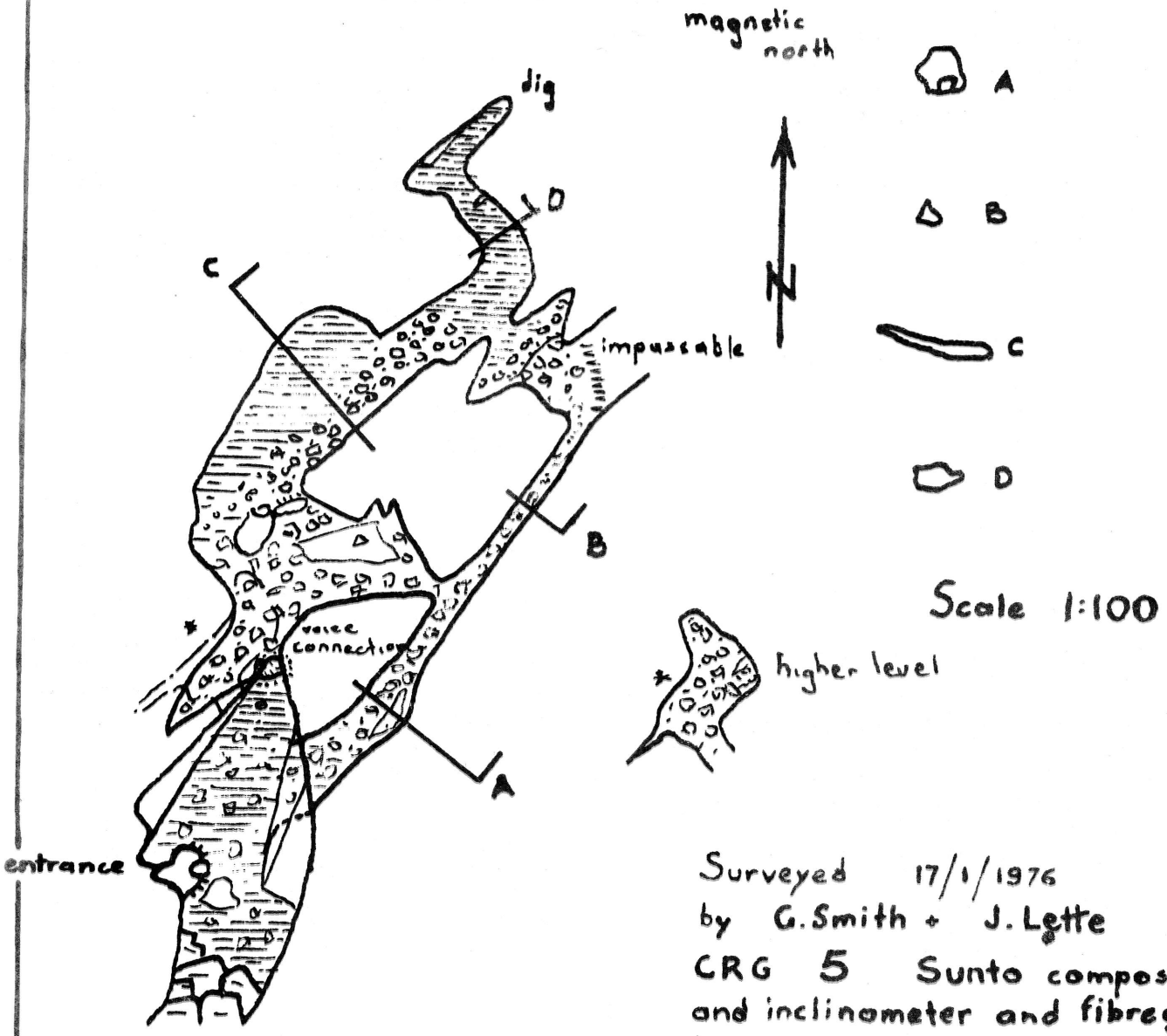
Located in a large doline, the entrance is located in the bottom of the doline, entry being made through a collapsed rockpile into a small chamber, 3m high and 5m long. To the north end of this chamber and up to the left through the rockpile is a small chamber about 2 - 3 m long.

From the entrance chamber beneath some large collapsed blocks to the NE, a stream passage with a rocky, sandy floor. After about 4m a squeeze up to the left allows the rest of this joint natured stream passage to be bypassed. This squeeze enters a chamber about one third the size of the entrance chamber. To the SW side there is a voice connection to the entrance chamber, to the north the cave continues through a rock floored stream passage until finally a dirt floored region and dig is reached. There is a constricted passage up to the right where the dirt floor starts. This joints back to the original joint stream passage where a bedding plane comes down from the NE. This is not passable. The dig is promising as there is a constant stream of cold air out of the cave.

SOLAR CAVE – BUNGONIA



Developed Long Section



Plan

Scale 1:100

Surveyed 17/1/1976
by G. Smith + J. Lette
CRG 5 Sunto compass and inclinometer and fibreglass tape.

Drawn by G. Smith.

BIOLOGY

A NEW CAVE DWELLING SILVERFISH FROM BUNGONIA

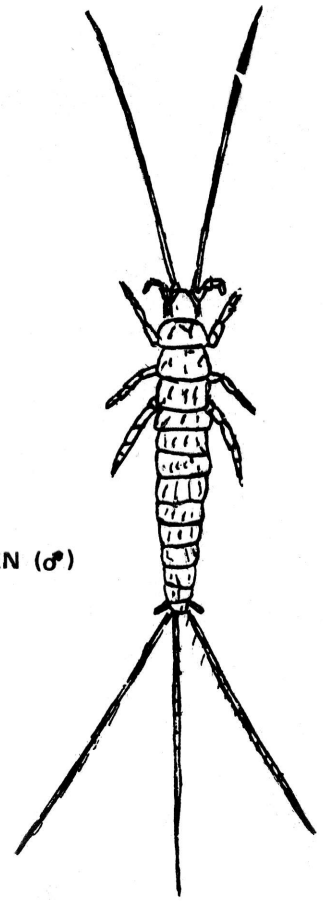
G. B. SMITH

A silverfish was collected from Phoenix Cave, Bungonia, NSW, on the 14th June, 1975, at a depth of about 30 metres. This was quickly determined as an undescribed species of the family Nicoletiidae (as only two species of Australian Nicoletiids have been described). I returned to the cave on the 20th of September and collected a further female and two males from a population that appears to be well established in the cave below 20 metres but absent above this depth. With the assistance and encouragement of Drs' MacDonald, Freitag and Watson these specimens are at present being used in the preparation of a description of this species which will appear in an entomological journal. This article is primarily to indicate speleological significance.

