



NEWSLETTER

Cave Exploration Group

South Australia Incorporated

C/O SOUTH AUSTRALIAN MUSEUM NORTH TERRACE ADELAIDE

VOL. 21 No. 4
FEBRUARY 1977
Issued Quarterly



SOMEWHERE IN BLACKBERRY CAVE
NARACOORTE, S.A.

C . E . G . S . A . N E W S L E T T E R

VOLUME 21 No: 4 February, 1977

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E D I T O R I A L

Because of the Christmas Holidays, this Editorial is being written early, before Christmas in fact. But because you will not have the pleasure of reading these words until the January meeting, I'll just wish all cavers a Happy New Year with plenty of breezes to entice you on!

In December, about 40 CEGSA members collected at Pat and Tony Lake's place to hold the Annual Dinner. In the past, this activity has been held in either a Hotel or Restaurant, but for a change, Pat suggested this new venue. It was an unqualified success and I have a sneaking feeling I know where the next dinner will be held! After all, the host and hostess have a whole 12 months in which to recover!

Ian's article in this issue makes compelling reading. One can often learn from mistakes and the suggestions made by Ian as a result of these mistakes should be given serious consideration. One mistake, or misjudgement in isolation, can sometimes be overcome, but when by ignorance or inexperience, several are compounded together, as in this instance, the outcome could be disastrous.

It has repeatedly been stated in Annual Reports, S. & R. Reports etc., that in its 21 years of existence, CEGSA has been most fortunate in that no member has ever experienced a serious mishap. But how many more times can we tempt providence? Years ago there used to be what were called training trips for new members. It is about time this system was revived to replace the present laissez faire attitude of allowing new cavers to wander almost at will into caves. The fault lies in ourselves. I do not attach any blame to the three who almost became victims, in fact I thank them for pulling us all up with a jerk and making us realise we have been too easy going for far too long.

Several times in the past I have suggested that we ought to organise an S. & R. exercise in collaboration with the Police. I am convinced we, and the Police, would find the experience most useful. So far this suggestion has not been taken up. Whilst we have all been aroused from our slumbers, can we please try and do something about it? Over to you Kevin; And whilst you are busy organizing this one, what about arranging for some of the Police Rescue Squad to do a spot of caving, as I am sure they would then better appreciate some of our problems, which would make for better liaison in the future. There may come a time when in a real rescue, we would seek underground assistance from the police. If you've tried it, you'll realise stretcher bearing, or using a jackhammer is extremely exhausting underground and it may come to the point of "all hands to the pumps" to save a life.

To conclude on a more mundane note, the supply of good photographs for the front cover is nearly exhausted. The ones I have left can at best be described as indifferent. Remember the reproduction is by stencil, not half tone, so good sharp prints with hard outlines are best, anything with soft blending tones will not reproduce clearly from a stencil. And please don't confine yourself to photographing a stalactite in the Vic! I'd like to see something dramatic from Corra-Lynn, or Sellicks!

This Newsletter is the first one I have edited in the four years I have been doing the job, which does not include a plain, straightforward trip report. However, I am not despondent, because in this issue we have an even rarer bird, a technical article. Athol has gone to great pains to produce an excellent article on the care and maintenance of electric cap lamps and gives details on how to make an effective charger. The circuit diagram is easy to follow, it must be because I have followed it and produced a charger which works! In case you don't know, Athol was the creator of that mighty Wurlitzer of a charger bolted to the wall of the Naracoorte Hut, this appears to be capable of charging several dozen cap lamps simultaneously. It wouldn't surprise me if, before long, someone tries to make toast on it, or dry a pair of overalls, or tune in to the Pick of the Goons, or all three together!

ED. BAILEY

NULLARBOR RECORDS

The S.A. Cave Reference Book (Occasional Paper No. 5) includes a large section on the caves on the Nullarbor Plains -- the first updated list since 1967. You will notice that CEGSA records caves on the W.A. side of the border too, and that in fact most of the caves are found on that side. Since the publishing of O.P. 5 I have added several more caves to the list that are found around the Cook and Ooldea areas along the Railway which were discovered and described by Peter Hawkes some time ago. These are mainly small blowholes:-

- N-183 Shower Floor Blowhole
- N-184 Seismic Blowhole
- N-185 Road Surface Blowhole
- N-186 For The Bird Blowhole
- N-187 Creature Cave
- N-188 Neighbouring Blowhole
- N-189 Geoflex Blowhole
- N-190 Cook New Road Blowhole

There are more to be added when I have collected all the scattered data, and reports still drift in of caves further inland of the Railway line along the S.A. / W.A. Border, which wanders up into the Great Victoria Desert -- hardly the location for a Field Day! Much of Alan Hill's data that was passed to the Group when he died has been sorted and categorised but if there is anyone else who holds or knows of Nullarbor information stashed away under their beds or lining their cupboard shelves, please forward it to me or let me know. And as a general appeal, if anyone sees articles in magazines or the newspapers on any aspects of the Plain, (be it the new road, starling plagues or caves even!) I would be grateful for that type of information as well.

