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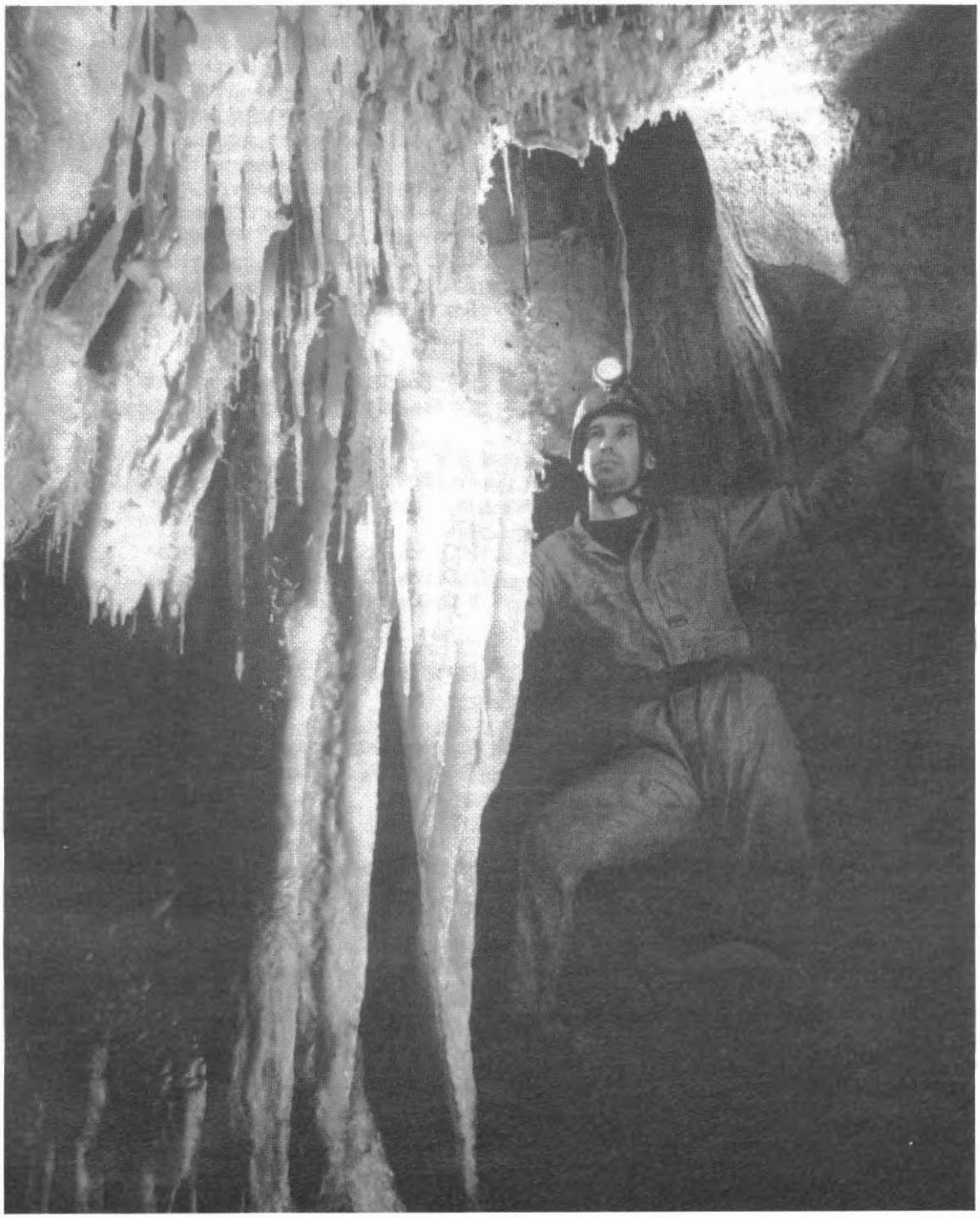

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All articles, reports, tests, photos and reviews are welcomed for publication. These may be sent to:—

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All articles should be submitted to the editor by the end of:—

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If you find writing a chore, why not phone the editor directly???

COVER PHOTOGRAPH

Decoration in Honeycomb (M-41)
by Peter Ackroyd

The DEEPEST AND LONGEST CAVES OF PAPUA NEW GUINEA (December 1985)

R. Michael Bourke

Articles on the greatest caves in Papua New Guinea, as at the end of 1976 and 1980 have previously been published (Bourke, 1977; 1982). Lists of the deepest and longest caves only are updated in this article and are correct as at the end of 1985. Caves with a surveyed depth of 100m or greater and caves with a surveyed length of 1000m or more, are listed in Tables 1 and 2 respectively. Abbreviations used in these tables are given in Table 3.

Several changes can be noted since the previous list was published. The number of caves with depths of 100 metres plus, has increased from 46 to 65 over the past five years. The number of caves with a surveyed length of 1000 metres or longer has increased from 22 to 37. Systematic cave exploration by foreigners, which commenced in 1960, is clearly still in an exponential phase.

The longest surveyed cave in P.N.G. is now Mamo Kananda, in the Muller Range (Table 2). The 1982 Australian expedition extended its length to 54.8km making it the longest cave in the Southern Hemisphere and one of the longest in the world. At 528m deep it is the second deepest in P.N.G. The deepest is Muruk (637m), in the Nakanai Mountains of New Britain (Table 1). It was explored and surveyed by a 1985 French expedition.

With several minor exceptions, all of the changes to the lists since 1980, arise from exploration by expeditions to P.N.G. from other countries. The exceptions are the addition of Berema (120m deep) in Chimbu, which Lex Brown and I explored in 1981, and some corrections to the previous article (Barananomba, Darua Muru, Maig Mur, Oravunana, Pimbiraga Kananda and Uli Ugwa Gitu).

The overseas expeditions that have come to P.N.G. between 1891 and 1985, were an international one to Mt. Kaijende in 1982; the fourth Australasian one to the Muller Range (1982); a Japanese expedition to the Southern Highlands (1983); a British expedition to the Nakanai Mountains of New Britain (1984); and two French expeditions to New Britain in 1985. The Japanese team did not explore any long or deep caves. All of the exploration and documentation of deep and long caves since 1980, have been done by the other five expeditions (except for Berema cave); with Muller 82 and Papov 85, the most successful.

Prior to 1980, most of the deep and long caves in P.N.G. were located in the highlands on the island of New Guinea, although the largest dolines and river caves were on New Britain. There is now a dual concentration in the highlands and on New Britain, following a series of French expeditions to New Britain. About a third of the deepest and longest caves in P.N.G. are now located in the Nakanai Mountains and Whiteman Range of New Britain. Of the deep caves, 8 of the top 11 are on New Britain and 11 of the 16 longest caves are now known from this island.

In the previous articles, information was presented on the longest pitches, the volume of large karst features and underground chambers, the highest caves and the largest underground rivers. This has not been updated because of the lack of published data from the recent expeditions to P.N.G. It can be noted however, that for these five categories, the greatest in P.N.G. are amongst the greatest in the world.

An important exception for which recent data are available, is the volume of Benua Cave on Bougainville Island. This has recently been re-calculated and published by Hans Meier (1982c). Meier calculated the volume of the single chamber cave of Benua as 5 $\pm$ 0.5 million cubic metres. Thus it is one of the largest, if not the largest, underground chambers in the world.

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Hans Meier (Arawa, Bougainville)
Neil Montgomery (Canberra)
Jean Paul Sounier (Nice, France)
John Wyeth (Port Moresby)

Table 1. Deepest Caves in Papua New Guinea

	Cave	Locality	Explorers	Depth (m)	Reference
1.	Muruk	Nakanai Mountains New Britain	Papou 85	637	Anon (1985)
2.	Mamo Kananda	Muller Range, S.H.P.	Atea 78/ Muller 82	528	James et al., (in press)
3.	Bibima	Porol Escarpment, Chimbu Province	PNGCEG 72	494	Wilde and Watson (1973)
4.	Minye	Nakanai Mountains, New Britain	PMSS 68/ FFS 78/ Papou 85	479	Fantoli et al. (1979) Anon (1985)
5.	Gambo	Nakanai Mountains, New Britain	Nare 84	478	D.W. Gill, pers.comm.
6.	Arrakis	Whiteman Range, New Britain	Niugini 85	468	Anon (1985)
7.	KA 11	Nakanai Mountains, New Britain	Swiss 79/ FFS 80	459	Pernette et al. (1981)
8.	Malemuli	Muller Range, S.H.P.	Muller 82	420	James et al. (in press)
9.	Bikpela Vuvu	Nakanai Mountains, New Britain	FFS 80	414	Pernette et al. (1981)
10.	Nare	Nakanai Mountains, New Britain	FFS 78/ FFS 80	400	Pernette et al. (1981)
11.	Kavakuna	Nakanai Mountains, New Britain	FFS 80	394	Pernette et al. (1981)

Table 1. Deepest Caves in Papua New Guinea (continued)

Cave	Locality	Explorers	Depth (m)	Reference
12. Terbil Tem	Fault Valley, W.P.	NG 75	354	Brook (1976)
13. Atea Kananda	Muller Range, S.H.P.	Atea 78/ Muller 82	350	James et al. (in press)
14. Arem Tem	Olsobip, W.P.	NG 78	334	White (1979)
15. Camp 111 Hole	Fault Valley, W.P.	NG 75	330	Brook (1976)
16. Leiwaro Kundu 17	Mt. Kaijende, Enga Prov.	Kaijende 82	330	N. Montgomery, pers.comm.
17. Guimbe	Nakanai Mountains, New Britain	Papou 85	320	Anon (1985)
18. Kananda Heiowa Heia	Muller Range, S.H.P.	1973 NSRE	314	James (1974)
19. Uli Guria	Muller Range, S.H.P.	1973 NSRE	314	James (1974)
20. Liklik Vuvu	Nakanai Mountains, New Britain	FFS 80	288	Pernette et al. (1981)
21. Pavie	" " "	Nare 84	265	D.W. Gill, pers.comm
22. Kille	" " "	" "	260	" " " "
23. Kururu	" " "	Papou 85	256	J.P. Sounier, pers.comm.
24. Luse	Nakanai Mountains, New Britain	FFS 80	224	Pernette et al. (1981)
25. Darua Muru	Porol Escarpment, Chimbu Prov.	PNGCEG 75/ Spanish 78	214	Montserrat and Chavarria (1978)