The species belongs to the genus Nicoletia of the family Nicoletiidae; a family which has been found as a cave dweller overseas (Vandel (1965)). Many representatives of this family are detritus feeders and this is most likely, in this case. Some members breed parthogenetically but approximately equal numbers of each sex indicate against this here. Although only two species of Nicoletiid have been described in Australia, a number of specimens have been collected. I have looked at these and none are similar to that taken from Phoenix. All except one was collected from rotting logs or termite or ant nests; the exception is one taken from Kinenabbra Cave (SH40) near Cervantes W.A. on 24/2/1975., by J. Lowry (this was tentatively identified at the time as Trinemura novae-hollandiae).

In appearance the specimen from Bungonia is about 9 mm in body length with antennae and cerci also about 9mm. It is white in colour and lacks eyes (this is a characteristic for the family). It has strong biting and chewing mouthparts with palpi on both maxillary and labial segments. The body is narrow and parallel sided and is large for a member of this family from Australia. Compared to other specimens, the legs are long relative to body length. These proportional differences would probably be an advantage to an organism in a stable environment where it was free to move over open surfaces and not restricted to under rocks and in tunnels.

Silverfish are generally slow breeding and long lived as an adult; this probably explains the absence of juveniles. The breeding capacity of this population is unknown and should be ascertained before any further experimentation is carried out which is likely to deplete numbers.



DORSAL VIEW OF SPECIMEN (♂)

Recently it was observed that on the cerci of the male (ventral inner surface) there was a row of what appear to be papillae. These were not seen on the cerci of males of two other species or on any female. Their occurrance and function is unknown to me but it was suggested that they may be involved in location of the opposite sex in the cave environment. It is hoped that scanning electron micrographs may help to elucidate their function.

At this stage no conclusion can be drawn to the status of this insect as a troglobite or troglophyle as there is insufficient knowledge of Australian silverfish.

I would like to acknowledge the assistance of members of Highland Caving Group and the St. George Area Caving Team in regards to their help in the collection of the specimens and also for their efforts in opening this cave and allowing studies of this unusual insect.

My thanks also go to Dr. J.A.C.Watson for allowing me access to the C.S.I.R.O. collections and also for his valuable assistance in the preparation of a description.

REFERENCES

VANDEL, A (translated B.E. Freeman) 1965 -- Biospeleology: the biology of cavernicolous animals. (Permagon Press: Oxford).

OBSERVATIONS ON BAT POPULATIONS IN DIP CAVE (WJ1) WEE JASPER

JUDI HAYES

INTRODUCTION:

Recently, while national venture activities were being undertaken at Wee Jasper, NSW, several observations were made on a bat colony, MINIOPTERUS SCHREIBERSII. The following is a brief account of what was observed.

OBSERVATIONS:

On 28th December, 1975, while in a large chamber in series 2, dip cave, a strong small of bats was noticed, however, no bats or guano was sighted. On 30th December, series 1 was entered at approx. 7.45 p.m. The smell at the entrance was at first faint, but then became increasingly stronger near the upper level. Either as a result of our intrusion or because it was dusk, a large amount of bats were not streaming out of the entrance of the upper level and out of the cave. A member of the party, after waiting for them to stop flying out, climbed up to the upper level and reported a thick layer of guano with a few footprints at the beginning in it. There were still a large number of bats in the area, however,these were further up in a separate chamber. The smell in the upper level was now extremely overpowering.
On 31st December another trip was made into series 1 and again the bats were active and the smell overpowering.

The trip in on the 1st January, 1976, proved to be quite interesting. Entrance was made at 8.40 p.m. and no noise was heard this time until actually in the upper level. The guano deposits were beneath the highest part of the roof (dome shaped) in the first chamber. The walls and roof were marked by black stains. There had been people in this chamber since the previous visit as the guano had more footprints in it. Alongside the guano deposits was dry soil which contained small colonies of a white fungus. Another chamber with a domed ceiling, further along, revealed more bats roosting.

DISCUSSION:

The significance of series 1 is that this section is a bat breeding area and during the maternity season, should be closed off. There is a large colony of bats residing in here and are of the bent winged variety (MINIOPTERUS SCHREIBERSII). Due to a reasonable number of guanophile (insects etc) and fungal growth associated with the guano, this section appears to be quite active, as with the second chamber further along. The guano mounds themselves are fairly deep (approx. 4 - 5" around the edge and 6 - 7" in the centre) and approx. 200 sq. feet in area, though there is a larger amount in the second chamber. The majority of bats were definitely found in the second chamber, although there were still a considerable amount in the first chamber.

CONCLUSION:

This area is fortunate in being off the main route of human traffic throughout the whole cave and the bats are getting only minimal disturbance. It would, henceforth, be the ideal area for further research and study purposes.

CONSERVATION:

To inform people of the fact that this section should not be visited, a warning sign was left at the top of the climb into the upper level. It is unlikely too many visitors will even reach the sign due to the smell.

CONSERVATION

SUBMISSION TO STATE POLLUTION CONTROL COMMISSION

-JANUARY 1975-

"In reply to your letter regarding our objection to pine afforestation on the Boyd Plateau, we thank you for the opportunity to detail these objections, as we have done below. Although this issue has been the subject of considerable political debate and lobbying, as well as multi-disiplinary research, the comments are exclusively ours.