IAN LEWIS

(Nullarbor Caves Recorder)

PUTTING OUR CAVES IN THEIR PERSPECTIVE

One of the things I am becoming increasingly interested in as I grow old (!) is just how far I have to go through one of these dark holes to appreciate their charms. Until CEGSA produced an organized list of its caves (updated), people were losing track of just what caves we had and where they were, let alone being able to tell you much about them. It didn't seem appropriate to include in the Cave Reference Book the current Lengths and Depths, as they will change with time and sometimes rapidly -- such as Blackberry. So I have drawn up a list of our biggest and best caves for interest so we know just how much our poor old knees have to knobble over as our demented minds drive us ever onwards!

It is difficult in some caves to accurately define such absolutes as length and depth without some form of qualification, so I have added short comments where appropriate. For instance, it is certainly inaccurate to list L26/27 Five Corners Cave as No. 10 on the list of the Longest Caves but there is no real way to assess how much further the cave goes as we do not have access to it, although we know that it contains an awful lot! So it may actually be (say) as long as Victoria Cave.

I have also used as my definition of length, that distance of passage which can either be traversed by a caver without going over his path again (an impossibility of course, as you do have to get out sometime) or non-traversable passage that can be seen and estimated accurately. After all, this is part of the cave too. In the Depth section, naturally the sinkholes of the Lower South-East almost entirely clean up the honours and some of these have not even been bottomed yet -- cave diving safety limits prevent it.

As a final note, I have separated the caves on the W.A. side of the Nullarbor into their own category, as strictly speaking they are not South Australian Caves. However the data are interesting.

IAN LEWIS

WESTERN AUSTRALIAN CAVES ON NULLABOR OVER ½ KM LONG

NUMBER	NAME	TOTAL LENGTH (Surveyed or known)	SURVEYED LENGTH ONLY	KNOWN BUT Unmapped	REMARKS
<u>Over ½ kilometre</u>		<u>metres</u>	<u>metres</u>	<u>metres</u>	
6N37	Mullamullang	10036	9936	100	Infinite length unmapped and unexplored
6N48	Cocklebiddy	1800+	450	1350	(guideline) May continue for a great distance
6N2	Weebubbie	1300+	1150	150	(guideline) May continue for considerable distance
6N47	Murra-El-Elevyn	790+	640	150+	Possibility of further passages
6N56	Tommy Graham's	600	520	80	
6N3	Abakurrie	550	550		

SOUTH AUSTRALIA'S LONGEST CAVES 1/12/76.

POSITION NO	NAME	TOTAL LENGTH (Surveyed or known)	SURVEYED LENGTH ONLY	KNOWN BUT Unmapped	REMARKS
<u>Over 1 Kilometre</u>		<u>metres</u>	<u>metres</u>	<u>metres</u>	
1	Y1	Corra-Lynn	5375	5205	170
2	U1	Victoria	3060	2860	200
3.	U16	Sand	2210	2210	--
4.	N4	Koonalda	1540	1360	180 (guideline)
5.	F8	Oraparinna	1500+	1500	? Extends for unknown distance
6.	U22	Fox	1400+	1400	? More passage vaguely known
7.	U8/9	Blackberry	1300+	1000	300 General estimate only
8.	M1	Punyelroo	1200	1120	80
9.	K1	Kelly Hill	1050+	1050	? Extends for considerable distance
10.	L26/27	Five Corners	1000+	940	60 Extends for considerable distance
11.	F5	Arcoota Creek	1000	1000	-- Possibility of some extensions
 <u>Over ½ Kilometre</u>					
12.	L31	Collins	940+	--	? Many passages known General estimate only
13.	U10, 11 U12, 13	Cathedral- Tomato-Stick	880	810	70
14.	U20/42	Smoke-Tortoise	800	800	? Suspect no further passages
15.	L119	Snake Hill	800	800	--
16.	F7	Mt. Sims	665	665	? Suspect no further passages
17.	U15	Beekeepers	660	660	? Suspect no further passages
18.	K11	Frosted Floor	500+	200	250 Additional 50 metres vaguely known about

SOUTH AUSTRALIA'S DEEPEST CAVES 1/12/76.

