

CAVE EXPLORATION GROUP SOUTH AUSTRALIA Inc.

c/o South Australian Museum, North Terrace, Adelaide

VOLUME No: 27, No: 1 MAY 1982



N E W S L E T T E R



CAVE EXPLORATION GROUP SOUTH AUSTRALIA Inc.

MEETING TIME: 4th Wednesday of each month at 7.45 p.m.
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COVER PHOTO

"The Sail" - Mullamullang Cave, W.A.

This Newsletter is Registered for Posting as a Periodical, Category B.

EDITOR'S TRITE COMMENTS

This Newsletter is the first of the 1982 Newsletters. This issue is, despite last minute doubts, going to make it with quite a bit of news.

There has been quite a lot of activity during the last few months, and it is a pleasure to report it.

I am looking forward to a year continuing like this one has started.

NIMBLE.

WHAT'S ON THE LAST PAGE ???

DO YOU WISH TO GET ANOTHER COPY OF THE NEWSLETTER?

Those people listed on the back page will not receive another copy unless there is cause to remove their names from the list. This is unfortunately beyond our control but is within yours. Thanks for your co-operation.

cegsa/vsa DINNER

S.A. CAVERS UNITE!

Ye olde colonial convicts, the dreaded VSA, are already boasting about outdoing us at this year's culinary extravaganza.

The venue this year is The Royal Oak Hotel, Main Street, Penola (approx. opposite the Millicent turnoff) at 7.00 p.m. on Saturday, June 26th, 1982. Cost will be \$8.00 per head for a 3 course meal.

Camping is being arranged at Penola. The weekend promises to be great. Nearby are spectacular, often overlooked caves, good wineries and some historical tourist attractions for those not interested in caving.

The honour of S.A. Caving needs

you!

TRIP REPORTS

NARACOORTE and MT. GAMBIER

PARTY: K. Mott, J. Mott, G. Ninnes, E. Bailey and Family.

26th - 29th December

Ostensibly this trip was scheduled to join up with an A.B.W. trip led by Dave Turner. When we arrived at Naracoorte we called in to see Harry Baker only to find he had already left for Adelaide. Next time. Harry, I promise to use Palmolive Gold. To fill in the rest of the afternoon. Nimble and I surveyed section 358, Hd Robertson (the former Stone reserve that now forms part of the cave reserve). The fences in the area are not on the boundary line and we wanted to know where the boundaries are to determine possible hut sites. The most ideal site, as it turns out is in private property. The owner, however, is not willing to grant a lease over the area. When we arrived back in the camping area we had to assist one of the park staff as she had locked her keys in her caravan. Fred eventually came along and saved the day. He had stashed a length of wire under the caravan having anticipated just such a situation.

After tea we showed the park staff the route to Strawhaven. Part of the reason for this trip was to assess the effectiveness of the washing programme undertaken by Flinders Uni Speleo Society. Those areas washed appear to have developed a hard, dry, grey, flaky coating. At this stage we can only speculate as to the cause of this but further research is obviously needed before any further washing attempts are made. John Callaghan would be useful to consult as he has had wide experience in cleaning decoration at Jenolan. It would be wise to consult him before he moves back to N.S.W. and we lose his expertise.

Sunday we intended to join Dave and the A.B.W. crew for a look at Beekeepers. The bushies however decided to try Brown Snake first. Knowing the entrance and using discretion as the better part of valour (a fancy name for avoidance of the cork syndrome) Nimble and myself opted to Beekeepers. Although I have visited the cave numerous times I was amazed at the amount of the cave I had not seen before. How easy it is to slip into the habit of trogging to death only those areas we are over-familiar with. The sump in Beekeepers was damp with a few small pools of water. After Beekeepers we visited Henschke's Quarry. Whilst there I thought I would survey in another "Final" extension to the cave for Neville. After half an hour of slithering over jagged rocks in T-shirt, stubbies and bare feet it was decided that the "extension" was really only a pimple on a boil and the attempt was abandoned.

Ed and Jonathan joined us after lunch for a look at Cave Park Cave. This cave is rarely visited by cavers. For too long we have been stuck in a rut visiting only one or two more well known caves. Some one in the past has spent an impressive amount of time digging in this cave. The evening was pleasurably spent showing the temporary permanent staff member of the park the seamy social side of CEGSA.

The Monday and Tuesday saw a tactical change of modus operandi. Ed and family stayed at Naracoorte to await further hordes of cavers, while Nimble and the Mott entourage travelled on to Mt. Gambler. The two days were fruitfully spent doing relocation work and entrance photography in the hundreds of Blanche and McDonnell. Usually you set out to locate one cave and find up to 4 extra ones.

Caves located - N203 - N208

4 un-numbered features

Caves photographed - N203, N204, N205

Caves trogged - N203, N204, N205

Caves mapped - N203, N204, N205 and N207

The trip back to Adelaide turned out to be very long with the Crown suffering from vapour lock all along the Coorong.

We had to stop at Meningie to let the vehicles cool down. It is rather strange getting up in the morning to 7°C temperature then driving home in 40° + heat.

KEVIN MOTT.

TASMANIA

January, 1982

A trip combining bushwalking and caving seems to me to be the most ideal holiday in Tasmania. It was for a holiday like this that I set off in January not knowing where I would eventually go.