(1) PRINCIPLE. Although not relevant to the environmental impact, we object most strongly to the continued practice, in N.S.W., of where long term public interest conflicts with short term private profit, the public loses. Inclusion of the granite uplands of the Boyd Plateau in the Konangaroo State Forest instead of the ever diminishing Kanangra-Boyd National Park is a typical example of such irresponsible actions, particularly as the area had previously been gazetted as Reserve No. 67062 for presevation of native fauna and flora.

(2) AESTHETIC. One of the fundamental principles of conservation (i.e. wise management of resources) is that maximum protection should be afforded to any remaining unique examples of landscape, fauna and flora. It is indisputible that the native flora on the granite uplands of the Boyd Plateau is unique in that temperate climate condition; coupled with this is it s proximity to the major population centres of N.S.W. thus making it ideal for field studies by students and scientists of the ecology of such terrain. The landscape value for future tourism cannot be accurately assessed, but socialogical trends indicate that future demands for primitive landscape amenity cannot be met by those few remaining unspoiled areas.

(3) COST/BENEFIT OF PINE AFFORESTATION. There is only one benefit from pine afforestation - short term profit from the sale of woodchip, particularly to the paper milling industry. Even this may be shorter term than at present considered, due to the tremendous amount of research into more economical and more productive sources of cellulose fibre stock.

The long term cost, in terms of damage, far outweigh the above benefit. Ecologically, pine forest can be described as desert condition, as generally no other life form can be supported in it's environment. The normal close balance between vegetation, herbivorous animal forms and their predators and scavengers becomes disproportionately unbalanced, this imbalance affecting quite a large radius around the offending area. A simple example of such economic loss is that where insectivorous birds have lost their habitat, a potentially dangerous level of pesticides are required to maintain any agricultural endeavour in the vicinity, leading to a further imbalance, as well as affecting ground water purity.

An aspect which we feel is not yet sufficiently researched is the long term effect on Warragamba Dam - the Sydney water supply. As the economic life of any water storage system is limited by siltation and salination, then comparative values should be sought in respect of rate of evapotranspiration, level of water table and rate of sheet soil erosion, between pine and dry schlerophyll forest. It would be expected, but this needs to be proved, that pine afforestation would disadvantage the situation.

(4) PROTECTION OF NATIVE FAUNA AND FLORA. Within the Australian community, laws and development are based on purely Christian ethic that all things have been created for man's benefit and enjoyment. However it is our belief that all living things should have equal opportunity for survival, and man has no natural right to harvest from nature beyond filling his survival and comfort needs. By this moral standard then, man does not have the right to destroy the habitat of the many life forms existing on the Boyd Plateau without very good reason, and we do not believe that profit from woodchip is very good reason.

SUMMARY
It is conceded that the present generation is not as enlightened as they should be, and as we hope future generations will be, in their attitude to flagrant exploitation. Accordingly, as it appears that we must have pine afforestation thrust upon the landscape, then suitable areas should be chosen which are not unique, where long term usage will not be affected, and where complete and truthful impact studies have been carried out. If the land cost is higher, then this cost should be bourne as a cost on the product from the afforestation."

E. CRABB. (PRESIDENT)
FAIRFIELD PRESEVATION SOCIETY.

Report and Findings of the Environmental Investigation into the N.S.W. Forestry Commission Proposal for Pine Planting on the BOYD PLATEAU

4 April, 1975

STATE POLLUTION CONTROL COMMISSION

Report and Findings of the Environmental Investigation into the New South Wales Forestry Commission Proposal for Pine Planting on the Boyd Plateau

A. Background to the Investigation

The Forestry Commission of New South Wales proposes to use parts of Konangaroo State Forest, on the Boyd Plateau near Jenolan Caves, New South Wales, for the planting of pine trees as part of its Oberon Pine Plantation Project. This project is, in turn, part of an overall programme aimed at substantially reducing Australia's dependence on imports of forest products by the year 2010.

The Forestry Commission aims to establish 60,000 hectares of pines in the Oberon area, of which it is proposed that about 5,000 hectares will be on the northern section of the Boyd Plateau, within Konangaroo State Forest. The Boyd Plateau has a total area of approximately 13,000 hectares, of which some 7,100 hectares are located in the State Forest, 5,500 hectares are in the Kanangra-Boyd National Park and the remaining 400 hectares are partially cleared freeholds, used mainly for agriculture.

On 13th February, 1974, the Minister for Conservation, the Hon. G.F. Freudenstein, M.L.A., referred the pine planting proposal to the Minister for Planning and Environment, the Hon. Sir John Fuller, M.L.C., with the request that the proposal be examined by the State Pollution Control Commission.

The Commission determined that an environmental investigation of the proposal would be undertaken within the provisions of the State Pollution Control Commission Act, 1970. As part of the investigation, written submissions were invited from interested persons and organisations, the closing date for submissions being 29th March, 1974. Including submissions lodged after the closing date, eighty-three submissions in all were received, some in response to press advertisments, others in response to direct invitation by the State Pollution Control Commission.

Examination of the submissions and the original statement supplied by the Forestry Commission indicated that further information was needed from the Forestry Commission. Accordingly, the Forestry Commission prepared a supplementary statement which was received by the Commission on 5th December, 1974.

Those who made submissions during the initial phase of the investigation were advised on 13th January, 1975, that the supplementary statement was on public display at specified locations. Those wishing to add to their original submissions were invited to do so by 14th February, 1975. Including late submissions, thirty-two submissions were received in response to this advice.

In all, ninety persons or organisations contributed submissions to one or both phases of the investigation. All were put on public display in the library of the State Pollution Control Commission.

Most submissions opposed the proposal, unqualified support for it being given only by Oberon Shire Council, Pyneboard Pty. Ltd., and Timber Industries Limited.

The submissions of most Government departments traversed only those aspects pertinent to their statutory responsibilities, and were uncommitted as to the broad question.

The National Parks and Wildlife Service recommended that a study be made of the biology of the area before a final decision is made to plant pines, the study being aimed at determining whether an adequate sample of the Boyd Plateau is included in the Kanangra-Boyd National Park.