POSITION NUMBER	NAME	DEPTH (METRES)	COMMENT - DESCRIPTION.
1 L158	The Shaft	105+	Water-filled
2 N1	Warbla	104	94m dry, 10m water
3 N4	Koonalda	101	77m dry, 24m water
4 L163	The Bullock Hole	85+	Water-filled
5 L72	Piccaninnie Pond	75+	Water-filled
6 L46	Kilsby's Hole	70	Water-filled
7 F9	Wooltana	70	Dry
8 L14	Ela Elap	68+	Water-filled
9 L42	(Simpsons) Ten-Eighty	65	Water-filled
10 L47	Black Hole	65	Water-filled
11 L7	(Cone Tree) Wurwurlooloo	63	Water-filled
12 L40	Hells Hole	60	30m dry, 30m water
13 A5	Sellick's Hill	60	Dry
14 F1	Mt. Remarkable Blowhole	50	Dry, shallow pool
15 L9	Little Blue Lake	46	Water-filled
16 L125	McKay's Shaft	43	25m dry, 18m water
17 L66	Hancock's	42	Water-filled
18 L16	Tantanoola Lake	40	30m dry, 10m water
19 L32/33	Benara Sinkhole	40	20m dry, 20m water
20 L8	Goulden's Hole	38	Water-filled
21 Y2	Town Cave	38	33m dry, 5m pools
22 E21	Lake Newland East Sinkhole	35	Dry
23 L11	Allendale Sinkhole	33	Water-filled
24 L64	Bottlebrush Sinkhole	31	20m dry, 11m water

WESTERN AUSTRALIAN DEEPEST CAVES ON NULLARBOR — 1/12/76.

POSITION	NO	NAME	DEPTH (METRES)	COMMENT-DESCRIPTION
1	6N2	Weebubbie	130+	87m dry, 43m water
2	6N37	Mullamullang	125	Dry (very shallow lakes)
3	6N49	Pannikin Plain	120	90m dry, 30m water
4	6N56	Tommy Graham's	110	90m dry, 20m water
5	6N48	Cocklebidy	105	90m dry, 15m water
6	6N45	Winbirra	100	Dry (very shallow lake)
7	6N47	Murra-El-Elevyn	91	Dry (very shallow lake)
8	6N40	Kestrel No. 1	75	Dry
9	6N83	Old Homestead	64	Dry
10	6N3	Abrakurrie	64	Dry
11	6N50	Capstan	62	Dry
12	6N42	Kestrel No. 2	60	Dry
13	6N53	Moonera Tank	60	Dry (very shallow lakes)
14	6N160	Dingo (Dingo Donga)	60	Dry
15	6N70	Firestick	54	Dry

VICTORIA FOSSIL CAVE SEARCH CALLOUT 5/12/76.

On the weekend 4th/5th December, about 15 CEGSA people and 5 "civilians" collected at Naracoorte to assist in some special filming work in Victoria Fossil Cave. The weekend was spent hauling reels of electric flex, floodlights, props and sundries through to the Great Hall and back, while film clips of the action were regularly run off. By the middle of Sunday afternoon most people were finished and had moved out of the cave while the remainder stayed behind to sort out the cables etc. Finally at 5.00 p.m. only Graham Pilkington and myself were left in the cave, working on the bypass tunnel with the jackhammers.

We finished at 6.00 p.m. and went out and found two vehicles on the surface by the entrance instead of one. The extra vehicle belonged to a caver only newly introduced to the Group, and was full of gear that indicated there were still people below. Some quick checking showed that there were 3 people -- Craig Lindley, Linda Whaley and Sophia -- (I'm sorry, I still haven't got your surname!) -- somewhere in the cave, and that they had been underground for 7 hours, far longer than expected and from all available evidence far longer than they intended.

At this stage there were 6 people on the surface, 4 from Adelaide, (Jim Cundy, Dale Arnott, Graham and myself) and Fred and Jan Aslin from Mt. Gambier, who were up for the day. We decided to organise ourselves for a serious search and to arrange for a general callout as the cave is 3 km long, mostly crawling, and not an easy one to search thoroughly in a short time. All we knew was a vague report that they had "gone to the Northwest Passage".

Jan took all the details and drove to Naracoorte to notify the police in person (note: not to give a possible false impression via a phone call, which could have been dismissed as a prank.) Dale was assigned the task of surface co-ordination at the Reserve, and the other 4 formed 2 teams of 2 to do a general search of different sections of the cave. Jim and Fred to the Northwest Passage and Ian and Graham to do the main loop via Great Hall to the Upside Down Chamber.

Just as the first team entered the cave at 7.15 p.m. with first aid kits and chocolate etc., the 3 lost cavers appeared after finally finding their way out, so all the police calls were cancelled. Fortunately we contacted them minutes before the general alert was raised. Happy ending, you say? Perhaps it was, but it should never have arisen in the first place. The following observations explain the situation.

WHERE WERE THEY? Craig had heard from someone that you can get to the Northwest Passage via the Sand Chute in the Fossil Chamber. You can, but you have to navigate about 1 kilometre of maze-like flatteners to do so, and I think that there are only about 2 or 3 people in CEGSA who could actually do it because they've spent a lot of time on Vic Trips thundering around in there. It's like going to Naracoorte from Adelaide via Renmark, and even then on the back roads! What is most alarming is that Graham had only heard from someone in an off-the-cuff way that they had gone to the Northwest Passage -- not via the Sand Chute! This is the section we could have searched last of all, (being in the opposite end of the cave) after spending an estimated 6-8 hours thoroughly checking the central and Northwest sections.