Leigh Gleeson had set me up to stay with friends in Hobart (Sue Backhouse and Steve Harris) and this I did and thoroughly enjoyed myself. I was treated to a Southern Caving Society Meeting at which ample fluid is consumed whenever interstate visitors are present (and whenever they are not present!)

I discovered that the lull in enthusiasm for caving is creeping in over in Tassie caving circles. Heaps of caves but not enough cavers to do the exploration and lead caving trips. The suggestion was made that each mainland caving group should adopt a Tassie area to explore, survey and generally enjoy. There are many limestone regions which are still to be explored.

A trip to Exit Cave near Ida Bay in the South was what I was really keen on and this was organised. It was a short trip on a hot and humid table. A very hard walk ensued; when I say walk, I should be more specific - we walked for 20 minutes on the wrong track blazing through a Mines Department survey line spending most of the time clambering over branches and fallen trees 1 metre off the ground. Since the walk to the cave entrance was supposed to take between an hour to an hour and a half, I wondered how I was going to manage the track for the rest of the way. Luckily it was the wrong way and we turned back to the road again. The correct track was an absolute pleasure in comparison!

Exit Cave is amazing - the small amount that I've seen entices me back. Glow-worms adorned the passages close to the entrance and to lie on my back looking up at them with all the torches off was like looking up at the stars on a clear night. It is amazing that their act of luminescing does not use up more energy than can be made by attracting prey to their "web". It's "web" is comprised of hanging, sticky strands to trap insects as they are attracted to the light.

Well, we didn't see much of the 16 kms. of tunnel that day - approx. 1 km. (if that) was reached and it was time to return to the road again. Having kept virtually dry in the cave we decided to do the right thing and get wet to our waists by wading through the stream - you don't feel like you've been caving in Tassie unless you're soaked and chilled at least waist high!

Caving friendships are always made on trips and Phil Jackson (President of S.C.S.) has recently been to S.A. and has been involved in the recent Nullarbor and Flinders trips. We hope to see more of the Tasmanian brigade over here for the Conference in January. We are looking forward to the paper to be presented by Leigh Gleeson entitled "Armchair Caving - a personal view" !!

Whilst walking near Lake St. Clair (in the Cradle Mountain Lake St. Clair National Park) I met Kevin Kiernan, an avid caver, and founder of the Tasmanian Wilderness Society. Recently he, Steve Harris and others found 8 or more sites of Aboriginal relics in the Franklin area in S.W. Tasmania. Please continue to give them your support by writing to politicians, both Tasmanian and Federal, to tell them why it is a National issue to preserve S.W. Tasmania.

Kevin Kiernan is quite a character and hopefully, will be here for the Conference to provide some insight into the exciting exploration going on in the dense and rugged S.W. One very colourful expression of his was calling Harry Butler, the man who is providing the Tasmanian Government with advice such as "It's alright to start mining within Cradle Mountain National Park" and advice on how to ruin the least amount when the Franklin Scheme begins -- 'A BIOSSTITUTE !!!'

MEREDITH REARDON.

NARACOORTE

17th - 18th April, 82

PARTY: K. Mott, M. Reardon, G. G. Ninnes, K. Johns

Most of the party having led depraved deprived childhoods and not been caving at Penola we decided to venture down that way for an easy day's caving.

A quick guided tour of the area showed them the locations of the various features prior to settling down to the serious side of the trip. Must be serious as we actually intended to do some caving; and did. 5L23 is a cave first explored when Athol was a "young" caver and seldom seen since till Peter Hill chatted up the owner. Last January long weekend in between going to church and looking at historical houses, some caving was done at Penola. This included exploration of George Varcoe Cave and L23. Peter had previously uncovered the entrance from the jungle of bracken. This is why no-one could relocate it; it is not on the ridge but on the flat hiding behind a bracken fern. Thankfully the owner stopped over enthusiastic council workers from burying this entrance under mega-tonnes of sand as they did L22.

Enough of the historical garbage and back to point in hand. (leave it alone). It was decided to survey the cave to determine how accurate our estimation of distance on previous trips was. Turned out to be spot on. A very pleasurable 3 hours was spent surveying a line traverse through the cave; the northern section of which extends for 150m. The cave has everything a self respecting caver could want. Plenty of places to rest, walking type chambers with pretties, crawly bits, emasculating rocks and smooth flat floors which turned out to be giant rimpools.

On our return to Naracoorte we discovered that Lindsay Jolley had been looking for us to discuss the possibility of a hut site near Sand Funnel. As we missed him Bill Pyecroft the Ranger would act as negotiator the next morning. In the meantime a minor crisis had occurred as someone had stolen the Fossils from Victoria Fossil Cave. The police were called in and are investigating the incident. That night a rather pleasant tea in Naracoorte was a prelude to an entertaining night with some elderly sherry sipping Scottish tourists.

The next day we spent the morning discussing the hut site and its associated problems with Bill. Meredith, Ken and Nimble later went on a trip through Sand Funnel Cave.

KEVIN MOTT

NULLARBOR

Easter Ecstasy!

PARTY: Julia Whittle, Peter Morris, John MacCormack and myself.

Many others went for cave diving and caving over this period and the following week:

Terry Reardon, Phil Jackson (Tas.), Mike, Zeke, Barb, Karel, Dave, Vap, Ric, Susie, John, Melina, Chris, Karen and Mike.