The National Parks and Wildlife Service's submission did not outline any proposed action should it be established that an adequate sample of the Boyd Plateau is not included in the National Park. In its concluding remarks, however, the Service stated that it is not opposed to the pine planting programme, but may require that some specific conditions be included in any approved planting programme.

Whether the State Forest should be incorporated into the National Park is not a question for determination by this investigation. The investigation is concerned with whether a part of the State Forest should be converted to pine planting or preserved in its natural state.

Nevertheless, a decision in favour of pine planting would pre-empt the opportunity for acquiring the area for the National Park, should this prove to be desirable in the future. Due recognition therefore must be given to this in deciding for or against pine planting.

B. Procedure for Conduct of the Investigation

The submissions made to the investigation were reviewed and condensed to a summary of those matters considered to be important to decision-making within the terms of reference of the investigation.

Those who had made submissions containing information on the matters included in the summary were invited to a round-table discussion on 19th March, 1975, chaired by the Director of the State Pollution Control Commission, Mr. E.J. Coffey. All present were given a copy of the summary.

The points arising from the discussion which added to or modified the points included in the summary were identified and recorded as the discussion proceeded.

The agenda and papers for the round-table discussion are appended as Appendix F, together with the notes of discussion as Appendix G.

These documents, together with the submissions, comprise the evidence to which the Commission has had regard in its findings.

C. The Findings of the Investigation

The capital investment in purchasing land in the Bathurst Forestry District to replace the denied land might be as high as $2,000,000, but it is not established that alternative land would, in fact, be purchased were the Boyd Plateau denied.

If it were, the incremental capital outlay of up to $2,000,000 would need to be assessed against the worth to the community of preserving the Boyd Plateau in its natural state. This is a subjective judgment which is not capable of measurement in monetary terms.

The likelihood that alternative land would be purchased rests on two questions:

> Will a pulp plant be built in the Bathurst Forestry District?
>
> If so, what is the area of pine plantation needed for sustaining it and the other desirable forestry activities of the district?

The first question cannot be answered except to say that there is no firm proposal for such a plant. However, the Forestry Commission sees the district as one of the more likely locations for a pulp plant.

The second question cannot be answered precisely. A few years ago the Forestry Commission assessed the necessary area to be 40,000 hectares. The Commission's more recent assessment is 60,000 hectares.

The area available for planting on the Boyd Plateau will not exceed 5,000 hectares, and may be as little as 4,000 hectares. The inclusion or exclusion of this area would not seem to be critical to the planting programme when one has regard for the likely order of accuracy of viability forecasts.

Clearly, there is no case to say that the Boyd Plateau or an alternative area must be planted, even were a pulp plant to be built in the region. It is unlikely, therefore, that a decision to deny use of the Boyd Plateau for pine planting would impose a significant economic penalty on the community.

Nevertheless, the Forestry Commission should not be denied its right to develop the State Forest as a pine forest (as it has planned to do for many years) unless sufficiently weighty reasons exist. The judgment of the State Pollution Control Commission is that sufficiently weighty reasons do exist.

The vegetation on the Boyd Plateau has been subjected over the years to bushfires, to logging and to attacks by phasmatid insects, and these factors have combined to give a fairly open, uneven-aged type of forest, with a variety of tree sizes, sparse foliage, a grassy understorey, and timber which is commercially defective.

Notwithstanding this, the Plateau has a high value for scientific studies, as a habitat for animals, and for aesthetic and recreational purposes. This value will increase with time, since nature will restore the forest to its original condition if it is left to do so without interference from man.

The amenity value of the State Forest when planted with pines would be significantly diminished for bushwalkers and campers and for passers-by on the way to Kanangra Walls and the Kanangra-Boyd National Park, particularly during the developmental years of each successive crop.

The National Park surrounds the State Forest, and is one of the few parks to which the National Parks and Wildlife Service ascribes "wilderness" qualities. These qualities would be diminished by the visual intrusion of pines and the noise of forestry operations.

D. The Features of the Boyd Plateau which Warrant Preservation

The Plateau is an example of high rainfall, elevated (above 1,200 metres) countryside of a kind which is rare in New South Wales, particularly in reasonably close proximity to Sydney, Newcastle and Wollongong.

The Plateau contains a number of animals which are rare and, in some instances, possibly unique. The rare or unique animals are of scientific interest rather than general public interest, but they have special scientific interest because of their primitive nature.

Animals of general public interest also exist on the Plateau, including the wombat and the greater glider. Few opportunities to see the latter two animals are available in other locations with reasonable access from Sydney, Newcastle and Wollongong.

The Plateau also contains some rare plant communities. Of special importance is Boronia deanii and certain hybrid eucalypts which have special botanical significance.

While samples of all the above no doubt could be preserved should pine planting proceed, what would be lost is a well defined physical area in which a rare total ecosystem containing primitive remnants can be studied.

The importance of this to the community can be expected to increase with time, having regard for the increasing awareness of people in environmental matters. In any event, the loss of an area as ecologically important as the Boyd Plateau should not be occasioned without very good reason. Such reason is not seen to exist.

E. The Commission's Recommendations

The Commission recommends:

> That pine planting should not proceed within the Konangaroo State Forest on the Boyd Plateau.
>
> That further damage to the natural environment within the Konangaroo State Forest should not be permitted, except to the extent that it is necessary to assist passive enjoyment of the area by the public.

The Commission sees the recommendations as being consonant with other steps taken to protect the environment of the Blue Mountains, such as the rejection of the proposal to construct the natural gas pipeline across the Blue Mountains and the voluntary surrender of limestone mining leases at Mount Armour on the south-eastern boundary of the Kanangra-Boyd National Park, approximately fourteen kilometres from the Boyd Plateau.

In making the recommendations in this instance, the Commission does not imply any conclusions with respect to proposed pine plantations elsewhere than on the Boyd Plateau.