Table 1. Deepest Caves in Papua New Guinea (continued)

Cave	Locality	Explorers	Depth (m)	Reference
26. KA VI	Nakanai Mountains, New Britain	FFS 80	204	Pernette et al. (1981)
27. Lemerigamis	Lelet Plateau, New Ireland	1976 NISE/ Swiss 79	203	Favre et al. (1982)
28. Ngoma Kananda	Muller Range, S.H.P.	Muller 82	203	James et al. (in press)
29. Langlang Tem	Fault Valley, W.P.	NG 75	200	Brook (1976)
30. Uli Eta Riya	Muller Range, S.H.P.	Atea 78	200	James and Dyson (1980)
31. Uli Mindu	Muller Range, S.H.P.	Muller 82	200	James et al. (in press)
32. Tina Bu Tem	Nong Valley, W.P.	NG 75	198	Brook (1976)
33. Oravunana	Obura, E.H.P.	FFS 78	190	Bourke (in press) Maire & Martinez (1981)
34. Gebemi Tem	Kaban Range, W.P.	NG 78	183	White (1979)
35. Owillfore Tem	Feramin, W.S.P.	NG 75	183	D.Brook (pers.comm.)
36. Kege Mur	Mt. Kege, Chimbu Prov.	Spanish 78	182	Montserrat and Chavarria (1978)
37. Uli Ui	Muller Range, S.H.P.	1973 NSRE	182	James (1974)
38. Gouvi-Bogalawe	Nakanai Mountains, New Britain	Nare 84	172	D.W. Gill (pers.comm.)

Table 1. Deepest Caves in Papua New Guinea (Continued)

Cave	Locality	Explorers	Depth (m)	Reference
39. Agim Tem	Tifalmin area, W.S.P.	NG 75	167	Brook (1976)
40. Doline des Pygmes-Arrakis River	Whiteman Range, New Britain	Niugini 85	161	Anon (1985)
41. The Sting	Hindenburg Range, W.P.	NG 75	158	Brook (1976)
42. Girtoil	" " " "	NG 75	156	Brook (1976)
43. Yunamare	Obura, E.H.P.	PNGCEG 78/ FFS 78	156	Maire and Martinez (1981)
44. Fungi Tem	Mt. Wamtakin, W.S.P.	NG 75	142	Brook (1976)
45. La Buum Tem	Hindenburg Range, W.P.	NG 75	138	Brook (1976)
46. Selminum Tem	" " " " "	NG 75	137	D. Brook (pers.comm)
47. Barananomba	Yonki, E.H.P.	CCC 74/ PNGCEG 78/	134	Bourke (1986) Maire and Martinez (1981)
48. Kara Kundu	Mt. Kaijende area, Enga Prov.	Kaijende 82	131	N. Montgomery (pers.comm)
49. Maig Mur (Mebile)	Duglpagl, Chimbu Prov.	PNGCEG 73/ Spanish 78	131	Monserrat (1982)
50. Black Hole	Muller Range, S.H.P.	Muller 82	130	James et al. (in (in press)
51. Rainbow Hole	" " "	Muller 82	130	J.James (pers.comm)
52. Uli Mulmulum	" " "	1973 NSRE	130	James (1974)
53. Uli Eya Kolo	" " "	Atea 78	124	James & Dyson(1980)
54. Ariyorba Tem	Mt. Wamtakin, W.S.P.	NG 75	122	Brook (1976)

Table 1. Deepest Caves in Papua New Guinea (continued)

Cave	Locality	Explorers	Depth (m)	Reference
55. Askenbu Tem	Olsobip, W.P.	NG 78	120	White (1979)
56. Berema	Porol Escarpment, Chimbu Prov.	PNGCEG 82	120	A.L. Brown (pers.comm)
57. Kukuwa	Kuraro Valley, Bougainville	NSCEG 78	119	Meier (1982b)
58. KA V	Nakanai Mountains, New Britain	FFS 80	113	Pernette et al. (1981)
59. Poypun	" " "	FFS 80	110	Pernette et al. (1981)
60. Vuvu 11	" " "	FFS 80	110	" " "
61. Pelecmatana	" " "	Papou 85	107	Anon (1985)
62. Lowatkusmeri Lemet Silot	Lelet Plateau, New Ireland	1975 NISE	102	Brown et al. (1976)
63. Obungeram	Baining Mountains, New Britain	PNGCEG 75	102	Sprod (1975) J.Farnsworth (pers.comm)
64. Uli Ugwa Gitu	Muller Range, S.H.P.	Atea 78	102	James & Dyson (1980)
65. Toroku Nantaut	Manetai area, Bougainville	NSCEG	100	Meier (1982a)

Table-2. Longest Caves in Papua New Guinea

	Cave	Locality	Explorers	Length (m)	Reference
1.	Mamo Kananda	Muller Range, S.H.P.	Atea 78/ Muller 82/	54,800	James et al. (in press)
2.	Atea Kananda	" " "			
2.	Atea Kananda	" " "	1973 NSRE/ Muller 76/ Atea 78/ Muller 82	34,500	" " "
3.	Selminum Tem	Hindenburg Range, W.P.	NG 75	20,500	Brook (1976)
4.	Arrakis	Whiteman Range, New Britain	Niugini 85	11,030	Anon (1985)
5.	Liklik Vuvu	Nakanai Mountains, New Britain	FFS 80	6,200	Pernette etal.(1981)
6.	Gambo	" " " " "	Nare 84	6,000	D.W. Gill(pers.comm)
7.	Minye	" " " " "	FFS 80/ Papou 85	5,420	Pernette etal.(1981) Anon (1985)
8.	Nare	" " " " "	FFS 80/ Nare 84	4.600	Pernette etal.(1981) Gill (1985)
9.	KA 11	" " " " "	Swiss 79/ FFS 80	3,500	Pernette etal.(1981)
10.	Leiwaro Kundu	Mt. Kaijende area, Enga Prov.	Kaijende 82	3,500	N. Montgomery (pers.comm)
11.	Bikpela Vuvu	Nakanai Mountains, New Britain	FFS 80	3,000	Pernette etal.(1981)
12.	Guimbe	" " " " "	Papou 85	2,770	J.P. Sounier (pers.comm)
13.	Dolines des Pygmes-Arrakis River	Whiteman Range, New Britain	Niugini 85	2,760	Anon (1985)

Table 2. Longest Caves in Papua New Guinea (continued)

Cave	Locality	Explorers	Length (m)	Reference
14. Kururu	Nakanai Mountains, New Britain	Papou 85	2,630	Anon (1985)
15. Pimbiraga Kananda	Muller Range, S.H.P.	Muller 82	2,500	James etal.(in press
16. Pavie	Nakanai Mountains, New Britain	Nare 84	2,250	D.W. Gill (pers.comm)
17. Atea Outflow	Muller Range, S.H.P.	Muller 82	2,200	James et al. (in press)
18. Irukunguai (Irapui)	Porol Escarpment, Chimbu Prov.	GCC 64/ PNGCEG 72	2,120	Wilde (1973)
19. Kananda Heiowa Heia	Muller Range, S.H.P.	1973 NSRE/ Muller 82	2,000 (in press)	James et al.
20. Toroku Nantaut	Manetai area, Bougainville	NSCEG 79	1,900	Meier (1982a)
21. Kavakuna	Nakanai Mountains, New Britain	FFS 80	1,800	Pernette et al. (1981)
22. Tuweiwu (Ikenar/Kipuari)	Obura area, E.H.P.	GCC 64/ PNGCEG 78	1,525	Bourke (in press)
23. Kopunei	Central Manus Island	PNGCEG 74	1,500	Francis (1975)
24. Nenduma	Bougainville Island	NSCEG 75	1,500	Meier (1975)
25. Ok Mi Great	Ok Tedi area, Western Prov.	J. James and others	1,500	J.James, (pers.comm)
26. Lemerigamas	Lelet Plateau, New Ireland	1976 NISE/ Swiss 79	1,300	Favre et al.(1982)

Table 2. Longest Caves in Papua New Guinea (continued)

Cave	Locality	Explorers	Length (m)	Reference
27. Oravunana	Obura area, E.H.P.	FFS 78	1,300	Bourke (1986)
28. Pumpulyun	Central Manus Island	PNGCEG 74	1,250	Francis (1975)
29. Tolana	Nakanai Mountains, New Britain	Papou 85	1,240	Anon (1985)
30. Bibima	Porol Escarpment, Chimbu Prov.	PNGCEG 72	1,220	Wilde & Watson (1973)
31. Dalum	North-east coast, New Ireland	1976 NISE/ Swiss 79	1,200	Favre et al. (1982)
32. Gouvi-Bogalawe	Nakanai Mountains, New Britain	Nare 84	1,200	D.W. Gill (pers.comm
33. Nambawan Ananda	Mt. Kaijende area, Enga Prov.	Kaijende 82	1,200	N. Montgomery (pers.comm)
34. Drai Pasis	Nakanai Mountains, New Britain	Papou 85	1,100	Anon (1985)
35. Barananomba	Yonki area E.H.P.	CCC 74/FFS 78/ PNGCEG 78	1,050	Maire & Martinez (1981); Bourke(1986)
36. Ok Tem (Ok Kaakil Tem Uneibo)	Hindenburg Range W.P.	NG 75	1,040	D.Brook (pers.comm)
37. Surprise River	Mt. Kaijende area, Enga Prov.	Kaijende 82	1,000	N. Montgomery (pers.comm)