The party had not written anything on the Hut blackboard as to which cave they were going into, and had not told anyone their intentions (anyone in authority, that is) beforehand.

The girl whom Craig had told was actually a "civilian" member of the film crew, although he did not know this, and she had no idea of where they intended going and in fact hadn't even been caving before.

But the solution to this is not so easy. It quickly became obvious to those of us in the Search parties that we wouldn't have known what part of the cave they were in even if they'd indicated on the Hut blackboard that they were in Vic at all. So what we need is:-

1. More specific information on where a Vic Cave party is going.
2. Consultation by that party with someone who knows the cave before going down.
3. A much more adequate blackboard to write this data on (the current one is hopeless).
4. A map of Victoria Fossil Cave in the Hut, so people know what to expect, and also for search teams to consult, preferable painted on the wall to avoid being souvenired.

So much for the caving end. As for the searching side, we learnt several things about S. & R. that needed healthy brushing up.

Firstly the callout list. We soon found out that the "current" list in the hands of the Police Rescue Squad in Adelaide was none other than that written by Bernie Dunn in -- so help me -- 1973. I make no bones about the fact that the 2 Search and Rescue Officers in the following 2 years didn't do a damn thing for this list or anything else of an S. & R. nature. The current S. & R. man has thankfully drawn up a revised and up-to-date list ... but the Police hadn't been sent a copy! Thus there was a fair amount of debate before the search teams went down as to the effectiveness of the list when the Operations Room in Adelaide needs to alert cavers in Adelaide. It was nobody's fault, of course, that most of the Group's experienced cavers were driving home from the weekend and were out of contact. That simply had to wait until they arrived in Adelaide and received the news. (On a lighter note, 2 vehicles had blowouts on the trip back anyway, and wound up running some hours late !!! It never rains but it pours etc.)

Secondly, the need to contact the Police at the first sign of serious trouble. Here I am at fault, since I spent some time during the search preparations jumping up and down in my usual vociferous style saying that we should do a quick preliminary search first before contacting them. BAD. If we spent an hour or may be two doing this, we would have further delayed the time of arrival of fresh cavers from Mt. Gambler or Adelaide and would then look rather silly reporting lost trogs 2 more hours after the event. We would arouse the ire of the Police Force unnecessarily, since by law they control the search operation and any cavers associated with them have to fit in with their trained method of running the show.

Finally, a personal comment from one who has led maybe 50 Naracoorte trips over the last 3 years. Without a doubt this year has been the worst for lost or overdue bods in caves around the Reserve. I'M BLOODY FED UP WITH SPENDING MY NARACOORTE WEEKENDS ORGANISING SEARCHES FOR CAVING ODD BODS WHO DON'T USE THAT BLACK BOARD. I've said so in writing as far back as 1974 that it MUST be used, and I'm saying it again for my own benefit as much as everyone else's. So don't forget it! And as a final note, if you don't know about a cave you intend exploring, ASK SOMEONE WHO DOES!!

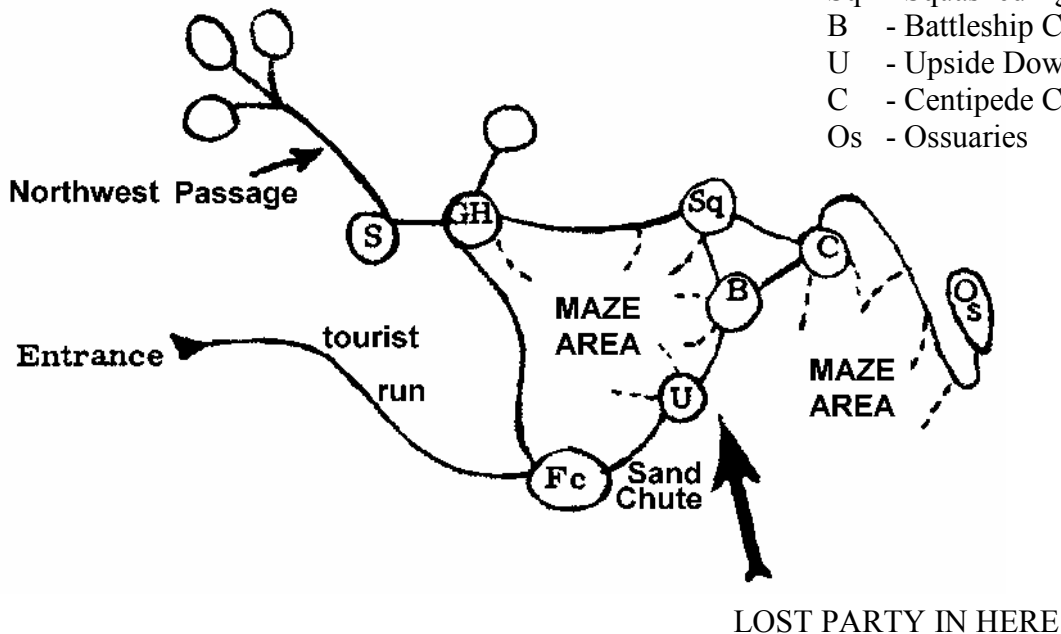
IAN LEWIS

GENERALISED SKETCH OF VICTORIA FOSSIL CAVE.