VISITED: Weebubbie, Chowilla Landslip, Abrakurrie.
Snake Pit, Webbs Cave, Witches Cave.

We were fascinated by Witches Cave particularly because of its heavy decoration. There were indications in the caves of heavy rainfall recently. Abrakurrie had 12cm. long sprouts from seeds which had washed in. A small fox had found refuge in Abrakurrie and ran towards the entrance - even though it is not a native animal we thought it would be a cruel death in a cave. In Snake Pit a snake in a coil, partly decayed and a mummified cat in a relaxed pose like a cat spread out by a fire, were of interest.

The 4 of us who went for Easter had a restful bus trip back and arrived Tuesday morning at 7 a.m. in time for work! A great time was had by all.

MEREDITH REARDON.

SOUTHERN FLINDERS

ANZAC Weekend, 82.

PARTY: CEGSA: Bernie Magraith, John MacCormack, Mark Smith (Kram), Terry and Meredith Reardon.

SCS TASMANIA: Phil Jackson.

POTENTIAL SPELEOS Karen Barrow, Anne Parry-Jones. Steven Victory and Dennis Thamm.

CAVES VISITED: Mairs, Clara St. Dora, Mt. Sims, Arcooda Creek, Bandoona

DID YOU KNOW out there in the hum-drum of automatic dishwashers and colour T.V. that poor, unfortunate, fellow human beings may be condemned forever to a lack-lustre existence? These poor, unlearned souls, who, through little or no fault of their own, will continue to wallow in the mire of their ignorance, unaware of the fulfilment that can be obtained only through SPELEOLOGICAL ACTIVITIES. One has only to see the change that occurs in the person, the new sparkle in their eyes, the added spring in their step, upon setting out on their first intrepid caving expedition.

It was in the interest of individuals suffering in this dilemma, as well as for the greater good of society itself that this caving trip was organised. The effect made on the above said individuals was quite evident with an overwhelming majority being converted to caving and its associated activities.

Well, after a rather epic introduction, onward to the trip report.

The trip began rather eventfully on Friday evening, losing half of the party before we even reached Gepps Cross, and then losing them again at the "wrong" pub at Orroroo. Dennis, who had been waiting over an hour for us at the "wrong" pub, was quite relieved to see that we had finally arrived.

After a short stop in Orroroo, in which we were able to partake in some of its traditional hospitality, we made for Johnburg and our first camp.

An early rise on Saturday saw us at the Buckalowie Creek Caves, ready to tackle Clara St. Dora around 9.00 a.m. Lunch was eaten by the entrance of Mairs at midday while setting up the pitch with ladders and ropes. Everybody abseiled into the cave and used the ladders to climb out. Some difficulty was encountered in the climb out by a couple of those inexperienced in laddering, though, no complications arose. It probably would have been of value in trying a smaller pitch beforehand, say at Orroroo cave (9m pitch instead of nearly 20m).

By the time everybody was out of Mairs and the pitch de-rigged, the time was 4.30 p.m. We had to hurry to get across the back-tracks from Bagalowie Station to Mattawarrangala (now called -Halowilena South) before sunset. We reached Mattawarrangala on sunset and were forced to look for a good camp near Mt. Sims Cave in the dark.

Terry and Meredith arrived later on that evening after having spent several hours netting bats near Mattawarrangala. Four bats were netted, 2 each of two different species.

Mt. Sims was entered at 10.00 a.m. Sunday morning, venturing down to the lake and examined the animal scratchings. Terry ducked his head into the water but unfortunately found that the lake didn't go. We had originally intended to look at the Good Friday Caves, however, no-one knew very much about them, and getting out of Mt. Sims at 3.00 p.m. didn't leave a lot of daylight to look for them. Hence, it was decided to give them (?) a miss. Instead, we retired to the camp for a cup of tea, where most of the party stayed for the rest of the afternoon. Dennis and John Mac had a look at Bandoona and Arcooda Creek Caves. Not knowing that Bandoona had already been examined, a you-beaut map was quickly drawn up. Good practice.

Meanwhile, terry traversed the locality surrounding Mt. Sims, discovering "Karst Valley" to the north-east of Mt. Sims and another promising area further south. The features were characterised

by many small collapses and dolines grouped in close proximity. Unfortunately, this area has already been looked at and mapped, so no new discoveries.

Monday morning was spent examining these features before leaving the area to go to Hawker. At Hawker, we parted ways, with some staying for a counter lunch and others returning to Adelaide. A slight detour was made at the Yourambulla rock paintings south of Hawker.

