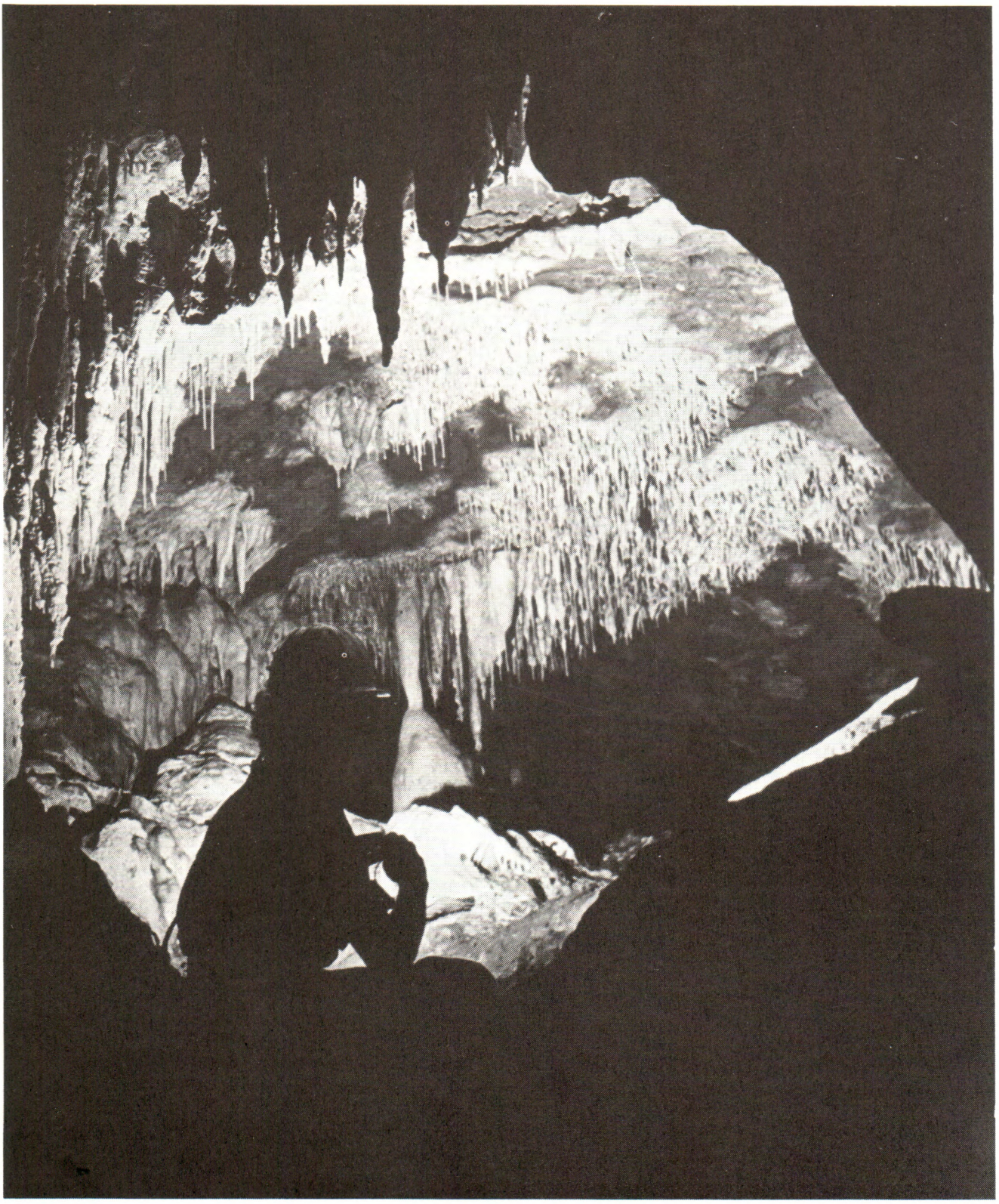
ASF NEWSLETTER
SPRING, 1981, No. 93



Straw Palace, Limestone Ridge, Qld. — Photo: Glenn Pure

THE AUSTRALIAN SPELEOLOGICAL QUARTERLY

Registered by Australia Post Publication number TBHO484 X

AUSTRALIAN SPELEOLOGICAL FEDERATION
P.O. BOX 388
Broadway N.S.W. 2007

ISSN. 0313 — 413 X

50c.
Recommended

EXECUTIVE OFFICERS & MEMBER SOCIETIES

Please write direct to the Officer concerned, as the P.O. Box is only a clearing address

Trustees	J. N. JENNINGS	4 Hobbs St., O'Connor A.C.T. 2601
	B. P. MOORE	16 Lambert St., Lyneham, A.C.T. 2603

EXECUTIVE COMMITTEE OFFICERS :

President	KEN LANCE	37 Armagh St., Victoria Park, W.A. 6100
Vice President	ANDREW PAVEY	45 Arcadia St., Glebe, N.S.W. 2037
	GLENN PURE	8 Teague St., Indooroopilly, Qld., 4068
	JIM CUNDY	Coomandook, S.A. 5261
Secretary	PETER RADCLIFFE	42 Priestley Avenue, Point Clare, N.S.W. 2251
Assistant Secretary	CATHIE ROTHERY	5/59 Oxford Street, Epping, N.S.W. 2121
Treasurer	JOHN TAYLOR	P.O. Box 52, Glen Innes, N.S.W., 2370