Table 3. Abbreviations used in Tables 1 and 2

PMSS	Port Moresby Speleological Society (PNG)
CCC	Coroka Caving Club (PNG) (mostly F. Parker's exploration)
NSCEG	North Solomons Cave Exploration Group (PNG)
PNGCEG	Papua New Guinea Cave Exploration Group (PNG) (Year indicates last major exploration, e.g., PNGCEG 75)
E.H.P.	Eastern Highlands Province
S.H.P.	Southern Highlands Province
W.S.P.	West Sepik Province
W.P.	Western Province
1973 NSRE	1973 Niugini Speleological Research Expedition to the Muller Range (Australian/New Zealand/Papua New Guinea)
NG 75	1975 British Speleological Expedition to Papua New Guinea (British)
1975 NISE	1975 New Ireland Speleological Expedition (Australia/PNG)
1976 NISE	1976 New Ireland Speleological Expedition (Australia/PNG)
Muller 76	1976 Muller Range Expedition (Australia/PNG)
Atea 78	1978 Australasian Muller Range Expedition (Australia/New Zealand/PNG)
NG 78	1978 British Speleological Expedition to Papua New Guinea (British)
FFS 78	Federation Francaise de Speleologie Nouvelle Guinee 78 (French)
Spanish 78	Expedicion Espeleologica Papua-Nueva Guinea 1978 (Spanish)
Swiss 79	Expedition Speleologique Suisse Papouasie Nouvelle-Guinee ete 1979 (Swiss)
FFS 80	Federation Francise de Speleologie Nouvelle Guinee 80 (French)
Kaijende 82	1982 Mount Kaijende Expedition (USA/Switzerland/Australia/England/PNG)
Muller 82	1982 Muller Range Expedition (Australia/New Zealand/PNG)
Nare 84	1984 Nare River Expedition (British)
Papou 85	Federation Francaise de Speleologie New Britain (Nakanai Range) expedition 1985 (French)
Niugini 85	FFS New Britain (Whiteman Range) expedition 1985 (French)

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POSTSCRIPT

The new atlas of the world's greatest caves edited by Paul Courbon and Claude Chabert has just been published. It is a very well presented publication and gives information on the longest and deepest caves from 100 nations. The atlas is an excellent example of international speleological co-operation.

Information in the atlas indicates that the longest cave in P.N.G. (Mamo Kananda - 54.8km) is presently the 15th longest surveyed cave in the world, although it is incorrectly given as the 18th longest in the table of longest caves. It is just 300 metres shorter than Purification system in Mexico, which is the longest outside of the U.S.A. or Europe. Of the 11 large dolines and other surface karst features listed, 7 are located in New Britain including the three largest in the world (Luse, Ora, Minye). The entrance pitch of the Minye doline (417m) is the second greatest pitch in the world after the 450m pitch in Hollenhohle, Austria.

A summary of the 1982 Mt. Kaijende expedition to P.N.G. has just been received (Montgomery et al., 1983). The total surveyed length of Nambawan Ananda is given as 1300m not 1200m as in Table 2 above.

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A REVIEW OF THE LITERATURE ON THE TOXICOLOGY OF FLUOROSCEIN DYE

by ROMAN LICHACZ
Karst Investigation Officer
Hills Speleological Club Ltd.

1). USES

Fluoroscein's major use in the field of speleology is in confirming connections between water bodies in different regions of a cave, surface, and underground waters and to show that different caves and different parts of the same cave are interconnected by the same body of water, and in so doing the underground hydrology can be determined.

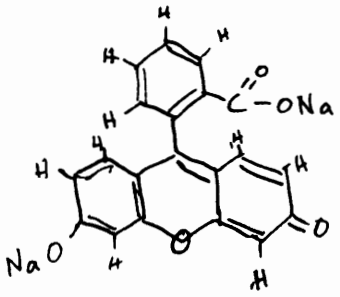
On occasions these tests are done without due care to the effects of fluoroscein on the environment utilising these water bodies. Hence the reason for doing this review on the toxicology of fluoroscein.

Outside of the Speleological interests, the main uses of fluoroscein are for sanitation processes (6) such as tracing flow patterns, flow

rate measurements in sewers and streams, caculating retention times in sewerage settling tanks, tracing contaminated ground water discharges in receiving waters and detecting waste flows of effluent from subsurface disposal fields; in chemistry it is used as an absorption indicator for titrations; in medicine (6) it is used as a diagnostic agent in some opthalmic (eg: as an indicator of corneal trauma) and circulatory conditions and as a dental plaque disclosing agent (5).

2). CHEMISTRY

Fluoroscein sodium has also the following synoym names (11):- soluble fluoroscein, resorcinol phthalein sodium ,uranine, uranine yellow and its IUPAC name of Spiro (iso benzofuran-1 (3H), 9'-(9H) = xanthem) -3-one, 3',6-dihydroxy - (2321-07-5). Its molecular weight is 376.27, with a molecular formula of $C_{20}H_{10}Na_2O_5$ and its molecular structure is:-



It is usually in the form of an orange-red powder, which is hydroscopic, freely soluble in water forming an orange-red solution that fluoresces with a yellowish-green colour. The colour (6) is first detectable at a pH of 4.6 and increases in intensity to a peak at a pH of 8.0. It is perceptible down to 0.02ppm with the naked eye, while spectroscopic techniques will permit it to be detected down to 0.1 to 0.5ppb.

Fluoroscein (6) is easily decomposed by sodium hypochorite or potassium dichromate. Clays and soils have a great ability to absorb considerable quantities of the compound.

3). TOXICOLOGY

(a) Mutagenicity.

Fluoroscein proved not to be mutagenic using the Salmonella/mammalian-microsome test (8) and also by using Bacillus subtilis and Escherishia coli (4). The halogenated derivatives of fluoroscein proved to be mutagenic under the influence of light.

(b) Animal Toxicology.

The experimental LT_{50} (2) (the lethal time for 50% of the population to die) for the house fly, Musca domestica, is 33.8hours. The experimental LC_{50} (7) (the lethal concentration in ppm for 50% of the test fish to die in the specified time) for three types of game fish was found as follows:-

FISH	24 hr	48 hr	96 hr
Rainbow Trout (Salmo gairdner)	4198	3420	1372
Channel Catfish (Ictalurus punctatus)	3828	2826	2267
Bluegill (lepomis Macrochirus)	5000	4898	3433

These results indicate that the dye is relatively non-toxic to these large game fish, if the dye is used in dilute quantities as the dye should be used.

At the same time a study (1) on the sea urchin, Strongylocentrotus purpuratus, gametes showed that fluoroscein rapidly inhibited fertilisation. The ability to block fertilisation is thought to be related to the dye's lipophilicity, making it capable to be absorbed onto the lipophilic regions of the vitelline layer (egg yolk) and/or the plasma membrane of the gametes.

The obtained experimental I_{50} (1) (the ability of the dye to inhibit fertilisation of 50% of the eggs) was found to be 4 millimoles or approximately 1500ppm.

For ordinary mice the LD_{50} (5) (the lethal dose where 50% of the test population dies) was found to be 4738 mg/kg of the mouse's weight. Effects on the mouse included decreased spontaneous motor activity, righting reflex, respiratory rate, ataxia (loss of coordination) and central nervous system depression at higher concentrations.

For rats the LD_{50} (5) was found to be 6721 mg/kg of rat weight. Effects observed on the rats included irritability, decreased spontaneous motor activity, ataxia, piloerection (hair erection) and decreased respiration rate.

The LD_{50} (9) for newborn rats was found to be only 1000 mg/kg of rat, this low value could be attributed to a decrease in biotransformation, renal erection and an increase in the permeability of the blood-brain barrier in newborn rats.

(c) Plant Toxicology.

An extensive study (10) was conducted by Shellini on the effects of low and high concentrations of fluoroscein on the plants African Lemon Marigold (Targetes ereta), Stone's variety of tomato (Lycopericium exculentum), Black Wax Beans (Phaseolus vulgaris), and Crosby's Egyptian variety of beet (Beta vulgaris rubra). At low concentrations the plants grew bigger, larger and would bear more fruit than the control plants, but at high concentrations stunting would occur.

This was at first thought to be due to the photodynamic destruction of auxin (which is formed in the leaves, and is involved in stem elongation and bending), but its explanation didn't explain the plant propogation in low concentrations of fluoroscein.

Further investigation revealed that the fluoroscein was ten to fifty times more concentrated in the ground than in the root xylem, which implies that it doesn't reach the leaves or the top of the plant. If the root system was damaged the fluoroscein would travel to the top of the plant and subsequently die.

So to test whether the effect was photodynamic, tomato plants were kept in the dark and light and with and without fluoroscein, the plants in the dark were fed a 10% sucrose solution to make up for the lack of sugar normally produced by photosynthesis.

In both dark and light specimens treated with fluoroscein the growth was reduced by 60-90% of the control plants. This suggests that the mechanism of inhibition isn't connected with a photodynamic effect.

The growth rate of stems is regulated by auxin (from leaves) and caulocaline (a hormone found in the root). As the same effect is observed in the light and the dark, it can be assumed that fluoroscein is affecting something which is in perpetual darkness in the roots, such as the caulocaline.

The observed increase in growth can only be obtained if all other factors, mineral nutrition, assimilation, auxin are at optimal or at least not limiting in growth.

4) CONCLUSIONS

It is recommended that the halogenated derivatives (which exhibit greater fluoroscein, toxicity and mutagenicity) not be used under any circumstances. In fact fluoroscein shouldn't be used if the water is suspected of draining into a water supply downstream of the test site unless considerable dilution of the compound is first done so that it is visually undetectable or the water is chlorinated before being consumed, even though fluoroscein's toxicity is much less, than its' halogenated derivatives.