JOHN McCORMACK

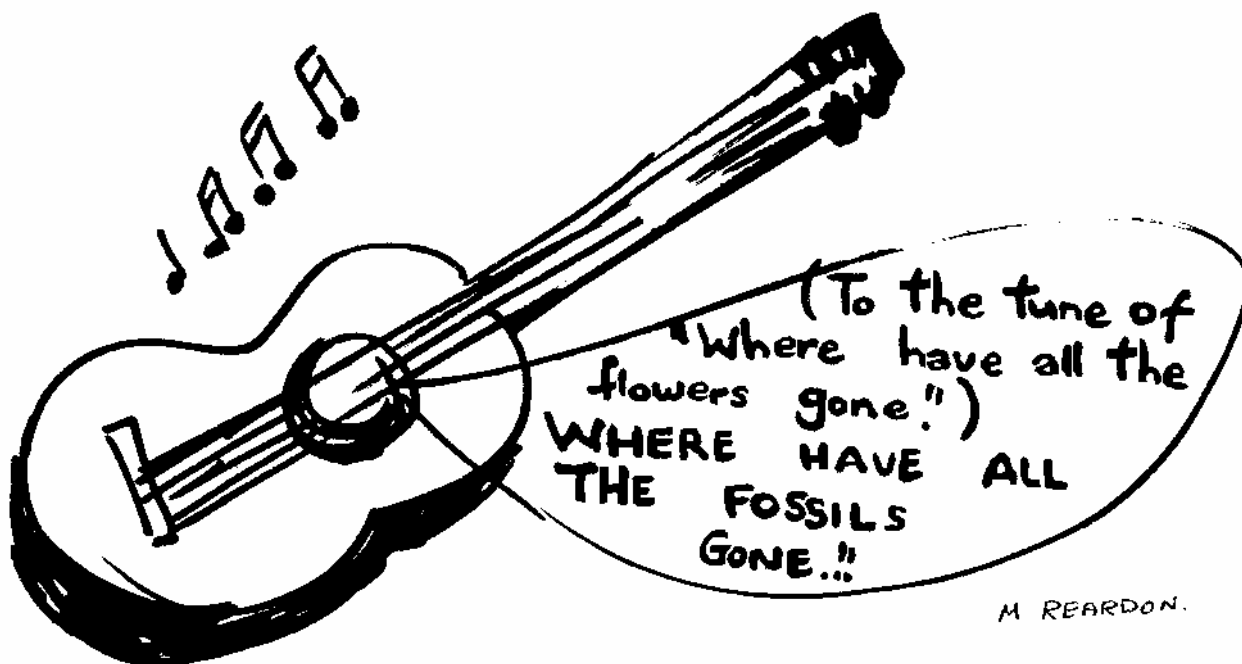
FOOTNOTE:

The telephone numbers of some of the properties have altered since they were last published. The correct numbers are given:-

<u>CAVES</u>	<u>CONTACT</u>	<u>PHONE NUMBER</u>
Mains and) Clara St. Dora)	Bill Turner, Mimburra	(086) 58 1273
Mt. Sims) Good Friday) Arcoota Creek)	David Warwick, Holowilena South	Hawker 125
Oraparinna	National Parks & Wildlife	(086) 48 0001
Orroroo Caravan Park	Mrs. McNamara	(086) 58 1326

CAMPFIRE SINGALONG....

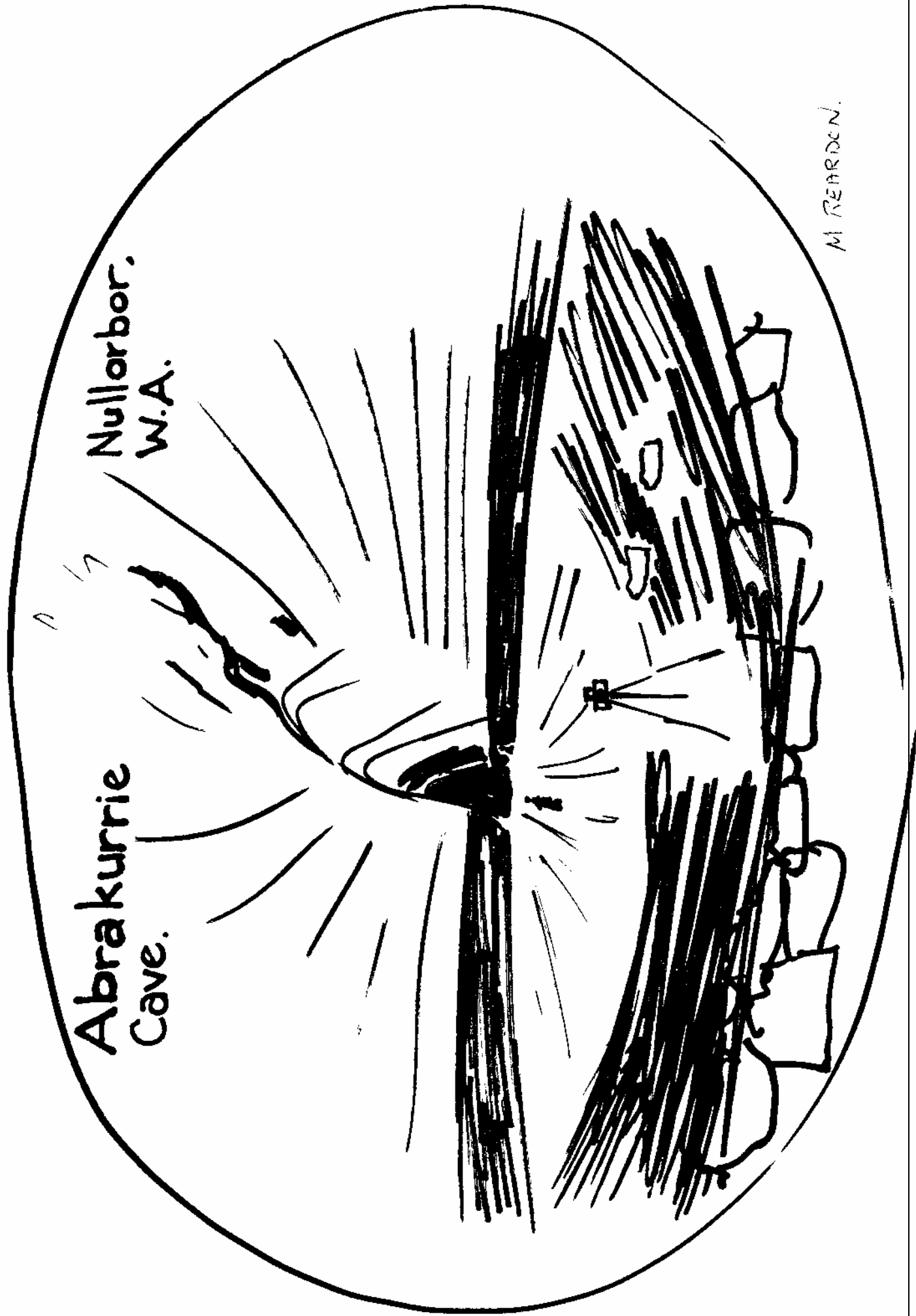
after it was reported that the fossils
were stolen from Victoria Fossil Cave.