CONVENORS OF COMMISSIONS :

Bibliography	GREGORY MIDDLETON	P.O. Box 269, Sandy Bay, Tas. 7005
Biological	ELERY HAMILTON-SMITH	P.O. Box 36, Carlton South, Vic. 3053
Cave Safety	GRAY WILSON	16 Newsom St., Ascot Vale, Vic. 3032
Speleo Handbook	PETER MATTHEWS	66 Frogmore Crescent, Park Orchards, Vic. 3114
International Relations	ELERY HAMILTON-SMITH	Address — as above
	JOHN DUNKLEY	3 Stops Place, Chifley, A.C.T. 2606
Library	ANDREW SPATE	1 Hoskins St., Hall, A.C.T. 2618
Longest & Deepest Caves	ROSS ELLIS	11 Arkana St., Telopea, N.S.W. 2117
Newsletter — Editor	ROSIE SHANNON	44 McCaul Street, Taringa Qld., 4068
Newsletter — Manager	TONY CULBERG	P.O. Box 36, Lindisfarne, Tas., 7015
Conservation	LEX BROWN	C/- School of Environmental Studies, Griffith Uni., Nathan, Qld., 4111
Cave Tourism and Management	ELERY HAMILTON-SMITH	P.O. Box 36 Carlton South, Vic. 3053
	ROY SKINNER	12 Baker St., Lenah Valley, Tas. 7008
Membership	BEN NURSE	11 Nelson Parade, Hunters Hill, N.S.W. 2110
	ANDREW PAVEY	45 Arcadia Rd., Glebe, N.S.W. 2037
Survey Standards	BRUCE WELCH	C/- 108 Queens Parade, East Newport, N.S.W. 2106
"Australian Speleology"	ANDREW PAVEY	45 Arcadia Road, Glebe N.S.W. 2037

CONVENORS OF AD HOC COMMITTEES :

Publications	ANTHONY CULBERG	Address as above
Cave Documentation	PETER MATTHEWS	66 Frogmore Crescent Park Orchards Vic., 3114
Membership	BENJAMIN NURSE	11 Nelson Parade, Hunters Hill, N.S.W. 2110
Nibicon	ANDREW PAVEY	As above
Cavconact	BOB NICOLL	C/- BMR, P.O. Box 378 Canberra City 2600
Waccon	KEN LANCE	P.O. Box 151, Nedlands, W.A. 6009
Cave Convict	PHILIP MACKEY	3 Nowa Court Frankston, Vic., 3199

CONVENORS OF STATE SPELEOLOGICAL COUNCILS :

N.S.W.	IAN BOGG	29 Scott St., Springwood, N.S.W. 2777

COMMITTEE MEMBERS :