Lastly, let me conclude by saying that the indiscriminate use of chemicals which can potentially contaminate the waterways should be avoided, unless there is absolutely no other method available (remember that fluoroscein is absorbed in clay and mud, so that an excess has to be used, and it will leach out for some considerable amount of time), that the results are absolutely necessary and the test should be conducted with due care and attention to the environment utilising the water supply.

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TRAIL MARKING AND AREA DESIGNATION: A STANDARD APPROACH?

by NORMAN POULTER

INTRODUCTION

Reflective signs have been used by several generations of cavers (for various reasons) so what is new about this lot and how can they be used to assist cave conservation. Well, read on.

As cavers become aware of the damage that they and those who come after them can do to the sensitive environment of a cave they try and work out means of minimising or preventing that damage.

This can be attempted in numerous ways such as;

1. permanent closure - not a popular move,
2. restricted access - not very popular either, but acceptable,
   a. number of people allowed in at any one time and,
   b. how often,
3. strict adherance to established, well defined trails,
4. construction of retaining walls, installation of pathways etc.

These innovations have been periodically documented from areas such as Jenolan, Buchan, Leeuwin-Naturaliste Ridge and more recently Tasmania and are usually the result of consideration by a few people in relation to time, materials and people available to carry out particular programs. Somewhere in all that the cave gets considered also.

However, there seems no indication of attempts to standardise the approach of damage prevention or minimisation throughout Australia. It is left mainly to the individuals on site and with what materials are available at that time.

One such approach however, is in the realm of trail marking and area designation - an area that this society has been interested in for some time leading to much experimentation. The current format developed by SRCWA is detailed below.

DESCRIPTION

During the Tasmanian ASF Conference of 1984, Bob Woolhouse of the Northern Caverneers outlined a plan to restore damaged areas of Kubla Khan and take steps to minimise future damage by changing the method of exploring the cave by altering some of the existing tracks and introducing one-way trails. In order to achieve this he required numerous reflective markers - markers that were supplied by SRCWA. Bob was impressed by these markers and made mention of them in his article published recently in the Australian Caver.

These markers were 25mm diameter discs with a 4mm hole in the centre and were produced from damaged road signs, hence the term RRS, Recycled Road Signs.

The signs were 'acquired' from various parts of the country as the opportunity arose and Australia's bad drivers permitted.

As the idea of a standardised trail marking and area designation system formulated, it became evident that this unreliable method of acquisition was no longer tenable. To this end SRCWA approached the Main Roads Dept. of Western Australia for a supply of recyclable signs. The Department was very helpful and allowed us a trailer load of signs, signs that once had a purchase price of $55 each.

Working on a theoretical output of 950 discs per sign we estimate that we have enough signs to yield 1,000,000 discs in the primary colours of white, yellow and red. However, due to damaged sections, black lettering etc., it is further estimated we can realise only half that number - still enough - to supply Australian caving clubs for many years to come - for a small fee thankyou very much.

These discs can be utilised in various ways;

1. using the central hole they can be afixed to walls, rocks, posts etc with nails or screws (fig. 1)
2. rested or glued on or to small ledges,
3. glued to plastic price tags with Silastic (fig. 2) and stuck in cracks, earth floors etc., they can become trail markers and carry information. They then have the ability to be used as permanent survey markers - a useful navigation aid in long or complex passageways.

However, by virtue that various colours are available, the way is now open to establish area designation as well.

AREA DESIGNATION - what is it?

Reflective road signs come in five basic colours and SRGWA proposes that the first three to be utilised in the following manner;

WHITE the most prevalent colour - to be used as route/survey markers.

YELLOW caution/hazard areas.

RED no go areas.

GREEN green sign generally occur on freeways, but for some strange reason do not often get damaged, possibly because they are so large (too easy to hit?). This colour could denote unlimited access?

BLUE blue signs are usually found in country areas and therefore stay there when damaged. The new suburban route number signs have not yet been in place long enough to be attacked by motorists or vandals in sufficient numbers to start appearing on the MRD scrap heap. This colour could be used as a direction change (junction) or other instruction i.e. end of trail.

DISCUSSION

WHITE general route/survey marker

This will be the most numerous disc produced which is just as well as it will most likely be the most widely used. This disc has already been used with success in Kubla Khan (Tas.), The Nullarbor and Leeuwin-Naturaliste Ridge. They stand out in stark contrast to their surroundings and according to Bob Woolhouse appear as crystal faces in photographs. When mounted on plastic price tags (or equivalent) with the ability to carry information, their versatility is greatly expanded.

YELLOW caution/hazard area

Why Yellow? We have been conditioned to recognise amber as caution, so yellow, being similar could denote the same condition. To make the colour more useful, a number 'key' system could be instituted to designate why the discs were put in place.

Such a 'key' could be;

1. unstable area
2. delicate decoration requiring special precautions
3. cave fauna ahead
4. area only to be entered seasonally.

A sub-key function could also be utilised i.e.

1.a unstable area, ceiling

RED no go area

Again we have been conditioned to stop at red and again the colour could be used with a standardised number 'key' such as;

1. passage already explored - no chance of extension
2. scientific area
3. high mortality rate caused to fauna if disturbed
4. no access unless carrying special dirt-free clothing

A sub-key function could be used with this colour as well.

CONCLUSION

This society feels that these discs are more aesthetic than other types of track markers and would be quicker to put in place than custom built signs or markers. Due to standardisation they would be more likely heeded by the general caver.

If a suitable 'key' was formulated then such a key could be published in society magazines and the Australian Caver on a regular basis ie once a year. This key would need to be 'standard' throughout Australia.

Early in 1987, SRGWA intends to go into the production of these discs following construction of a more efficient punch and die set than is currently available. To offset tooling and other associated costs, it is intended to charge 2¢ per disc, plus postage. Larger or custom sizes will be available subjet to negotiation.

It is hoped that there will be widespread acceptance of these reflective discs; our major wild caves have suffered from over-use - especially where poorly designated trails exist.