Abra kurrie
Cave.

Nullarbor.
W.A.

M REARDEN.



FROM NEIL SMITH – A CAVER IN ANTARTICA

Things are fine down here in the deep South - no caving, however, I've poked my head down a couple of crevasses, very cavelike with straws and shawls, even helictites, all ice. Very beautiful.

Best wishes to all, Neil.

CURRAMULKA

ANZAC Day.

PARTY: G. Ninnes, L. Ninnes, I. Ninnes, K. Ninnes, J. Butto, D. Boseman, L. Boseman and 3 others

This was a one day trip to introduce a few people to caving and to have a quick look at some parts of the cave for those who had never been there.

After arriving at about 11.00 a.m. we had a short trip of 1 hour to see how people would go. One of the best possibilities for a future member was Ian Ninnes - age 2? years. He enjoyed it that much it would have been easier to have had him on a rope as he tried to get into every hole - small, large or vertical - that appeared.

After lunch (B.B.Q. in the rain) 6 of us took a longer trip continuing until those unused to this sort of activity had had enough. Returned to Adelaide early, after a warming session in the pub.

NIMBLE.

TECHNICAL & OTHER ARTICLES

THE SPIRIT OF CAVING

Although unaccustomed to public writing, I was asked to out pen to paper for CEGSA since I was awarded the "Spirit of Caving" Premier Award. (Sorry Kevin, but the ants ate half of it during that hot spell in January. D'you think anyone will notice?).

I appreciated the thought of whoever it was to nominate me for the Award, but must admit to feeling somewhat undeserving. As you might have noticed, I am usually to be seen only at CEGSA meetings, but there is a good reason for this. (Actually, I'm afraid of dry caves).

My excuse lies with the Cave Divers Association of Australia, of which I am a member also. Show me a cave or sinkhole that I haven't seen before and the first thing I'll ask is .. "Does it have any water in it???" If the answer is 'Yes', I'll then proceed to use the standard cunning tactic of getting you to tell me where it is and whether the water is deep enough to dive in. If I know where it is and the answer to the last bit is also a 'Yes', just watch me stand there with my tongue hanging out in anticipation! (I guess you will already be used to this sight from having the same conversations with other cave-divers in CEGSA. I won't name anyone, Ian or Terry!).

My interest in holes in the ground really began many years ago, when I thought that it was great fun to run through (or rather, crawl and grovel through) some 100-year-old mines near Clare, and others here and there. Add the element of water, as in the caves along the shoreline at Second Valley, and you have one budding cave-diver.

By systematically diving and mapping all underground bodies of water, I hope to add to CEGSA records information of some value, along with that which has already been contributed by other cave divers such as Peter Stace and Ian Lewis, etc., who I know are (or were?) members of CEGSA also.

I'm also involved in basic ocean-diving and a few other activities which take up a fair portion of my life, so I'm sorry that I won't be appearing enthusiastically at organised trips away. I can't afford the time or cost!

Anyway, keep up the good work, all you dry cavers, (and fellow cave-divers in CEGSA) and may the Spirit of Caving be with you too. (Just don't bump into it in a long, dark tunnel!).

PETER HORNE.

WATER TUBE LEVELLING

How does one go about determining relative levels in a cave? Traditionally, cave surveyors have used some form of clinometer, but this method, while usually adequate for reducing slant distances to horizontals for plotting a plan view, can give rise to quite large errors in the vertical component. For example, an angle read as 12 degrees instead of 10 would lead to an error of 0.585 metres in relative levels over a 20m leg (but only 0.133m in plan distance). A Suunto clinometer or a miner's dial (vertical circle) could be accurate to perhaps $\frac{1}{2}$ degree, but this would still imply an error of 17 centimetres. Such errors would accumulate rapidly and very little confidence could be attached to the relative levels of widely-spaced stations in a typical horizontal cave system. To top it all off, people often sight to a target such as a caver's helmet light sitting on a rock, and seldom measure accurately the heights of such targets or of the sighting instrument.

A much more accurate method is possible if the miner's dial telescope is equipped with a level bubble. An accurately level sight may then be made to a surveyor's staff at the other end, whose reading gives the relative levels directly. Even better is an automatic level, an instrument which needs only to be roughly levelled by bubble, an internal "pendulum" coming into play to position the optics precisely horizontal. But in the cave situation these methods are fraught with difficulty. The passages may twist, necessitating many short legs for the sake of inter-visibility. Or the roof may be too low to allow the staff to be stood up. Or the tripod. Or the lighting may be too poor for easy reading of the staff.