- NOTE: 1. Cave is 3 kilometres long.
2. Distance between position of party and Northwest Passage!!!

KEY

Fc - Fossil Chamber
GH - Great Hall
S - Strawhaven
Sq - Squashed Egg Chamber
B - Battleship Chamber
U - Upside Down Chamber
C - Centipede Chamber
Os - Ossuaries



NARACOORTE HUT LOG BOOK NO. 1.

Probably at some time or another every caver who has been to Naracoorte has put some form of illiterate scrawl in the Hut Log Book. Well, the current book is the second. The first is presently in my tender loving care being tenderly, lovingly but badly typed. All errors are the fault of the machine, of course.

The first entry in the book is dated 25th-26th May 1957. The first name in the book belongs to -- would you believe? -- Athol Jackson! What a hero.

It is easy to follow the progress of people's pet projects, such as the survey of Sand Cave by Wayne Goedecke and others from 1st Flinders Park Rovers (see -- they aren't all out to totally destroy everything). Or Peter Robertson's fanaticism with Saddle Cave. Every trip he would write -- "Someday it will go", and one day it did. The book is spiced throughout with various pearls of wisdom, proofs of insanity or illustrations of stupidity (whichever you prefer).

One caver was caving because "I like being tortured". Someone else observed that "Group size is inversely proportional to work output". It was also recorded that the Gartrell tribe (Grant, Leslye, then 2 month old daughter Holly and Honey E.) "has been brought to you courtesy of Bullen's Circus. "

Now for a few words on the masochistic occupation of digging

" Going through tight squeezes
Gives mental diseases
From which you may never recover,
But digging them out
Though you are devout
Would put you off caving forever. "

And:

" Dig dig dig dig digdig dig dig chop dig dig scrape dig dig dig dig dig crunch
bang dig dig dig dig dig dig dig dig dig dig dig scrape scratch scrape

This hole was dug out by CEGSA a long time ago and then filled in!! No wonder some people are so hard to get on with -- why didn't you tell me sooner?!! @%£*. Ah well! Dig dig bang scrape

Also:

"We travel 550 miles to be put through the mangle hard bloody work. Gartrell and his mob are mad on digging. We should have learnt last year but we will be back next Easter."

Those who were regulars in the 1975 Survey-the-Vic trips would appreciate the attitude expressed by cavers in 1970 after the discovery of the big extension:-

" Where does it all go !! ? ? "
" What a R-I-I-I-I-I-I-PPER of a cave"
" Queen Victoria would be proud of us"

At this point it should be noted that three years later Ian Lewis is down as saying "After Naracoorte, even Corra-Lynn is grand! "

One caver suggested that Bat Cave be renamed 'Winnie the Pooh Cave', to be abbreviated to 'Pooh Cave'.

Small item which is worthy of interest:

"Survey carried out between Cathedral and Tomato-Stick. Connection made between the two. " -- This entry was in March 1959 ! ! ? ?

Finally an invitation from a completely frustrated conservationist:

"You are all cordially invited to a stalacmite smashing party at Tantanoola Lake Cave at 4 am January 1st, 1896, which should be a real gone swing ding.

P.S. Wear your helmet."

The log book covers 17 years of Naracoorte hut graffiti to the day. The book was retired on 25th May, 1974. And No -- Athol is not the last name in the book!

DALE ARNOTT.

REPORT ON WORK DONE FOR THE
SPELEOLOGICAL RESEARCH FOUNDATION OF AUSTRALIA INC.

The Foundation is in the process of producing, for sale to tourists, a History of the Naracoorte Cave Reserve. This will contain descriptions of the caves open to the public and sections on bats, cave biology, geological features and other relevant information. This publication should be available for sale by the end of February, 1977.

The work done by CEGSA was restricted to photography, a search through its Records and the provision of miniature cave maps (at about 1:2000). Historical photographs have, in the main, come from pre-CEGSA times via various Archives in the State.

In return for these services, the Foundation has agreed to making a monetary payment to CEGSA for the use of any maps, photographs etc. Whether this payment will be a lump sum, or as a royalty on sales, has not yet been decided on. Whatever the form of payment however, CEGSA will retain the copyright to this material.