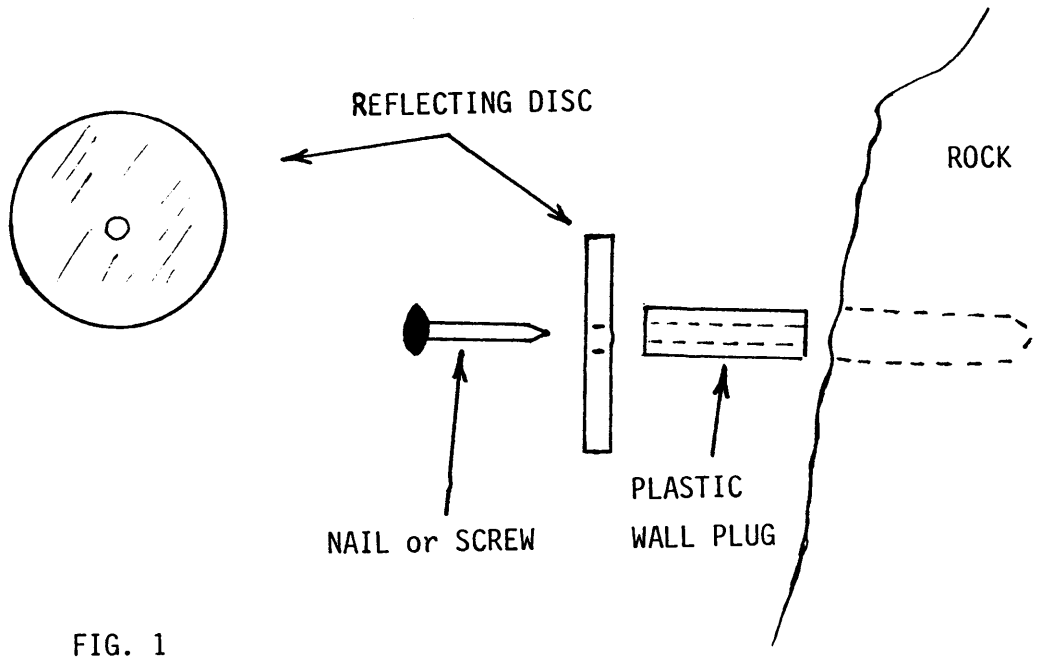


FIG. 1
not to scale

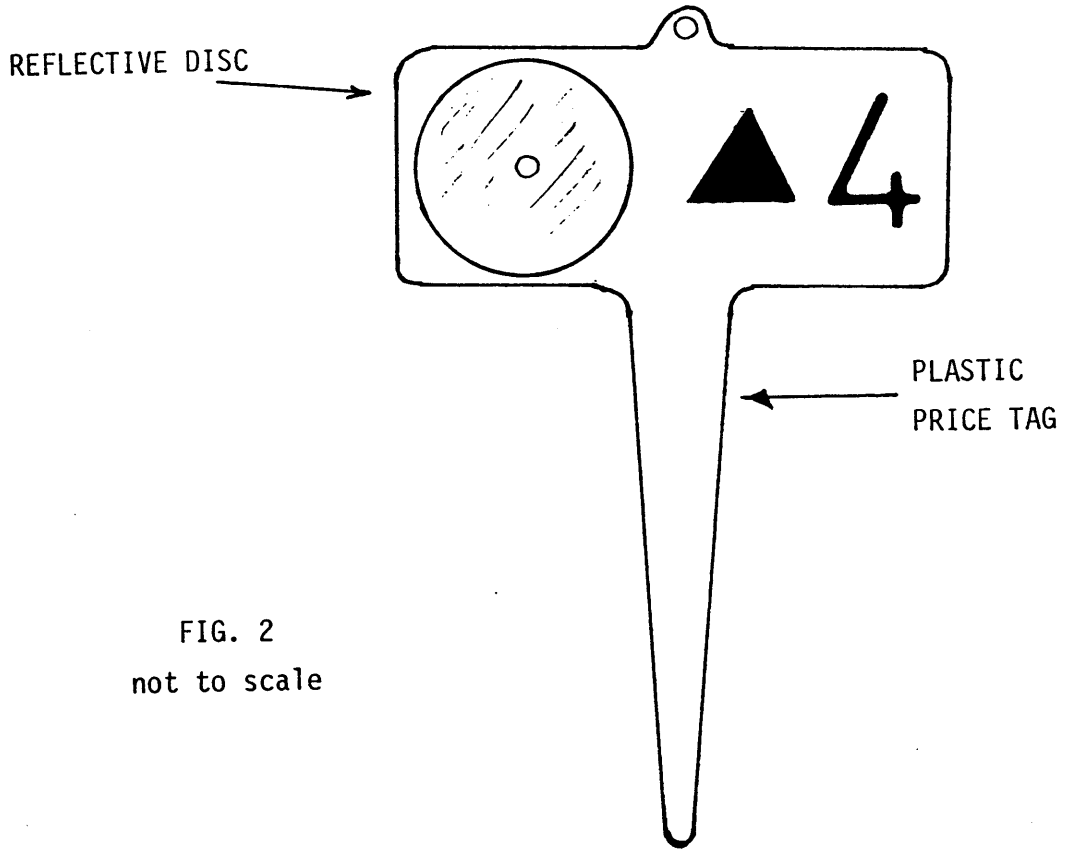


FIG. 2
not to scale

OLD HOMESTEAD CAVE (6N83) DISCOVERIES

by Graham Pilkington

During the last 20 years, only 11km long **Mullamullang Cave** has been the target of dry-caver Nullarbor expeditions - which still continue as "tidy-up" surveying takes place. The discovery of vast new caves or extensions has eluded all. It was only after divers pushed **Cocklebiddy Cave** out past 6km that any other Nullarbor cave exceeded 1.5km.

Now all that is changed with a rejuvinated **Old Homestead Cave.**

At the time the Old Homestead was established, circia 1912?, the South cave was 250m long, 65m deep and the North cave 50m long, 35m deep with an extra 30m doline loop passage. The Homesteaders dug a shaft in the North cave where the water used to pond after heavy rain - presumably on the assumption that a lake was somewhere below like in large caves nearer the coast. They excavated through 5m of solid rock then 3m of cemented rubble. This exposed a hidden chamber along the hanging wall that extended the North cave to 70m long, 50m deep.

The cave then rested in relative peace as the Homestead was abandoned and its location was too far north for inquisitive would-be cavers. In 1955 a log-book was placed in the South cave entrance chamber. It records the very infrequent visits since then and some of the more permanent residents such as dingos. The mention of elephants needs to be taken with a pinch of halite or the more common gypsum.

On the 1st Sept 1984, an unusual event occurred. A group of youths under the care of Neil Montgomery had not heard that you walk into Nullarbor caves, and then walk out again. They had the audacity to deliberately move rocks! In the morning the South cave was extended 370m. However, a third of this is ideal for wombats not people. Not satisfied with this, they then dug the **IMPROBABILITY DRIVE.** This extension, also off the South cave, ran into the **SPRING SERIES.** Two trips of 8 hours each proved the find to be extensive - at least a km in mostly walking tunnels with many going leads.

Hearing rumours, three CEGSA members went out to the cave in Sept 1985 to map and explore it. Only depths of the dolines were recorded in CEGSA Records. The south cave was described as a chamber The 1984 rumours had said the South cave went for kms in 10 by 10m sized passage but a survey only produced 550m. We missed the **IMPROBABILITY DRIVE!** A few unusual features were found.

* South cave ended in an "impenetrable" rockpile which had a "Southerly Buster" type gale.
* A partially lithified bone deposit containing bandicoot lower jaws (now with the SA Museum).
* Although the cave started as a typical "deep" Nullarbor cave, it levelled off at only 60-66m depth in a mixture of collapse domes and phreatic tubes. Water-table is estimated at 130m depth from a 150m surface elevation.

Not wishing CEGSA to be seen as followers, we decided that we would find a North cave extension. Not so easy! Using all our Corra Lynn learnt skills and 5 hours digging out a dirt-filled slot produced a re-arrangement of cave contents and three dusty trogs about to execute a strategic withdrawal. A few minutes later and a small breeze followed some removed dirt. An hour later and the presence of two immoveable rocks prevented further progress. We knew what to do. A contortionist's manoeuvre, head-down with hammer into face and we were late for tea. The cave went down a sloping rock and into a low rocky crawl. After some more rock removal and pathfinding we popped out into a 3m high, 10m diameter rockpile chamber. At the bottom of this, a low sandy grovel led through another collapse and into a sand-floored walking passage 3m high, 5m wide. We stopped at a major T-junction about 80m from our breakthrough. A North cave had been found.

Most of our September trip was spent surveying and exploring the South cave because that cave was the rumoured goer (even if we only located a small part of it!). After one and a half days mapping the North cave and still having found nothing spectacular, our spirits were sagging. The unaccustomed continuous exercize didn't help. Then it happened. Max Meth and I had just called it quits to have an early day (really it was to avoid having to survey **THE MESS** - a complex area of multi-level collapses and tubes) and I had a look round the next corner. This led along the bottom edge of a collapse which became negotiable as I progressed. Suddenly the rocks weren't there. I had got into a 10 × 10m tunnel. Max followed. We raced off following the breeze through low crawls and large chambers. After 500m both of us began to get that healthy feeling that we had gone almost too far. This was a four-level system

with no main passage. Side tunnels larger than the one we were travelling along. A cairn was made to show our farthest point. The stop reassured us into going just that bit farther but now we made out pointers at every major junction. We finally called it quits at a major change of direction (we had been travelling NNW) about 1300m into the cave. This time we were really late for tea!

Next day we did a rough line traverse along the exploration path and pushed on to 2.1km from the entrance. We stopped in a "wrong way" when the passage had gone stuffy and was dividing up into 0.4m sized tunnels. A major side tunnel 400m back had had a breeze and Max had wanted to go that way but I had wanted to keep on at the same compass bearing.

Next trip was at Easter '86. The side tunnel led back nearly parallel to the access tunnel but did not connect. By the end of the trip we had pushed it across a low ridge into the next "valley" and it was still going after 1.3km (3km from the doline The South cave was also broken at the "buster" and after 300m showed only signs of dividing and getting larger.

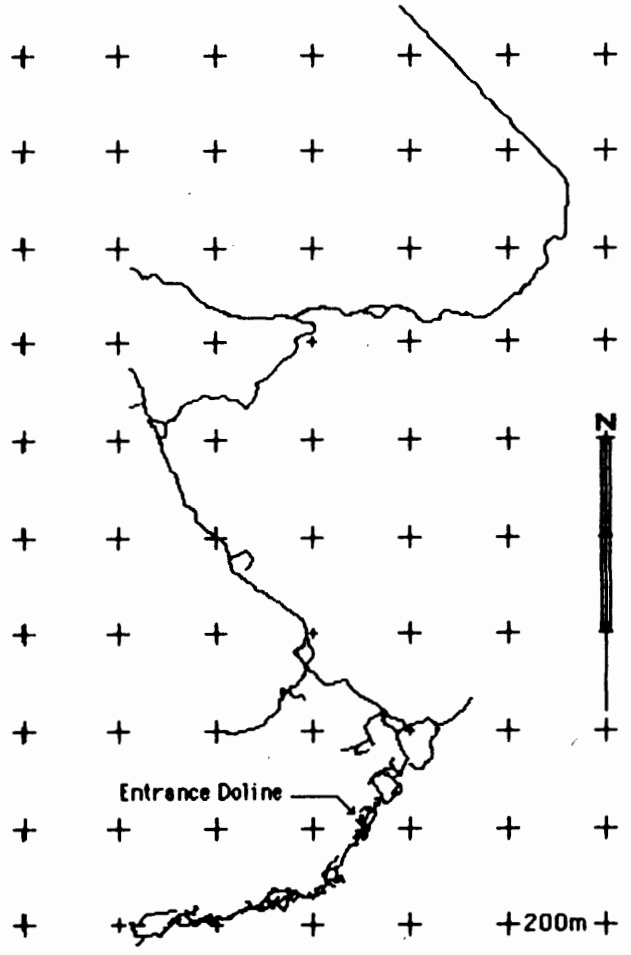
The cave has been found to be a series of Y junctions. Every time a major change in passage trend occurs (at about 300-500m intervals) an alternate limb has been found. This creates the dilemma of an increasing length potential for unfound cave as more passages are found - most caves close down.

Trips are planned to Old Homestead Cave for 4-19th October '86; Easter '87 and August/September '87. We have started a 1:500 scale map sheet series and have established surface and underground control points using Radio-Direction-Finding equipment loaned to us by VSA. CEGSA is pleading for help to survey the cave. Trips by others do not have to be with us, nor coincide with ours, but we would like to have the mapping co-ordinated by us to reduce wasted effort. But be warned. If you are expecting "Mullamullang" style surveys - forget it! This cave is tricky, you need to push into all wall indents and jamb your nose to the end of all passages because they rarely stop.

The premise is that this is the longest cave in Australia. Mapping totals (May'86) comprise 1.5km surveyed, 4km traversed and 2.5km observed. 8km is a good start - it is the second longest on the Nullarbor already. Remember, you too can be in on this unique opportunity, just contact:

Graham Pilkington - CEGSA
66 Eyre Cres., Valley View.
S.A. 5093

OLD HOMESTEAD CAVE - 6N83



Scale 1: 12,500 **as at April 10, 1986**

FAREWELL CAPTAIN J.MAITLAND THOMSON - Some Recollections of a Determined Individual

Over 30 years ago, a small group of young men sat in a theatre at the University of Adelaide, while a stocky grey-moustached figure showed us lantern slides and talked of the wonders of the Nullarbor. Several of us resolved that night that we, too, were going to the Nullarbor Caves, and we did. Some of us still do so, having spent a great deal of that elapsed 30 years in caves.