There is another way. If a long plastic tube almost full of water is open to the atmosphere at both ends, the two water surfaces will assume the same level. In this way, levels may be transferred from place to place in the cave with essentially no more error than that involved in reading the position of the flat part of the water meniscus. The error is no greater over a long leg than a short one, and since inter-visibility is not needed the whole system is satisfyingly immune to squeezes and crawls. The tube may go up and down in between the measuring stations - the middle may be much higher even than the water surfaces; all that is required is that the reduced pressure at the high point does not cause the walls of the tube to collapse or air to come out of solution. It is basically very simple, but several refinements are necessary to make a workable system. This article is to describe recent experience with tube levelling in the Easter Extension of Mullamullang Cave, 6N-37. But a small portion of this enormous cave, the extension would rate as a rather large horizontal system in its own right (at least by Australian standards). Twisting and turning, low and uncomfortable, this cave tested the capabilities of the levelling system to the fullest.

In concept, two bods could just walk through the cave carrying an end of the tube each. Each person would place a thumb over the end to prevent loss of water in the event of the other's holding his end too high while moving. When ready, the two ends would be opened and each operator would make a mark on the wall at the level of the meniscus. Judicious lifting/lowering of the forward

end would place the rear meniscus level with the previous mark, and in this way the level could be carried through the cave with no measuring required. To go up or down there would have to be intervening vertical measurements with a plum-bob and tape. One might just get away with this to run a traverse around the wall of Abrakurrie, say. But what if the wall projects further at the bottom and the plum-bob won't hang straight? Or if you want to go across the middle of a chamber and there's no wall at all? The obvious refinement is to stand a metre rule vertically at each end on the ground and read both scales at the meniscus levels. To get the difference in levels of the two floor points one just subtracts one reading from the other. Since then each operator must carry both the tube and a rule, the last metre at each end of the tube may as well be permanently fixed to the front of the rule with 3 or 4 wire loops. This makes the simultaneous holding-and-reading problem much easier for those of us with only two hands. Of course, the scale should be visible at the side of the tube to avoid having to read it through the curved plastic and the even more curved meniscus, with the attendant refraction and parallax errors.

Now comes the quite interesting point that if the total amount of water in the tube is just such that both rules read 50cm. when placed side-by-side on a level floor, one gets the most flexibility from the system because the two stations can then differ in level by almost a whole metre before one meniscus is forced off-scale. A little playing with a pencil and paper will verify this. And if, further, each operator is equipped with a piece of wood somewhat longer than one metre, with a slot into which the bottom of his metre rule fits so that the rule is effectively extended by exactly a metre, the level difference can be up to two metres. (See diagram). In this way, reasonably long legs can be run in fairly steeply-sloping passages provided that the roof height is sufficient for the extended rule to be stood up. We have found that an extension of more than a metre is virtually never usable, if only because one would need a stepladder (or at least a person with a strong back and shoulders) to be able to read the water level. A scribbled 4-digit number on the top of my helmet reminds me that Dale Arnott once sat on my shoulders in Oasis Valley to read the level when I had the one-metre extender placed on top of a substantial boulder.

Now to the ultimate horror of the tube-leveller's nightmares, bubbles in the tube. Nothing would wreak more havoc to the hydrostatic equilibrium principle than a nice long continuous compressed air bubble. And what would add insult to injury would be finding such a creature hidden down in the folds of the tube halfway through a levelling traverse. With no way of knowing how long it had been there. And the only way to get the damn things out is to keep both ends open to the atmospheric pressure at a nice high point (like up on the house roof) and let the bubbles run upwards from the middle, working towards both ends simultaneously. Just try it any other way! It's extremely hard in a substantially horizontal cave. Bubbles must be prevented at all costs, and to do this while pushing your tube end, metre rule and wooden extender through tight dug crawls with right-angle bends in the middle demands the use of taps. And not just taps at the extreme ends of the tube, because there must be air at each end of the tube, and it must stay there.

The accompanying diagram {THIS WAS NOT IN THE NEWSLETTER} shows our (obvious, I suppose) solution to the bubble management problem. At each end there is a tap just below the lowest loop fixing the tube to the rule. Air is never allowed to enter the barrels of these two taps or the part of the tube between the two. In the extreme ends of the tube, beyond the top of each rule, is another tap. These taps should all be of the multi-turn variety. Those requiring only a 90 °turn from "on" to "off" are too easily knocked. When the operators are crawling, climbing, resting and so forth, all four taps are closed. The section of tube between the two taps at each end contains half air, half water. The water sloshes around at random, but none is lost because of the closed top tap. When both people have reached their stations, each holds his rule vertical and shakes it around a bit so that all water including small drops moves down to the bottom. He then opens the top tap, venting the system to atmospheric pressure. In the next step, the bottom tap is carefully opened while the operator watches the water level. At first the levels at both ends will drop simultaneously as the tap barrels fill up, and then one end will start to rise while the other drops. The operators may, if desired, open their taps in coordinated fashion, but it is not strictly necessary because if at either end the level starts to get alarmingly close to one end of the rule, the operator simply closes the bottom tap again, the person at the other end will immediately know what is going on (and in fact should be taking the exact same action), because with the right amount of water in the system the level at his end will also be approaching the end of the scale. When this happens, and after the taps have been securely closed, the forward operator starts looking for a higher or lower point on which to place his rule, or possibly fits his one metre extender if the roof height allows. Another possibility if the forward station has proven to be too high, is that the other operator tries his extender.