ENVIRONMENTAL INVESTIGATION INTO THE N.S.W. FORESTRY COMMISSION PROPOSAL FOR PINE PLANTING ON THE BOYD PLATEAU

ROUND-TABLE DISCUSSION 19TH MARCH, 1975

Agenda Item 4 – Summary of Forestry Commission's Proposal

1. The Forestry Commission of N.S.W. proposes to establish about 5,000 hectares of pine plantation on part of Konangaroo State Forest, on the northern section of the Boyd Plateau, near Oberon.

2. The plantings would form part of the Commission's Oberon Plantation Project, in which the aim is ultimately to have a plantation resource of some 60,000 hectares growing in the Oberon area. This project is considered to be economically sound and to be highly significant as a base for local employment opportunities and industrial developments.

3. Parts of Konangaroo State Forest are considered to be biologically well suited to the growth of Pinus radiata, and to be among the most economic sites still available for planting in the Oberon area.

4. Konangaroo State Forest has an area of about 10,000 hectares, of which about 7,200 hectares are located on the Boyd Plateau. The Boyd Plateau as a whole has an area of about 13,000 hectares, of which about 5,500 hectares are in the Kanangra-Boyd National Park (total area 57,000 hectares) and the remainder (410 hectares) in three freehold blocks, largely cleared and used for agriculture.

5. The Boyd Plateau is an elevated dome at an altitude generally over 1,200 metres. Surface topography is gentle and exhibits relatively slight relief, but gives way to steep and scenically spectacular drops on the eastern, southern and western sides.

6. The area has a mixed geological make up, with some granite outcrops.

7. The State Forest on the Plateau carries mostly eucalypt forest, with some swamps developed along the creeks. The eucalypt forest has chiefly an open structure with a grassy understorey. Major forest communities present include brown barrel-mountain gum, mountain gum-snow gum and peppermint types.

8. The forest has been subject to damage from past bushfires and phasmatid (stick insect) attacks, and most merchantable timber has been removed during logging operations carried out between 1945 and 1971. Floristic features of particular note include a rare Boronia, understood to exist mainly within land already set aside as National Park and some extensive swarms of hybrid eucalypts.

9. Most interest in the fauna of the Plateau has concerned certain invertebrates, several species of which are so far known only from this area.

10. Recreational use of the area is largely concentrated around Kanangra Walls, in the southern section of the Plateau and within the National Park.

11. Operations involved in establishing and managing a plantation in this area would be:

a. Logging of remaining native forest within the area to be planted.

b. Establishment of a roading system.

c. Clearing of existing vegetation from areas to be planted, heaping debris into windrows, and burning.

d. Ploughing between windrows

e. Control of rabbits by localized use of 1080 in baits if and where found necessary.

f. Planting of pine seedlings at espacement of 3 metres by 2.5 metres, possibly followed by some spot application of phosphatic fertiliser in selected areas.

g. Pruning of lower branches from developing pine trees at about age 8 years, followed by high pruning of selected trees at intervals of several years.

h. Thinning of stand to produce timber for commercial use, commencing from about age 13 years and being repeated at intervals of 5 to 6 years.

i. Felling of remaining stand at about age 40 years, followed by establishment of new pine crop.

j. Periodic low intensity prescribed burning around boundaries of plantation.

k. Availability of plantation roads for public use.

l. Development of picnic areas and possibly camping areas.

It is expected that the planting would be carried out over a period of not less than 7 years.

12. The major impact of the operations would be to replace areas of native forest on part of the Plateau by areas of pine plantation. The effects on this would chiefly be biological and aesthetic.

13. Minor, insignificant or largely avoidable effects of the operations could be experienced in soil, runoff, erosion, swamps and atmosphere.

14. The incidence of bushfire should be reduced and grazing would be eliminated.

15. The major scenic views from the Plateau would not be affected. The recreational value of part of the area would alter, but not necessarily diminish.

16. To the extent that plantable areas are currently regarded as having wilderness values, these values would be affected.

17. Flora and fauna would be substantially changed in those areas actually planted.

18. The visual impact of planting would be substantial in those areas actually planted, but in those sections of the National Park where people go to seek "wilderness experience", the pine plantings would not intrude.

19. Operations would be carried out with a skill based on over half a century's experience in pine planting by the Forestry Commission, and carried out to standards that are constantly evolving in line with both technological change and with changes in social, environmental and aesthetic attitudes.

20. Specific environmental safeguards to be applied in planting on Konangaroo State Forest would include:

a. Retention of strips of native vegetation along all perennial watercourses and around any swamps.

b. Landscaping of the edges of the Kanangra Walls Road where this passes through the State Forest, with a view to maximising the attractiveness and diversity of outlook from the road.

c. Establishment of a Flora Reserve of about 120 hectares, expected to be in the vicinity of Mt. Whalan, where some of the finest stands of brown barrel are located.

d. Retention of a smaller area of about 40 hectares around the summit of Mt Emperor, the highest point on the Plateau.

e. Retention of a number of sites to preserve hybrid eucalypt populations.

f. Retention under natural vegetation of any sites locally considered unsuitable for planting.

g. Location of windrows more or less along the contours, and away from drainage lines.

h. Periodic monitoring of soil fertility.

21. The only unquestionably unavoidable effects from planting on Konangaroo State Forest relate to the replacement of native forest by pine plantation, and affect the biology and aesthetics of the area. However, the safeguards proposed will minimise the effects of this change. The survival of all species present in the area should be assured, and the Forestry Commission believes that a majority of visitors to the area would find the future pine plantation to be attractive and the resultant diversity of vegetation patterns in the area to add to the interest of a visit to the Plateau.

22. Alternative courses of action available with respect to the proposal of the Forestry Commission to plant pines on part of Konangaroo State Forest appear to be:

a. Carry out the proposed planting, possibly with some minor modifications in detail.

b. Defer planting until all other land resources available to the Forestry Commission in the region have been utilised.

c. Reject planting, and hence reduce the total plantation resource being developed in the region.

23. The Forestry Commission considers that the use of part of Konangaroo State Forest for pine planting, along the lines set out in this statement, represents sound land use and would be in the interests of the community as a whole.