'The Captain' as he was always known, was a truly remarkable person. A master mariner, descended from a long line of seamen forefathers, he had only become land-locked as the tall ships started to vanish from the oceans - 'if it's got an engine in it, then it's not a ship!' His home was full of the mementos of all those years at sea, and its backyard was a veritable marine museum.

I recall on one of my visits being shown a chart of the Islands of St. Peter and St. Paul. He had sailed there, simply because they were far from any shipping lanes and nobody else seemed to go there. Fascinated by their geology and terrain - peaks of immense submerged volcanic craters, so that each looked deceptively like an atoll - he talked of it as a wonderful place where a man could live in peace.

So, grounded at Ceduna as Harbour Master (and later at Port Lincoln and then Port Adelaide), his ever-active curiosity turned to the hinterland - a long-dead ocean of limestone. He located, entered and explored the caverns which are to this day one of the most wondrous landscapes of Australia. This involved developing his techniques for desert navigation, using a sextant as he would at sea, discovering how to drive in an unerring straight line over hundreds of miles, and sitting aloft on the top o the truck cab searching for breaks in the surface.

His expedition apparently commenced in 1935, following in the footsteps of two other Ceduna residents, Woolf annd Watson, who had made preliminary forays to the already-known caves. Over the years, in company with Harris, the Dunnetts, Knowles, Bechervaise, and others. He discovered and investigated some 160 further caves and blowholes.

One of my regrets was that I was never able to accompany him to the Nullarbor, and that I left Adelaide before getting to know him as well as I would have hoped, but I have vivid memories of those trips which we did do jointly : the Captain's insatiable passion for billy tea, his Tilley Lamp with no glass ('After all, there's not supposed to be any wind down here!') and his rope ladder with its monumentally heavy jarrah treads.

So, we have lost one of the real founding fathers of modern speleology in Australia - not only a pioneer of the Nullarbor Caves, but the first man anywhere to use an aeroplane in the search for caves. He was a true individualist - and like many such, combined the ability to 'go it alone' with the ability to inspire and lead others. His curiosity and sense of determination made him a great explorer - it is a great pity that he missed the rise of modern SRT - he would have loved it. He inspired many of us, and we owe him a great debt.

- Elery Hamilton-Smith

On my first caving expedition to the Nullarbor in 1968, I needed only one look into the beckoning depths of Weebubbie Lake to determine that I would investigate them with diving equipment. In preparing for that diving expedition in 1972, I decided to contact Captain Thomson, sure that somehow the man would be interested in our adventure.

There was no doubt about it! I thought it quite ironic that he should enthuse about our Nullarbor diving with sincere regret that he could not join us, considering that I would have swapped lives with him for a year or two with great enthusiasm. Speaking with a master mariner who had rounded the Horn under sail many times was rather like time travelling. . .

The Captain was indeed fascinated by our findings. On subsequent expeditions he loaned me his home-made magnesium flare : one of a long line of devices dating back to his first expedition with Watson, and a forerunner of the Alan Hill's 'Diprotodon' of the 1960's. It was a beauty - a fire extinguisher cylinder with a pump welded to one side was pumped up to 40p.s.i. (it even had a pressure gauge!) before a release valve blew magnesium power through a 6 inch slot ablaze with methylated spirits.

The result was a blinding sheet of white flame which made short work of photographing the great junction in Koonalda Cave or the entire length of Abrakurrie. The Captain told me that on one calm night on Nullarbor Station, they even used it to light up the landing strip for one of the expedition aircraft. The man's boldness was a wonderful mix of ideas, implemented with characteristic vigour to produce action.

I was extremely fortunate to develop a good friendship with him over the last 15 years, and am deeply saddened by his loss. I think I managed to establish a living link between his caving exploits, long before organised speleology in Australia, and our own modern techniques and discoveries. I am certain this gave him considerable enjoyment, and I feel glad that I was able to bridge the gaps of generation and attitudes.

You see, the Captain was a strong-willed and determined personality, with the expected brilliance and weakness which that brings. Occassionally he would fix me with a hoary eye and state bluntly that 'women have no place in caving' or 'those marine museum types are only out to pillage my photos - can't trust any of them'.

To demonstrate the latter, he refused to hand over to the museum trust the 45 foot ship's mast which had lived in his back yard for 40 years. Finally, he chopped it down and burned it just to ensure that they could not win the argument. My instincts cheered (aren't all speleos somehow rebellious?) even though my head disagreed. We regularly argued briskly about such matters, finally agreeing to disagree. That example may indeed sum up the man. His last few months were spent resisting the hospitalisation and confinement which was expected and inevitable.

His wife Erna must be acknowledged as the anchoring force in his life, and her pride in his achievements and her knowledge of many of those are deep. She made me welcome on a recent visit and we spoke for hours about him. She is a woman whose friendship I value.

A final thought : The Captain gave many slide talks to clubs and groups about the Nullarbor expeditions, and in his last decade he added five new slides to the sequence - a map of the underwater sections of Weebubbie and a few cave diving shots. I appreciated this great sign of respect from one pioneer to a latter group of pioneers. After all, Thomson had already seen that great sump decades before, leaning over the stern of a wooden dinghy, lowered and carried down to the lake, and gazing beneath the water through an improvised facemask. We were just his followers.

- Ian Lewis.

LETTER

Dear Editor,
I would like to point out that Speleomania has (as always) two Co-convenors, not one Convenor as shown in previous issues of the Australian Caver.

They are Stuart Nicholas (address as in Australian Caver) and Philip Jackson, whose address is 4 FACY STREET, BELLERIVE, TASMANIA, 7018.

Yours sincerely
Philip Jackson
(Co-convenor)

SPELEOTEC '87

1. T.Shirts are still available in either yellow with black print or dark blue with white print. Cost is $8 each including postage. Sizes Adults only 12-22.

2. The Proceeding is well under way and will be published in June. If you require a copy please order them now. There will be a limited number of copies available and they will be sold on the basis of 'first in, first get'. Cost is $15 per copy, including postage.

If you require either of the above items, please send money and relevant information to Speleotec '87, C/o 28 Stephen Street, Lawson, 2783. Don't forget your T.Shirt size and colour.

Finally I would like to thank all the helpers and participants who came to Speleotec '87. If you couldn't make it, I say to you start planning your holidays now for 'Tropicon', which promises to be bigger and better.

NOTES ON THE A.S.F. Inc Meeting Monday 5th January 1987

Present: C.S.S., C.T.C.C., B.C.A., B.M.S.C.*., E.C. & R.C.*., H.C.G., H.S.C.*, I.S.S., K.S.S., M.U.C.G., M.S.S., N.&.H.V.S.S., N.S.W.I.T.S.S., O.S.S., R.A.N.C.A., S.U.S.S.*, U.N.S.W.S.S., C.Q.S.S., U.Q.S.S., N.C., V.S.A., S.R.G.W.A., W.A.S.G..
Associates Present: C.C.O.G., C.C.C., C.R.G.

Apologies: E. Hamilton-Smith, A. Spate, K. Mott, M.Pierce.

Proxies: C.E.G.S.A.* - D. Hobbs
S.C.S. - Peter Ackroyd
* - unfinancial, * - paid for less than 10 members.

The meeting started at 9.51am at the Union at Macquarie University.
The minutes of the last meeting were read and matters arising were:-
Apology from M. Armstrong & K. Bennett to be added to last year's minutes.
N.U.C.C. have not attended the last three meetings. There was some discussion and a motion was passed that we write to N.U.C.C. and inform them that their membership had lapsed.
The minutes of the last meeting were then accepted.

REPORTS:

Presidents:-
There is very poor communication between cavers. Mike Armstrong resigned with regret and a vote of thanks was moved from the floor.

Vice Presidents:-
A. Spate Report received. He will not be standing for any ASF Inc. position except Librarian.
I. Mann Report, deferred to Saturday session.

Treasurer's:-
A number of clubs were unfinancial and we are owed about $1,000 by clubs.
I.U.S. subscription should be reduced from category A to category B. This will reduce our annual subscription from US$200 to US$100 with no real change in our I.U.S. status, as we are now classed as a smaller country, not a large one.
Report to Corporate Affairs is difficult due to nearness of closing date to the end of the calendar year and closing of ASF Inc. books. In future, the process of reporting to Corporate Affairs will be streamlined.

Commissions:-
Administration Commission: Miles Pierce will continue as convenor and the report accepted.

Awards: Lloyd Robinson. Report received. ASF clubs response was poor. No tangible award is presented for Fellow of ASF Inc. (our highest award). The Eddie Smith is up to date except for one award. The prize, a photo, is missing. The matter is in hand. The report was accepted.
Cave Diving: Ron Allum's. Report was received and recommendations were made for cave diving policy.

Microcomputer Developments: Terry O'Leary. This report was not intended for this meeting but to the executive and was read by the chairman to the ASF Inc. Committee. The report recommended three options, none of which will be taken due to lack of funds.

Ad Hoc Committee:-
Karst Database Policy: Peter Dykes Database should have a state basis with a system set up on microprocessors and controlled by state co-ordinators. Proposal to make Peter Matthews more accountable for funds he controls.
If data used for any work 20% of any fee charged should be returned to ASF Inc. (10%) and to the people who supplied the original data.
Some discussion occured and the matter was deferred to discussion by an informal group to be continued at the Saturday meeting.

Commission:-
Cave Documentation: Peter Matthews Sales have been reasonable and Dave Smith was particularly helpful with despatch of the Karst Index. Peter was appointed International Convenor of I.U.S. Information Committee. Peter also wishes to start a pilot project for transferring Karst Index data to local microcomputers and eventually a micro based version of the Karst Database. The report was accepted and discussion of the report occurred. An audited financial statement was also presented.

The meeting closed at 12.00 noon.