It is at this point that a bit of verbal communication helps, so what we have usually done is to work in teams of three, with a "booker" roving around in between the two tube operators, recording their readings and passing messages. He can also assist the passage of the tube around corners and keep it clear of decoration, etc.

(As an aside, I must apologise to all those female cave surveyors out there for peppering this article with masculine pronouns, and in fact even underlining them. I don't intend to imply any gender - it's just the same old well-known inadequacy of the English language. Oh, well.)

The only other significant feature of our system is the use of small sheet aluminium base-plates (about 10cm square). Every time the forward operator establishes a new station he places a plate on which to stand his rule (or extender). This serves two functions - it prevents the rules digging into any soft floor material such as silt causing the second operator to use a level a few millimetres different from the one the forward operator established. Secondly, the baseplate shows the second operator unambiguously where the station is, so that the booker doesn't have to wait to show him. (This doesn't always work perfectly - the plates are often in quite peculiar positions, down floor holes in rock piles, for example. Thus the booker can, if he keeps on his toes, save a lot of wasted time. The baseplate, however, reduces the reliance on memory enormously.)

It pays for someone to carry a plastic bottle of water just to top up the tube to the right level every now and then, a few drops being lost occasionally through the top tap. This (and all the water in the tube) should ideally be distilled water to reduce the likelihood of any density variations. Topping up one end with high saline cave water is likely to lead to differences in the two levels, as the time taken for diffusion along the tube would be very large.

What can go wrong? The design of the apparatus supposedly ensures that bubbles do not develop, unless something serious happens, like the tube coming off the tap. Even then, quick action can save the day if topping-up water and a funnel are available. Very small bubbles caused by air coming out of solution don't seem to cause any problems - if the water column remains continuous the correct pressure is still transmitted past a tiny bubble adhering to the side. Nevertheless, it adds confidence if occasionally the two ends are stood side-by-side on the same baseplate to check that they read the same. There is the usual hazard common to any surveying, that a number may be wrongly recorded. And so of course the figures should be called loudly and clearly - saying "fiyiv" and "niner" etc - and acknowledged by the booker. One nasty fault is to forget recording the use of the extender. The operator must prefix his reading with a "one" digit in such a case. However, if the traverse is a closed loop such an error should be picked up as a misclosure of almost exactly a metre, and memory may thus be jogged. Much repetitive work may be saved by marking at least some of the stations with permanent metal tags.

It may be thought that, since one end always goes up as the other goes down, the booker could (mentally or otherwise) add the two numbers called (ignoring the whole metres for extenders) and always get the same figure (ideally 100), thus effecting a useful check. This is true to a certain extent, but only fairly gross errors are in practice picked up this way. For one thing, both bottom taps must be opened to the same extent each time so that their barrel capacities remain constant (it helps if operators are instructed to open fully), and for another, there are often trapped drops in the top taps which reduce the total amount read. Interestingly, the walls of the tube expand and contract in response to pressure changed in the water. In a "high pressure" leg (when the middle of the tube goes well below both ends) the checksum can be expected to be quite low, 10cm. or more below the "normal", and the reverse also occurs if the middle goes high. Unfortunately the extenders have no effect on the checksum at all.

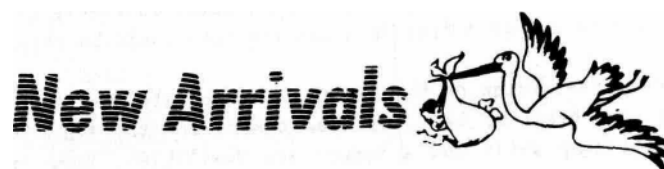
A particularly insidious error is for one operator to forget to open the top tap. The water still seems to do the right thing, one end goes up and the other goes down, but the trapped air at the end either compresses or rarifies, and the two levels don't end up the same (even though the checksum is correct!). It is actually possible to detect this condition by closely watching the behaviour of the moving surface - it slows down too quickly and doesn't oscillate as much as it should - but after say 15 hours in the cave one isn't always attentive enough. So develop a ritual procedure and **NEVER** forget the top tap. (incidentally, the water oscillation is never very much; there is a lot of viscous friction in say 25 metres of 6mm I.D. tubing).

If no serious blunders are made, this method has the potential to be extremely accurate. There should be no difficulty in reading the position of the flat part of the meniscus to the nearest millimetre, so that a maximum error in a single leg of 2mm should still be pessimistic.

Over a long traverse the errors should accumulate as a "one-dimensional random walk", so that the expected error would be of the order of 2mm multiplied by the square root of the number of legs, e.g. 18mm for 80 legs. Even in the (extremely improbable) worst case when all errors added in the same direction, we would have only 160mm for 80 legs, which certainly couldn't be called bad.