GRAHAM PILKINGTON

C. E. G. S. A. COLOUR SLIDES

A total of 16 CEGSA colour slides from Victoria Fossil, Blanche, Alexandra and Blackberry Caves are now on sale at the Naracoorte Caves Reserve Kiosk.

The slides have been supplied courtesy of Kevin Mott, Athol Jackson and Ed. Bailey. I wish to thank all who helped on the photographic trips, especially the photographers, including those not listed above, who submitted slides for possible CEGSA use.

It is intended to expand the set of slides indefinitely; the tourists will decide which will be on sale in the future. If anyone considers that they have one or more slides, preferably from the tourist caves but not exclusively, that are possible candidates for the CEGSA slide set, please get them to me.

If anyone wishes to purchase any particular slide or slides (20¢ each to Group members) please ask and I will arrange it.

Another photographic trip has been programmed for early February to Naracoorte and persons interested in attending, to try their skill, learn from others or just to see the caves while they are better illuminated, will be made very welcome.

GRAHAM PILKINGTON
Education Sub-committee

WALLABY SAM, WHO'S HE?

Samuel Davis was his correct name and he was reputed to be the son of a Melbourne Clergyman. He acquired the nickname 'Wallaby' because he was constantly on the 'wallaby' moving from place to place while he prospected, usually for gold.

Sam was peculiar in one respect: he was a confirmed cave dweller. Along the coast or back in the hinterland gullies he enlarged holes under rocks or blocked off larger caves to make a home. His last cave home was in the sea cliffs at Murray Point in Proper Bay, Port Lincoln.

It was a commodious home, about 3m x 4m x 2m high, formed by wind and sea in a soft sandstone overlaid by 2m of hard limestone.

The mouth of the cave was built up and closed off with rocks and dirt and a single door-cum-window framed out of driftwood. At one end of his home he drilled a hole through the roof to act as a chimney for his fire.

Sam lived there for some years until finally taken by police to an institution for the aged in Adelaide where he died about 1900.

Acknowledgements to Roger Haldane and Percy Baillie for excerpts from "Port Lincoln Sketchbook."

J.W. DeGRAAF

REPORT ON WORK DONE FOR THE NATIONAL PARKS & WILDLIFE SERVICE

Two related projects, namely excavating and surveying, have been undertaken by CEGSA for the NPWS in the Victoria Fossil Cave.

The excavation work will provide a pilot tunnel or pathway between the Fossil Chamber and the new exit and this work is in hand. The survey was done to enable the pathway route to be selected and to locate the optimum position of the new exit, and this survey has been completed.

The basic requirement for the pathway route stipulated by N.P.W.S. was that the path shall be negotiable by wheelchair. This meant a slope of 15° (1 in 3.7) would be the maximum at any point. Unfortunately, pathway slope near this figure will be required for over half the total length, which is approximately 200 metres.

Associated with the survey, maps were prepared for the N.P.W.S., this work being relatively easy as most map-work had been completed before the N.P.W.S. request. The maps supplied to N.P.W.S. were an upgraded map based on the 1956 survey which shows the existing tourist section to which was added the new pathway and exit through the Southern Extension, and a map showing all the Victoria Fossil Cave which lies within the Reserve Boundary fence.

Help will still be required on occasions during the next six months or so whilst the new exit and pathway is constructed.

The Committee wishes to thank all those who helped to make these projects successful. Special thanks go to Peter Robertson of V.S.A. for the loan of his Radio Direction Finder, without which the survey work would have been many times more difficult.

The income derived from this work will enable CEGSA to upgrade equipment and to produce new publications without having to incur a deficit as has happened in the past.

GRAHAM PILKINGTON
For the Committee.

CARE AND MAINTENANCE OF LEAD ACID CAP LAMPS.

1. GENERAL. Good reliable lighting is essential underground both for safety and morale. The most reliable and efficient lighting available at this time appears to be the miners Lead Acid cap lamps. Lead acid has many advantages over other types of lighting equipment (electrical): high electrical efficiency, low cost, high power to weight ratio, flat discharge voltage, easy to recharge from car or home power and low electrolyte danger.

Disadvantages are that batteries may be ruined by Sulphation or overcharging. Sulphation occurs when a battery is left for long periods in a discharged state or when a lamp is repeatedly completely discharged without proper recharging. This may be avoided by always storing batteries in a fully charged state and performing a discharge-charge cycle at least once a month. If a battery has been completely discharged it must be completely recharged as soon as possible to avoid sulphate hardening.

Overcharging causes violent discharge of gas and high temperatures within the battery. High rates of gas discharge will dislodge small particles of material from the plates which reduces the efficiency of the plates and also forms a deposit at the bottom of the battery which can eventually short circuit the plates and ruin the battery completely. High temperatures can have a similar effect by buckling the plates and allowing some of the plate material to be lost from the plates with the same disastrous results.