* * * * * * * * *

NOTES ON THE A.S.F. Inc Meeting Saturday 10th January 1987

This meeting was a continuation of the meeting that was held on Monday the 5th of January 1987 at Macquarie University.
Changes in status of delegates from Monday was:-

Kevin Mott arrived to represent C.E.G.S.A. and they became financial.
S.U.S.S. had now become financial
H.S.C. had now become financial
N.U.C.C. arrived and were represented.

The meeting started at 9.21am in the Sports Union at Macquarie University.

COMMISSIONS:-
Cave Diving Ron Allum. Report was received and it was recommended that the C.D.A.A. become the authority on cave diving in Australia as was concluded at the A.S.F. Melbourne meeting. The recommendations of the C.D.A.A. were accepted as a draft document.

Cave Tourism & Mgmt Elery Hamilton-Smith. Report was received and reported on the 7th Australasian Conference on Cave Tourism and Management to be held in May 1987. The New Zealand delegates have put forward a proposal for this commission to become independent of A.S.F. Inc. This will be an item raised at the May Conference. The report was accepted.
The meeting decided that A.S.F. retain an interest in this commission, yet encourage it to become more independent.

Bibliography Gregory Middleton. No report received

Library Andrew Spate. The current system with the National Library does have a problem. We currently lack a collection in a unitary form and the National Library does not retain foreign language journals. Discussions have taken place with the Defence Force Academy with the view of holding our materials as a complete collection. The report was accepted. Amotion was passed "That the librarian continue his negotiations with the Defence Force Academy or other suitable bodies, with the view to setting up a speleological library and any materials that the National Library hold be transferred to that collection if possible."

International Relations John Dunkley. A report was presented and accepted and the I.U.S conference in Spain in 1986 reported on. The conference to be held in Hungary in 1989, was recommended.

Newsletter Editor Kerrie Bennett. A verbal report was given on the current status of the Australian Caver. Articles are published as soon as possible and constructive criticism is welcomed, but not whinging. The report was accepted.

Newsletter Manager Ian Mann. A verbal report was given. The cost of the newsletter was high and must be born by members as advertising income is insignificant. The report was accepted.
There was discussion about finances and yet again computers. The free distribution list is to be reviewed at a local level and possibility at an international level.
The 100th issue is not yet completed. A motion was discussed to abandon this issue and the material to be returned to the Newsletter Manager.

Survey & Mapping Standards Ken Grimes. A report was presented. Most of Ken's time has been spent on computer applications of surveys and the A.S.F. Inc. computer users group.

Karst Database Policy Peter Dykes. Ken Grimes gave a report of the discussion group that was undertaken on Monday.

Cave Safety Judith Bateman. A report was received. Terry O'Leary was elected new convenor.

Awards Lloyd Robinson. What physical Awards we give to Fellows, besides the honour. Hand drawn Certificates, silver tray and cut glass were suggested.
Andrew Spate was elected a Fellow of A.S.F. Inc. unanimously.

Conservation Rauleigh Webb, Pat Larkin. A report was presented and accepted. The Eastern part of Australia was handled by Pat and Western part by Rauleigh. A film to help the Mt. Etna cause be done at a cost of about $20,000 and finance be sought.
Tax deductible donations may be made to A.S.F. through A.C.F. for a 5% fee for a conservation campaign.
Conservation commission have some funds transferred to its account and information on Mt. Etna be distributed to conservation groups. That A.S.F. make Mt. Etna its major conservation issue for 1987. A motion that $200 be made available to the conservation commission campaign from the Special Projects Account.
The Nullarbor has now commercial cave tours and the company called Osprey Wildlife Expeditions is running tours and so far they seem responsible.
The problem of cave location knowledge becoming widespread in the future, is so far the major problem envisioned on the Nullarbor.

Broader contact should be maintained with other conservation groups, especially with regards to Karst issues.
Kubla Khan cave was discussed and its preservation project was reported on. The lack of internal communication was a problem.
A motion was passed to ask the Tasmanian Government to initiate a management plan for Kubla Khan.
Jenolan was discussed and a motion passed to attempt to ensure the protection of the watershed of the Jenolan Caves.

AD HOC COMMITTEES:-

Beginners Manual Mike Armstrong. A report was presented. Mike then resigned and a vote of thanks was unanimously passed. Peter Stewart indicated an interest in the position and was elected convenor

Jenolan World Heritage Nomination John Dunkley. A report was presented, which recommended that this committee continue at least until a management plan for Jenolan was prepared.

Insurance Scott MacFarlane. A detailed report was presented that included several quotations and various options from a club based insurance, to a national scheme.
The club based scheme was generally the preferred scheme, as clubs associated with tertiary institutions are already covered by their institutions and incorporated clubs already have insurance.
This reduced the numbers significantly for a national scheme.

National Estate Nick White. A report was received and the committee was wound up.

Publications Evalt Crabb. A report was presented and concluded that there was no material for publicaation from Speleohandbook 11 and the committee was wound up. Evalt Crabb will review all A.S.F. Inc. guidelines in the near future.

Nibicon John Dunkley. Reported that there was 234 pages of material that will be archived, monies to be placed in special purposes account.

Cave Convict Philip Mackey, account to finalised.

Speleomania Stuart Nicholas. No report received.

Speleotec '87 Ian Mann. The Conference has financially broken even.

Tropicon Chris Parr. The Conference is going ahead and will run from 27th Dec. 1988 to 30th Dec. 1988 at Tinnaroo Falls North Queensland. With pre and post conference trips to Mt. Etna and Chillagoe and maybe even the Palmer River.

Individual Membership Elery Hamilton-Smith. A report was presented and the required constitutional changes were voted on and approved.

CONVENORS OF STATE SPELEOLOGICAL COUNCILS

N.S.W. Speleological Council Evalt Crabb. Presented a detailed report that was accepted. The proposed tender for the plan of management for Jenolan will soon be released. A.S.F. Inc. should show a strong interest in this plan of management.

GENERAL BUSINESS

A motion from V.S.A. was put that the President, Secretary and Treasurer shall not have proxies, or be delegates. The motion was lost. This was due to six abstentions and five against (two of these votes opposing the motion were from the secretary, who represents two societies), thirteen societies voted for the motion.
A motion was put forward for major structural alterations in A.S.F. Inc., including constitutional changes, aims and by-laws to be done by a committee and the executive draw up its terms of reference. The motion was passed.

Rover Speleological Society of New South Wales, applied for associate status, but have yet to get permission of the Scout Association of N.S.W. Associate status was granted.

A motion was put that clubs interested in insurance contact Scott MacFarlane, before the 28th February 1987. The motion was passed.

Motions were put, that all reports be circulated well before the council meeting, at least 3 months before the meeting and recommendations of 2 months. At least 70 copies of all material to the secretary.
A motion was passed that the Commercial cave tours problem, be referred to the Cave Management & Tourism Commission.

ELECTIONS

President - Lloyd Robinson.

Vice Presidents - Ian Mann (1yr).
- Kevin Mott (2yr).
- Chris Parr (2yr).

BUDGET

The financial year of ASF Inc. will now end on the 30th September.
A motion was passed that all ASF Inc. clubs be strongly urged to pay capitation fees for all members including associates.

The fees for 1987 will be $8.00

The fees for 1988 will be $12.00 with a $1.00 discount for fees before 30th June 1988.
A motion was passed that a late fee of $30 per club be charged for fees received after 30th Sept.
That associates fees for 1987 will be $25 and for 1988 for $30.
The individual membership fees will be $4.00 above the capitation fee.
A vote of thanks to the organisers of Speleotec'87.

The meeting closed at 5.55pm.

DOWN UNDER ALL OVER

VSA:

1986 was the year of the quiet achiever for VSA. Quite a large number of small trips spread VSA members far and wide. The tour de force of Lloyd Mill and Brendan Ferrari in Europe takes some beating. Lloyd is yet to reveal all on the Barcelona stuff-ups (although Nargun readers are just about to get the full report), but in the meantime managed to go caving in most of eastern, central and northern Europe before enjoying the quiet delights of Catalonia. Lloyd was able to tell us a lot about the state of the caving arts and sciences in eastern Europe, where it seems he was warmly welcomed. A slide night or two seems to have been mandatory, so a few of us on our way to Europe this year are now hurriedly sorting slide collections to take with us.

Peter Ackroyd, our indefatigable Secretary, has had a number of projects going during the year, of which the most major seems to have been continual blasting in Stirling's Cave, M-130. Apart from his gargantuan attempt to create his own cave, Peter and his hardy crew have had to put up with high CO2 levels, with up to 5.5% being measured. On one occasion, conditions were so bad that Colin Moloney half way up the entrance pitch, took off his helmet, discreetly vomited into it, and handed it down to those below to look after! Full marks go to the strong stomachs of those at the base of the pitch.

The M-100 survey was extended another 20m in depth under high CO2 conditions, in a year not particularly noteworthy for the quantity of surveying done.

The sump in Dukes's Cave was dived, with 18m penetration in zero visibility, and a new sump in Whale Cave extended for 14m in very tight passage with zero visibility, both by Peter Ackroyd.

In August, VSA bid farewell to Alan Costigan, Superintendent of the Caves Reserve at Buchan for the past ten years. An excellent night was had at the Willow Cottage Restaurant in Buchan, which is highly recommended for the more up-market caver. Alan was presented with a copy of the Karst Index, a fitting tribute to a man who was generally sympathetic and helpful towards caves. One of Alan's last projects in the Caves Reserve was to institute a decoration-renewal program. This was based on pumping calcite-saturated water from Duke's Cave back into Royal Cave and allowing it to flow over the gours in the 'Font of the Gods'. Some degradation of decoration has been noticed in Royal Cave, with what appears to be spontaneous breakdown of the flowstone in many areas. Alex Kariko was able to borrow some meteorological instruments which enabled full instrumentation of the tourist caves to be carried out over the busy Easter period. The results showed significant micrometeorological effects when the gate was opened and as parties passed through.