There is another possible source of error, which I haven't investigated. Some caves (Mullamullang is one of them) breathe air in and out to a significant extent. This implies that there must be pressure differences in different parts of the cave, and so there could be quite legitimate differences in the water levels at the two ends of the tube. Since atmospheric pressure is approximately equal to that of a water column 10m high, an air pressure differential of only 0.1% would cause a 10mm levelling error. Just how important this effect is I don't know (and, writing this article in Antarctica, I can't immediately place my hands on any books on cave meteorology!). However, it would seem reasonable that if there is no detectable air movement, there would be very little chance of serious error.

NEIL SMITH



Congratulations to Kevin and Julie Mott on the birth of their baby son, Adrien. He is now 11 weeks old and has inherited his Mum's good looks and his Dad's quiet (?) personality.

QUOTE

Whilst supervising a group of 1st Year Students and 3 teachers from Oakbank Area School (20 in all) at the beginning of May, I explained to them how "moon milk" was formed on the walls of a cave. At the end of the explanation my theory was shattered when I overheard one student whispering to another "and it tastes horrible!!"

On the same trip we thought we would let 2 girl students lead the group out. They disappeared into a dead-end passage and after waiting patiently for a few minutes Andrew couldn't contain himself any longer and called out to them ... "You're lost aren't you!" "No", came the reply together with a giggle, "We're not lost, we are EXPLORING!!"

G. PETERSON

OBSERVATION

On a recent visit to Naracoorte I was pleased to note that since some of the pine trees have been removed from above Blanche Cave, a lot of the decorations have become active again.

Proves a theory that there is no such thing as a "dead" cave only "dormant" caves.

PROGRAMME

Members are encouraged to attend Meetings for information on trips and to hear about trips which may not appear on the programme

JUNE

5-6	Naracoorte	G. Ninnes
9	Committee Meeting	
12-13-14	Flinders Ranges – Orraparrina	Stan Flavel
19-20		
23	General Meeting – Vintage Slide Night	Museum Lecture Room
26-27	CEGSA / VSA Dinner	Penola

JULY

3-4		
10-11	Southern Flinders	John McCormack
14	Committee Meeting	
17-18		
24-25		
28	General Meeting – Film – Nullarbor Hideaway	

AUGUST

8	South Coast Adelaide	Kevin Mott
11	Committee Meeting	
14-15		
21-22		
25	General Meeting – Surveying	Kevin Mott
29	Practical Surveying - Morialta	Kevin Mott

ADVANCE NOTICE:

Eyre Peninsula on 4,5,6,7th September (School holidays)

TRIP CONTACT LIST

Gordon (Nimble) Ninnes, 7 St. Georges Street, Glandore 5037	(h)	297 8202
Stan Flavel, Murray Road, Inglewood 5133	(h)	380 5096
	(w)	223 3866
John McCormack, 30 May Street, Sefton Park 5083	(h)	44 2900
	(w)	47 0830
Kevin Mott, 3 Harcourt Road, Payneham 5070	(h)	42 2441
	(w)	227 2704

Please contact the above mentioned names for information regarding forthcoming trips.

ADDITIONS AND ALTERATIONS TO MEMBERSHIP LIST

NEW FULL MEMBERS:

John McCormack	30 May Street, Sefton Park 5083	(h) 44 2900 (w) 47 0830
Kerry Ninnnes	39 Galway Terrace, Kilburn	(h) 44 5727

NEW ASSOCIATE MEMBERS:

Keith Mollet	51 Amber Road, Highbury 5089	(h) 264 2221
Ron Prefontaine	5 Limosa Court, Modbury North 5092	(h) 263 7006 (w) 218 5540
Mark (Kram) Smith	14 Hannay Street, Largs Bay 5016	(h) 297 9975
Dennis Thamm	19 Charlton Drive, Salisbury East 5109	(h) 250 6446 (w) 262 1237
Anthony Whitford	1 Harrow Road, Para Hills West 5096	(h) 250 5223

OTHER ADDRESS CHANGES:

N.B.

Please notify Membership Officer of address and telephone changes

Stan and Kathy Flavel	Murray Road, Inglewood 5133	(h) 380 5096 (w) 223 3866
Peter and Cardine Hill	13 Beamish Street, Werribee Victoria	
Ian Lewis	3/68 LeFevre Terrace, North Adelaide 5006	(h) 267 5917
Steve and Carmel Pahl	C/- Chillagoe Caving Club, Queensland	

NEW PHONE NUMBER:

Peter Horne	Work phone number only – 225 7025 Home phone number as listed in Membership List is invalid
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SPECIAL THANK YOU

A special 'thank you' to Bill Pyecroft, the new Ranger at Naracoorte who returned to the Park at 8.00 p.m. to show the Oakbank Area School students the bats coming out of Bat Cave and the new lighting in Blanche Cave.

NON-FINANCIAL MEMBERS

FULL MEMBERS:

Peter Clarke
Jim Cundy
Peter Hocknell
Ken Johns
Vic Linke
Max Meth
Peter Stace
David Turner

ASSOCIATE MEMBERS:

Ron Allum
Roslyn Clarke
Geoff Ford
Roger Grist
Peter and Caroline Hill
Nicola Lee
Karl and Barb Lengs
Colin McRae
David Measham
Anna Oudienko
Steve and Carmel Pahl
George Parker
Martin Usher
David Wright

MEMBERSHIP FEES ARE AS FOLLOWS:

Full Membership	\$12.50
Associate Membership	\$7.00
Country Membership	\$10.00
Family Membership	\$19.50