Agenda Item 5 — Economic Considerations Pertinent to Pine Planting on the Boyd Plateau

5a. A number of submissions make the point that current estimates of future softwood needs are based on population forecasts and estimates of per capita needs which are open to serious question.

This argument is advanced to show that the Boyd Plateau planting is unnecessary from an overall supply viewpoint.

5b. The correctness or otherwise of this would not seem to be as significant to a decision on the Boyd Plateau as is the question of the minimum plantation needed for a viable industry in the Bathurst district, comprising efficient sawmills, particleboard manufacture and a pulping plant.

The Forestry Commission has said that 150,000 hectares are needed, and that if the 5,500 hectares of the Boyd Plateau are not used, an area equivalent to that must be planted elsewhere in the Bathurst district. It claims that the Boyd is the cheapest of the available alternatives.

5c. A number of submissions question the correctness of the Forestry Commission's thesis. Important arguments that have been presented are:

The Forestry Commission has not provided a proper cost benefit analysis from which the economics of alternative areas can be properly assessed.

In June, 1970, the Forestry Commission stated that "the 18,000 acres within the Konangaroo State Forest are vital to build up the plantable area in the district to 100,000 acres. . . . . the minimum required for an economically viable kraft pulp plant". In November, 1971, this statement was repeated, but when the 100,000 acres target was reached early in 1973, the minimum was raised to 150,000 acres. Why?

Whilst a value was imputed in the comparative analysis for land at Oberon ($150 per acre) and Burraga ($60 per acre), none was imputed for the Boyd Plateau. The validity of the assumption that areas for preservation have no monetary value in comparative cost/benefit evaluation has been questioned in a number of submissions.

Others question the viability and acceptability of establishing the pulp plant on which the need for a large plantation acreage is predicated. It is argued that the environmental consequences of a pulp plant should be considered and resolved before planting plans are firmed up.

Agenda Item 6 The Environmental Features of the Boyd Plateau

6a. A number of submissions claim that despite heavy logging of the Plateau and intrusion of roads and trucks, the forest is still attractive and pleasant to walk through. It also has been said that if left to continue without the interference of man, nature will restore the forest to its original condition in time. It is thus argued that the present condition of the Plateau should have no bearing on the determination of its future.

6b. It is claimed that the natural resources found within the State Forest are not equally represented within the National Park.

6c. For example, it has been said that the *E.fastigata* – tree fern gullies do not occur in the park.

6d. Nor does Boronia deanii, which occurs on the Plateau and is a rare species in New South Wales.

6e. The area of high rainfall plateau country of 4,000 ft elevation in N.S.W. (or elsewhere on the mainland), is very limited. Most of it has already been cleared and the Boyd, with Barrington Tops, comprises the only substantial areas of such forest-covered upland country readily accessible from Sydney, Newcastle and Wollongong. The other areas are in the Snowy Mountains.

6f. Its road access and short travelling time from Sydney, Newcastle and Wollongong make the Boyd Plateau particularly suitable for scientific studies. With future population growth in the Bathurst/Orange area, its location and accessibility becomes increasingly important.

6g. The Department of Agriculture has stressed that the Plateau includes substantial areas of tall forest vegetation on granite and metamorphic rocks, and it is scientifically important that considerable areas of such forest be preserved in the Central Tablelands of the State.

6h. The area includes a plant community in which one of the major constituents is a eucalypt not readily assigned to any of the well defined and well known species. This appears to be a derivative of hybridization between *Eucalyptus dalrympleana* subspecies dalrympleana (Mountain Gum) and *E.viminalis* (Ribbon Gum). Such widespread intergradation between these two *Eucalyptus* species is not known in any other region of the State.

6i. The Boyd Plateau Ecological Study Group states that, from preliminary surveys, it appears that the major part of the populations of both wombats and greater gliders on the plateau are in the State Forest area. The wombats may re-invade the pines but the glider, with its more restricted habitat requirements, would suffer grave depletion. This may also be true of lyre birds.

6j. The Group claims that a number of invertebrate species and genera appear to be either unique to the Boyd Plateau or very rare in other areas. Most of these occur in the litter in the moist forest gullies, which are best represented in the State Forest region. It is claimed that these animals, although small and for the most part unspectacular, are of great scientific interest, many being primitive representatives of their groups

Such animals include:

Spider genus *Gradurgula,* a primitive spider thought to be a relic of the stem group from which the 'true' spiders evolved.

Eleven species of harvestmen *(opiliones)* (only two of which have been described in scientific literature).

Several new genera and species of slater *(Isopoda)* currently being studied by Professor Vandel of Toulouse, France.

The Alpine skipper butterfly, *Oreisplanus munionga,* restricted by its breeding habits and life cycle to the peat bogs.

A moth *Anthela oressarcha,* probably under the same habitat restrictions as the moth.

Peripatus, the evolutionary link between the annelid worms and the arthropods, which although it occurs in other parts of the Tablelands, on the Boyd is restricted to areas currently in the State Forest.

The hairy cicada.

Agenda Item 7 — Visual and Aesthetic Considerations of Pine Planting on the Boyd Plateau

7a. The National Parks & Wildlife Service points out that a well established pattern of recreation use has developed on the Boyd Plateau of a diffuse wilderness camping and bushwalking nature. Traditional camping areas have grown up on Budthingeroo Creek and the junction of Box Creek and the Tuglow River. One further recognised camping area lies within the Kanangra-Boyd National Park on the Boyd River.

7b. Because the pine forest would cover the highest land in the district, parts of it would be visible from most vantage points in or around the park for distances up to 30 miles. The appeal of the park is its primitive character, particularly when viewed from the mountain resort towns. It is said that it is now possible to see the Southern Blue Mountains much as they appeared in 1788, and that this is a scenic and historical asset which should not be destroyed.

7c. The dark colour and precise skyline produced by a pine forest are a visually alien element to the native landscape.