Also at Easter, the annual VSA trip to Tasmania plunged southward. Through hail and sleet and rain and baggage handlers' strikes we got through. The original plan was for the Cracroft. Only one problem; to get there entailed a walk down Farmhouse Creek, where the forces of light and the forces of darkness were engaged in mortal combat over the morality of logging. Discretion was deemed the better part of valour; we went to Ida Bay. Peter Ackroyd went to the Junee-Florentine with Stuart Nicholas and others. A photography trip was completed in Growling Swallet, where Peter and Stuart were joined by members of TCC who had retreated from Serendipity for embarrassing reasons.

Meanwhile Ida Bay, a slightly less heavy caving team of Daryl Carr, Ken Hosking, Malcolm Fankhauser, Mike McBain, Miles Pierce Bru Randall (NSS & VSA), Barry Russell, Barbara Schomer (NSS & VSA), Peter Stewart John Webb and Lou Williams prepared to attack Marble Hill. Peter, John, Mike and Ken tackled Milk Run (IB-38), while the others visited Exit Cave (IB-14). The rigging of Milk Run, an almost entirely vertical cave, was made relatively simple because of a number of bolts expertly placed by Tom Porritt and others. Some novel rigging techniques were adopted, of which John's antics of lassooing a stal while standing on Ken's knee was probably the most bizarre.

Meanwhile, near Exit, two new entrances were found which promised the possibility of an alternative means of entry under high water conditions.

The next day, roles reversed, with the Exit team going to derig Milk Run, while the Milk Run Crew slept in. On the Monday, Lou Williams had a hard time with a runaway rack

on a pitch in Midnight Hole. A rope protector stopped him from running away to the bottom of the pitch.

In August, Peter Stewart led a group to Naracoorte, where one member of the party had to be rescued from a tree. In October, a veritable cavefest was joined at Old Homestead Cave (N83) on the Nullarbor. From the VSA, we had Nick and Sue White and family, Ken Boland (also a member of WASGA), Rudi Frank and Mike McBain. Max Meth represented CEGSA, while NSW was represented by Graeme Pattison and Patrick Dibben (UNSWSS), among others. As has now become the norm, it rained, it shone and the wind blew the whole time. When the campsite wasn't 2 inches deep in water, it was being buffeted by fifty-knot wind gusts. Rudi Frank's tent was torn to shreds, and a number of others were blown down by the strong winds. Extended surveying trips were led into both north and south caves from the impressive collapse doline. Max Meth ran very tight, dedicated surveying trips and clocked up considerable high grade legs. Much time was spent in search of Neil Montgomery's "missing miles". The search for mysteriously surveyed passages resulted in a trip out to Forrest and a phone call to the somewhat unco-operative Mr. Montgomery in Sydney. The final consensus was a) either the map was a mirror image of reality, in which case we had mapped that section; or b) some of Neil's students had just pulled his leg off at the hip. A lot of time was wasted looking for passages which we now believe do not exist (are you getting this, Neil?). On the surface, when we weren't drying out the campsite or repairing tents, Graeme conducted quite a successful experiment with VLF radio communication from the surface. However, there was some interference which we attributed to certain military installations near North West Cape. The less technologically minded flew kites.

On the way back to Victoria, stops were made at Abrakurrie, Chowilla and Weebubbie Caves for the usual kind of tourist activities, including a most welcome dip in the water.

Just prior to the ASF conference, several people accompanied Peter Ackroyd to Yarrangobilly, while a true family atmosphere was in evidence at Buchan when the Pierce, Williams, and Van Dyk families livened up events. Trips were organised into several of the more sporting caves in the area, including Scrubby Creek and Trog Dip (led by Lou Williams), New Guinea (led by John Webb and Leonie Wyle), and exploration in the Pyramids and Basin areas. Quite a number of new faces were present; the club seems to be experiencing a small but steady influx of new and enthusiastic members, who may in time match the energy of some of our greyer luminaries.

Michael McBain

TROPICON '88

Planning is well under way for next year's conference. A very good venue has been booked, the youth camp at Lake Tinnaroo, located about an hour and a half west of Cairns. This should be a little cooler than the humid coast, as well as offering a variety of water sports for those not attending the Conference (underwater speleosports for divers?). The venue is compact, and inexpensive even by caving standards.

The Conference does not have a specific theme, therefore there should be no excuse for not presenting a paper. Categories for the photo competition will be announced shortly so that you can start clicking away. In addition a video tape section will be included in the competition, consisting of videos on any caving subject of 5-10 minutes duration.

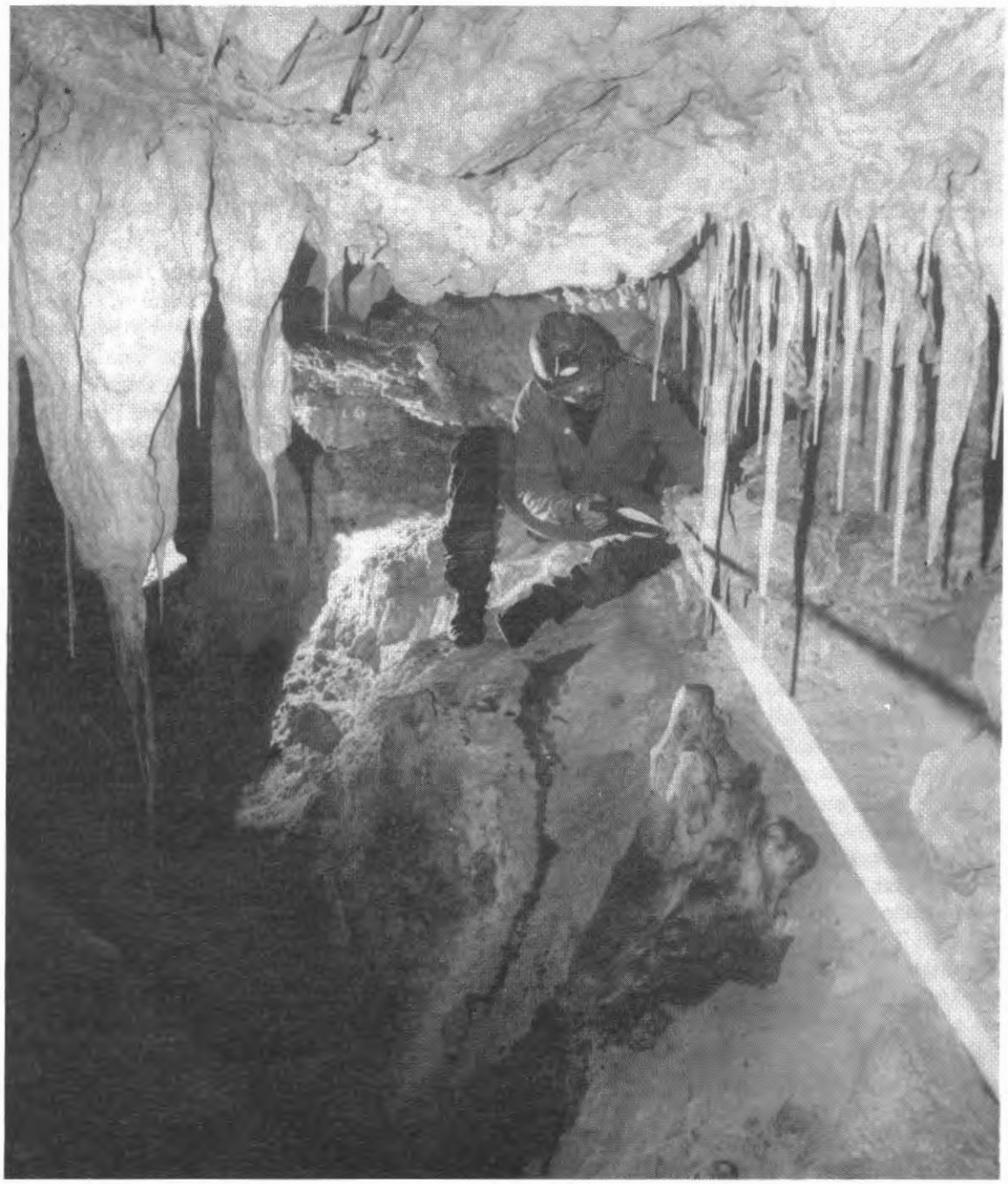
The cavers of Brisbane and Rockhampton will be organizing pre-conference trips to Mt. Etna for people travelling up the East Coast. It may be your last and only chance to see the bat flight from Bat Cleft. Most of the post-conference trips will be at Chillagoe, approximately 2 hours drive west of the conference site. Native guides will give tours of a whose-who of Chillagoe caves, however, there will be ample opportunity for exploring for new caves. Please bring a hat as it will be hot. For those interested in lave tubes, the Undarra system is about 4 hours drive to the south west.

As well as caving trips pre- and post-conference, trips to the Barrier Reef will be organized. These will give you an idea of what Chillagoe was like 400 million years ago.

At Speleotech, Tropicon generated a lot of interest including one intrepid group who intend to come via the Kimberley's! Now that will be some trip to the conference. Andrew Robson of UQSS is also working on the idea of hiring a bus from Brisbane to Cairns.

This is the first of a series of articles on Tropicon. If you have any special requests or suggestions, please write to: Tropicon, c/- Chillagoe Caving Club (Inc.), P.O. Box 92, Cairns 4870. Remember that car stickers and helmet badges are for sale - see our add for further details.

CHRIS PARR



Surveying in Y-160, Yarrangobilly by Peter Ackroyd

WANTED: BODIES FOR THE CHRISTMAS ISLAND EXPEDITION

- AUGUST 1987 -

Four to five more people are required for the Christmas Island Expedition.
This expedition is under the patronage of Sir Ninian Stephen. It will be running for all of August 1987.
Scuba divers would be welcome to come along.
The approximate cost from Sydney will be $1800.
If you are interested contact:

Rauleigh Webb. Ph: (09) 3867782 (H)
(09) 3865568 (W)

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