2. CHARGING. From these observations it is obvious that correct charging of Lead Acid batteries is essential. The old method of charging was to apply a constant current of 1 amp to the battery until the voltage reached 4.6 volts and then reduce the current to 0.5 Amp until the voltage reached approx. 5.3 volts and then switch off. It can be seen that this is a rather cumbersome method and is not easy to do at home as it must be attended continually so that the current can be reduced at the correct time. If it is not reduced violent bubbling occurs with the aforementioned results. The system that is now used almost exclusively is the Current Limited Constant Potential method.

A constant voltage of 5 volts is applied through a series current limiting resistor to the battery. The internal resistance of a discharged battery in good condition is approx. 0.2 ohms and its open circuit voltage is very close to 4 volts. Therefore if we use a current limiting resistor of 0.33 ohms then the initial charging current will be approx, 1.8 amps.

$$\text{Current} = \frac{\text{Voltage Drop}}{\text{Resistance}} = \frac{1.0}{(0.33+0.2)} = 1.8 \text{ Amps, approx.}$$

As the voltage of the battery rises with charging, the voltage drop decreases, therefore the current also decreases until the battery voltage rises to 5 volts when the current is approx. 0.1Amps, and the battery is fully charged. The battery may be left on the charger in this condition for several days without any danger of damage even though the battery should be charged in about 12 hours.

A circuit for a suitable charger which can be used from either a 12 volt car battery or 240 volt AC home power is given. If a charger to operate from the car power only is required then only the part of the circuit to the right of the dotted line need be built. The LM 323k Voltage regulator should be mounted on the metal case of the charger so that the heat generated within it may be dissipated. When using the charger with other than Oldhams cap lamps the top of the battery may have to be removed and the charger connected directly to the battery terminals with small alligator clips or some provision made on the battery cover for connecting the charger.

3. GENERAL MAINTENANCE.

(a) Electrolyte: Never add acid to a battery to increase the level, always use distilled water and only fill to the line on Oldhams Type "T" or to the bottom of the holes on other types of batteries. Levels should be checked every 2 months.

3. GENERAL MAINTENANCE. (cont'd)

(b) Terminals: Remove the battery cover and check the condition of the wires and screws that hold the wires to the terminals at least every six months. If the terminals are corroded there may be an acid leak which should be repaired (see reference). Finish by covering the terminals with a smear of Petroleum Jelly and replace the cover.

(c) Cable: Check the cable for cracks or damage, particularly where it enters the battery or lamp. If it shows damage of any kind it should be replaced (use only genuine replacement cable as it is manufactured specially for maximum flexibility without straining the internal wires). Never pick up a battery by the cable as this can strain the wires.

(d) Bulbs: The bulbs used in cap lamps are manufactured to withstand hard knocks so only use correct replacements. Unless a faulty bulb is used a lamp should never fail if the bulb is replaced after about 400 hours or 2 yrs. Care should always be exercised when handling lamps in the off condition as the bulb is most susceptible to mechanical failure then.

(e) Reflectors: Never try to polish the reflector as most lamps have a vacuum deposited metal coating on a plastic backing and this may be rubbed off thus ruining it. If a reflector becomes dirty then wash it with soapy water (not detergent) using a soft camel hair brush and rinse in distilled water afterwards.

(f) Lens: Always keep the lens glass free from dirt and scratches as a thin smear of mud on the glass can reduce the light output as much as 25%.

(g) General: Always keep battery clean as any damage is much more easily seen and can be rectified before complete failure occurs underground. Use low beam as much as possible as on most lamps the discharge time will be twice as long as using high beam. If the battery discharges to the point where it is too dim to see by, switch it off and wait for a half hour when the battery will regenerate enough to give at least another 15 minutes of useful light. (1 hour should give about 40 minutes). This can be repeated several times but with less useable life each time.