7d. People would find it almost impossible to walk through any but a mature pine forest, as the floors of immature forests are covered by the lopped lower branches of the pines.

7e. The monotony of walking through trees of the same species, colour and size, with few birds or animals, cannot be compared with the experience of walking through the diverse native forest at present on the Plateau.

7f. For at least 14 out of every 45 years the forest would be visually unattractive while awaiting the trees to develop.

Agenda Item 8 — The Viability of the Remaining Natural Environment of the Boyd Plateau after Pine Planting

8a. A number of submissions claim that the Forestry Commission's plans to preserve rare or desirable plant communities on the Plateau will be abortive.

8b. For example it has been said that the minimum area required to maintain a viable ecosystem on the Plateau is 4,500 hectares.

8c. It is suggested that the remaining eucalypt forest will be made more vulnerable to phasmatid attack following depletion of the existing eucalypt forest. Experience has shown that over-logging of mature forests encourages phasmatid invasions.

8d. The Department of Agriculture points out that the swamps are developed in a nutrient poor environment. Since the Forestry Commission intends fertilizing plantings within the granite areas, the Department of Agriculture states that excess nutrients will be absorbed on the clay particles and erosion will wash these particles into the swamps. While this may not cause eutrophication, it will certainly cause increases in nutrient levels in these swamps.

8e. There is a widespread view that the offer to preserve strips of vegetation 20 metres wide around perennial watercourses and swamps cannot be considered to be of much value in any visual or environmental sense, and is probably of little ecological value.

8f. It also has been suggested that the small "flora reserves" recommended by the Forestry Commission do not take into account "territories" set by animals such as gliders, possums, wombats and macropods.

8g. Initial clearing of the land by the proposed method of bulldozing will completely destroy the natural habitat. Vertebrates such as some possums, the macropods, wombats, birds and some of the reptiles may re-establish themselves by migration from the park, but the habitat would not be suitable for some years. The invertebrates and smaller vertebrates which depend on the litter and understorey would never be replaced.

Agenda Item 9 — Ecological Effects Beyond the Pine Plantation

9a. Concern has been expressed at the possibility of harm to the National Park watercourses from silt and nutrients washed and leached from the pine plantation.

9b. The risk of erosion after clearing is greatest on slopes over 15^{o} and on soils formed by granitic type rocks. It has been stated in a submission that about 25 per cent of the proposed planting area is on slopes in excess of 15^{o} and about 30 per cent on granite soils. It is further suggested that the areas where both these risk factors coincide are predominantly included in the proposed planting area.

This calls into question the delineation of boundaries of the proposed planting area.

9c. Concern also has been expressed at the potential for pines to migrate into the National Park. Examples are quoted of significant migration from pine plantations.

9d. It is claimed that control burning for protecting the pine plantation will need to be within the National Park rather than within the State Forest.

9e. Fears have been expressed about the effects on wildlife, both in the State Forest and the National Park, from using the poison 1080 for rabbit control.

Agenda Item 10 — Effect of Pine Planting on Camping Potential of the Boyd Plateau

10a. There is only limited camping area in the adjoining National Park on the Plateau, being mainly the Boyd crossing on the Kanangra Walls road.

10b. The demand for camping accommodation by those who seek to enjoy national parks without strenuous exertion, or wish to establish family camps, is increasing very rapidly.

10c. Much of the present Kanangra-Boyd Park can be seen and enjoyed only by the fit and agile, because its negotiation involves climbs of several thousand feet, rock-hopping and much rough scrub walking. The Boyd Plateau is ideal for those not capable of this type of activity because it is mostly open undulating or flat bushland involving no steep climbs.

10d. The Konangaroo State Forest could be used to absorb the heaviest camping and recreation pressures, thus allowing the more vulnerable scenic areas of the Boyd Plateau to be preserved as long as practicable.

10e. Camping is at present not permitted in pine forests other than at designated picnic spots.

Agenda Item 11 — The Need for Studies to Better Assess the Environmental Worth of the Boyd Plateau

11a. The National Parks and Wildlife Service has advocated that a careful study should be made of the biology of the area to ensure that an adequate sample of the Plateau has in fact been included in the National Park. The Service states that this study should be completed before a final decision is made to plant pine, and it should be carried out by a competent authority.

11b. The Service further suggests that in any study of the future use of the Plateau the rationale of the present boundaries should be carefully examined in the light of requirements for park management, including protection, ease of recognition, buffer requirements for visual screening and access into the National Park.

11c. Many submissions claim a strong case exists for the State Forest to be incorporated into the National Park. This future option is denied once pine planting is carried out.

JAUNTER CAVE LISTING

PETER DYKES

The following is a partial listing of tagged and documented caves in the Jaunter area. This work, undertaken over the last three years by St.G. ACT. is still in progress, and will be extended in the next issue of this journal.

It should be noted that severe restrictions apply in respect of access to the private properties involved, and due to past serious misbehaviour by cavers. I have gained exclusive access on a limited basis, to carry out work of a purely speleological nature only. Any violation will lead to complete closure.

Any enquiries on this basis should be directed to:

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538 PORT HACKING ROAD,
CARINGBAH. NSW . 2229

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JA1. SOUTHERN TRICKETTS ARCH

An inflow cave of about 30M of passage. The cave begins with a small entrance chamber and then continues in a series of low passages. During the wet months entry is restricted to the entrance chamber. In May 1975, the water had dropped sufficiently for further exploration. B. Cleaver gave the report that after the entrance chamber, the cave drops through the floor and continues on over gravel until reaching a gravel barrier. After passing three of these barriers the cave opens up into bedrock with an aven and rimstone. The cave continues past a drop about 5 ft. deep until it opens out into a chamber with lens shaped squeeze at the end of it.

JA2. NORTHERN TRICKETS ARCH

An efflux of 180 ft. of passage. The cave continues up over a series of rimstone pools and to a wet flattener. In February 1975 Wayne Brown succeeded in pushing the wet flattener for over 8M whereupon the cave continues through a very tight and difficult squeeze in the ceiling. After the squeeze the cave opens out into a small cavern with two possible leads. One definitely does go into a small chamber but entry is impossible because of the tightness. At the entrance there is a small wet passage leading off from the right. It should be noted that here, even in the dry season where the rest of the cave "dries" up, this passage still has a stream running in it.