4. CONCLUSIONS

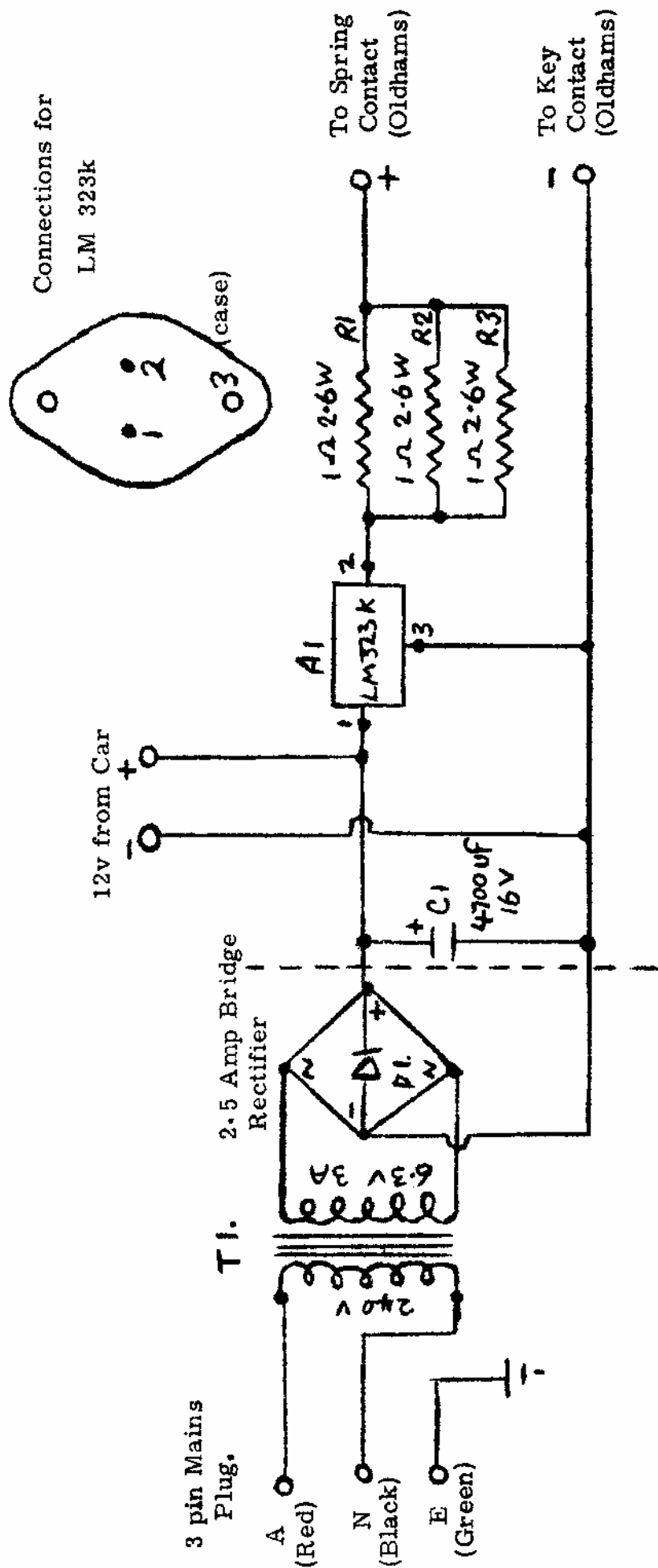
If a Lead Acid Battery Lamp is correctly charged and maintained it should give many years of efficient and reliable lighting under the most arduous conditions of caving activities. I hope that the information in this article will be of some benefit to all cavers.

5. REFERENCES

1. MINSUP Information Bulletin, August 26th, 1969. Instructions for Type "6" Chargers and Oldhams Lamps.
2. MINSUP Information Bulletin, August 20th, 1970. Instructions for use of small chargers, Charging etc.
3. Trans. B.C.R.A. Vol. 1 No. 4. pp. 199-214, December 1974. The characteristics and use of Lead Acid Cap Lamps, by M. F. Cowlshaw.

ATHOL JACKSON

CIRCUIT FOR CURRENT LIMIT CONSTANT POTENTIAL CHARGER.



PARTS LIST.

- T1 - Any Transformer capable of 6.3 V @ 3 Amps output.
D1 - Silicon Rectifier Bridge capable of carrying 2.5 Amps.
C1 - Electrolytic Capacitor 4700 uF 16V working.

A1 - LM 323k 5 Volt Regulator @ 3 Amps.

R1, 2, 3 - Resistor 1Ω wire wound (minimum 2 watts).

Use 23/-0076 Wire for all interconnections

CAVE EXPLORATION GROUP (SOUTH AUSTRALIA) INC.

Programme for February to April, 1977FEBRUARY

Wednesday 9th	Committee Meeting 8.00 p.m.	6 Hudson Avenue, Rostrevor
Wednesday 23rd	Annual General Meeting 8.00 p.m. Museum Lecture Room	Election of officers for 1977
26th – 27th	Curramulka (L) Graham Pilkington	Surveying

MARCH

5th – 6th	Naracoorte (L) Graham Pilkington	Photographic trip
Wednesday 9th	Committee Meeting 8.00 p.m.	****
12th – 13th	Melrose (L) Dot Peisley	Exploration
Wednesday 23rd	General Meeting 8.00 p.m. Museum Lecture Room	Demonstration of Freeze Dried food.
Sunday 27th	Cape Jervis (L) Dot Peisley	Exploration.

APRIL

8th – 11th	Arkaroola, Flinders Ranges (L) Dot Peisley	Exploration.
8th – 11th	Mole Creek, Tasmania (L) Ian Lewis	Exploration.
Wednesday 13th	Committee Meeting 8.00 p.m.	****
23rd – 25th	Glenelg River (L) Graham Pilkington	Exploration
Wednesday 27th	General Meeting 8.00 p.m. Museum Lecture Room	Talk by Police Rescue Squad

**** Venue to be decided by the New Committee

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