JA3. BOURCHIER CAVE

The cave is about 50 - 80 ft. long and is a series of squeezes along a low passage. The main route opens out into a small chamber with an array of formations. The cave then continues through a squeeze into a small chamber with a 14 ft. drop. This drops into a mud floor chamber. There is also a 10 ft high aven opposite the main passage. From the previous chamber the cave develops into a long wet flattener and ends in a wall of lowstone and formations. Of special significance are the old signatures in this cave.

JA4. BONE CAVE

A tunnel about 30 ft. long with a squeeze in the middle. The floor is covered with mud, small rocks and bones.

JA5. LUTH'S HOLE

The cave drops 11 ft. through a hole to a sloping floor in a small chamber which contains a daylight hole. At the end of this chamber is found a short passage ending in a likely looking dig. There are some dead formations on the wall and ceiling.

JA6. DAYLIGHT HOLE TO JA5

JA7. SNAKE CAVE

A series of holes makes up the entrance which lead to a chamber with a dirt floor. The cave goes on to another chamber with a few short passages leading off. The whole cave is quite dusty and void of formations

JA8. RIVER CAVE

The cave is about 180 ft. long and consists of a low chamber, at the entrance from which leads a passage, the floor of this being covered with water ranging in depth

from 6 -- 8 inches. This section is about 60 ft. long and it appears that in the dry season the water level falls. At the end of this passage the cave continues up a slope to a chamber with a mud floor. From here the cave continues through a 25 ft. long squeeze which slopes upwards and enters two small chambers. The cave ends here in a series of very tight mud filled passages.

JA9. An efflux with water flowing from under a rock.

JA10. Cave drops 10 ft. to a dirt floor.

JA11. THE BOX

A drop of about 20 ft. to a cavern with a sloping rock strewn floor. The entrance is very dangerous due to loose rocks. The cave continues down through a tight squeeze to a rock and mud floor.

JA12. THE GRIKE

The cave drops 30 - 40 ft. to a rock floor with a short passage leading off.

JA13. Cave drops 30 ft. to a small chamber

JA14. GREGS CAVE

A sloping entrance followed by a drop of about 30 ft. to a chamber which appears to have a false floor.

JA15. Daylight hole to JA13.

JA16. Other entrance to JA7.

JA17. KAYAKA CAVE

This cave is very tight and goes down over a rubble choke floor. The passage slopes steeply (about 40 degrees) to a squeeze. The cave then becomes horizontal, going off to the right and then dropping 3 ft. to rubble.

JA18. Daylight hole to JA17.

JA19. The cave has a tight entrance into a passage which drops about 5M and then continues on through a very tight and difficult squeeze.

JA20. The drop of about 9 - 10M to a chamber with a red clay/dirt floor. On the low side there is a passage leading to another chamber.

JA21. A small cave going in 1M and down 2M. Earth filled.

JA22. YEPPA CAVE

The cave goes down at an angle of 10 degrees for about 1½M and then takes a 45 degrees left hand turn, still going down at the same angle for about 1.8M then makes a right hand bend and goes along horizontal. The whole cave is tight and difficult.

JA23. Has a tight squeeze at the entrance followed by about 10M of low passage. Some old and worn formations are present.

JA24. Daylight hole into JA27.

JA25. " " " "

JA26. " " " "

JA27. Normal entrance to cave. Tight squeeze at entrance leading into a chamber. Cave then continues through another squeeze into a small cavern.

JA28. Solution tube entrance with passages leading off right and left.

JA29. BINDAREE CAVE

Efflux active stream passage cave about 50 ft. long. Some active and broken formations, signatures and occasionally bats are found.

JA30. DIRKANALA.

The cave is a series of stream passages running left to right from the entrance, along an active stream. Sumps along both branches.

JA31. GARGARIAN GROT

An inflow, about 150M long. The cave has an initial drop of about 8M to a gravel passage. From here the cave winds along this gravel passage, with a few avens in the ceiling until it finally sumps into an impressive lake known as Lake Leaver. The cave is possibly connected to Tugelella.

JA32. TUGELELLA CAVE.

An outflow cave of about 900M of passage and some impressive formations. The cave appears to be the result of two drainage systems. (A separate article on this cave will be published later).

JA33. Entrance into Tugelella Cave.

JA34. " " " "

JA35. " " " "

JA36. HORSE-SKULL CAVE

Cave drops about 3M to a sloping mud floor which leads to a squeeze. This is reported to be used by Henry Hogan (an early pioneer of the area) in disposing of a stolen horse.

JA37. GEMINI CAVE

About 50M of passage. From the entrance the cave drops down a slope into a small cavern then up through a squeeze into another chamber. At either end of this chamber are passages leading to the entrance.

JA38. Other entrance to JA37. Drops down a shaft about 9M to a squeeze which leads back into the back chamber of JA37.

JA39. WYERA CAVE

Cave drops about 4M to a dig currently being dug out by the ST.G. ACT.

JA40. KUMBOOBIE

The cave drops initially around 7M to the floor. As you enter, the left hand side slopes away to a small hole. The rest of the cave leads to the right. It slopes steeply down to a small chamber. As you come down the slope, if you go off to the right before you enter the chamber, you enter a large passage (2M by 2M). This passage goes off for about 15M. On the right side of the wall is made up of loose gravel and river stones. Progress was stopped at the squeeze at the end of the passage when the rubble wall started to move.

JA41. Doline

JA42. "

JA43. "

JA44. "

JA45. "

JA46. APOLLO CAVE

Cave drops about 2M into a small cavern and then proceeds through a squeeze in JA37.

JA47. 9M shaft with rocks and dirt floor.

JA48. Doline

JA49. "

JA50. "

To be continued next issue of the HCG Journal.

See You Next Issue