(a) VOTING MEMBERS

A.C.T. :	
CANBERRA SPELEOLOGICAL SOCIETY	18 Arabana St., Aranda, ACT 2614
CAPITAL TERRITORY CAVING CLUB	P.O. Box 638, Woden, ACT 2606
NATIONAL UNIVERSITY CAVING CLUB	C/- Sports Union, Australian National University, 2600
N.S.W.	
BAPTIST CAVING ASSOCIATION	P.O. Box 140 Greenacre, N.S.W. 2190
BLUE MOUNTAINS SPELEOLOGICAL CLUB	P.O. Box 37, Glenbrook, N.S.W. 2773
HIGHLAND CAVING GROUP	P.O. Box 154, Liverpool, N.S.W. 2170
ILLAWARRA SPELEOLOGICAL SOCIETY	P.O. Box 94 Unanderra, N.S.W. 2526
KEMPSEY SPELEOLOGICAL SOCIETY	2 Albert St., Kempsey, N.S.W. 2440
MACQUARIE UNI. SPELEO INVESTIGATION GROUP	C/- Sports Assn. Macquarie Uni. Nth. Ryde N.S.W. 2113
METROPOLITAN SPELEOLOGICAL SOCIETY	P.O. Box 2, Crows Nest, N.S.W. 2065
N.S.W. INSTITUTE OF TECHNOLOGY SPELEOLOGICAL SOC.	C/- The Union, P.O. Box 123, Broadway, N.S.W. 2007
ORANGE SPELEOLOGICAL SOCIETY	P.O. Box 752, Orange, N.S.W. 2800
SYDNEY SPELEOLOGICAL SOCIETY	P.O. Box 198, Broadway, N.S.W. 2007
SYDNEY UNIVERSITY SPELEO. SOCIETY	Box 35, The Union, Sydney Uni., N.S.W. 2006
UNI. OF N.S.W. SPELEOLOGICAL SOCIETY	Box 17, The Union, Uni. of N.S.W., Kensington, N.S.W. 2033
QUEENSLAND :	
CENTRAL Q'LAND SPELEO. SOCIETY	P.O. Box 538, Rockhampton, Qld. 4700
UNI. OF QLD. SPELEOLOGICAL SOCIETY	The Union, Uni. of Q'land, St. Lucia, Qld. 4067
SOUTH AUSTRALIA :	
CAVE EXPLORATION GROUP (Sth. Australia) Inc.	C/- South Aust. Museum, Nth Terrace, Adelaide, S.A. 5000
TASMANIA :	
NORTHERN CAVERNEERS	P.O. Box 315, Launceston, Tas. 7250
SOUTHERN CAVING SOCIETY	P.O. Box 121, Moonah, Tas. 7009
TASMANIAN CAVERNEERING CLUB	P.O. Box 416, Sandy Bay, Tas. 7005
VICTORIA :	
VICTORIAN SPELEO ASSOCIATION	G.P.O. Box 5425 CC, Melbourne, Vic. 3001
WESTERN AUSTRALIA :	
SPELEOLOGICAL RESEARCH GROUP, W.A.	P.O. Box 120, Nedlands, W.A. 6009
WESTERN AUSTRALIA SPELEOLOGICAL GROUP	P.O. Box 67, Nedlands, W.A. 6009
(b) **ASSOCIATES :**	
AVONDALE SPELEOLOGICAL SOCIETY	Avondale College, Cooranbong, N.S.W. 2265
BERMAGUI SPELEOLOGICAL ASSOCIATION	P.O. Box 16, Bermagui Sth., N.S.W. 2547
CAMPBELLTOWN CAVING & OUTDOOR GROUP	P.O. Box 281, Campbelltown, N.S.W. 2560
CHILLAGOE CAVING CLUB	7 Martyn St., Cairns, Qld. 4870
HILLS SPELEOLOGY CLUB	P.O. Box 198 Baulkham Hills, N.S.W. 2153
MOUNT ISA CAVING CLUB	76 Pelican St., Mount Isa, Qld 4825
ROYAL AUSTRALIAN NAVY CAVING ASSOCIATION	C/- School of Chemistry, Sydnet Uni., Sydney N.S.W. 2006
NORTH QLD. SPELEOLOGICAL ASSOCIATION	1 Boden St., Edgehill, Qld., 4870
PAPUA NEW GUINEA EXPLORATION GROUP	C/- M. Pound, P.O. Box 3824, Port Moresby, P.N.G.

ASF NEWSLETTER
SPRING, 1981, No. 93

**** - * - * - ****

EDITORIAL

Rumour has it that there are caves and cavers on the mainland. Difficult to believe when one sees the Tasmanian origin and inspiration of the copy for this and the next *Newsletter*. Apart from copy asked for as reprints from other journals, copy from and about Tasmania seems easier to come by.

For this reason, I feel that the scope and direction planned for the Adelaide Conference in 1982, is wrong. There's not much point in being able to record caves, if there aren't any to record. By this I don't just mean Tasmania. Reports I hear consistently tell of threats to scarce karst areas from a variety of reasons. 'Forecasting the future of Australian Speleology' is placed last with little mention of the loss of caves for the future.

The magnitude of the disaster looming in Tasmania seems not to be taken seriously on the mainland. There appears to be a media silence on the issue at the moment. ASF affiliated clubs and societies, and especially individual members of these should not let the Gordon-Franklin issue lapse. Surely there are enough numbers throughout the ASF to make some impression on the powers that be? Don't just write one missel and then glide along conscience free, having 'done one's duty'. Keep writing regularly to politicians and the media at an individual and club level. It might even work!

**** - * - * - ****

Editor *ASF Newsletter*: Rosie Shannon, 44 McCaul St., Taringa, Q., 4068. (07) 3708959
Distribution: Tony Culberg, P.O. Box 36, Lindisfarne, Tas., 7015. (002) 438546
Back Issues: Brian McQuillan, 27 Liggins St., Hazelbrook, N.S.W., 2779. (047) 586868
Subscriptions to: John Taylor, P.O. Box 52, Glen Innis, N.S.W., 2370.

**** - * - * - ****

Deadlines for copy for Issues 94 and 95 are 1 November, 1981 and 1 March, 1982 respectively.

Here follow two letters to the editor. They are printed in the order in which they were received.

**** - * - * - ****

LETTERS TO THE EDITOR

In his review of Greg Middleton's compilation on the caves along Tasmania's wild western rivers, (*ASF Newsletter 92*) John Dunkley laments the application of politician's names to caves. His objection is that, when the campaign is over, one remains 'saddled' with the names. John also questions 'whether any public sympathy or longstanding publicity results from this' and comments that it does one's image little good with the Geographical Nomenclature Boards.

To the first complaint, i.e. one is saddled with the name afterwards, I would only comment that I would rather have and be left with a cave bearing an unfortunate name than no cave at all. The real question ought to be, does it help the cave survive? 'Longstanding' publicity is seldom necessary in the sort of conservation skirmish becoming typical in Tasmania, while the naming of a cave after any politician is likely to gain a little public sympathy from at least one side of the fence But is that the point? The application of politician's names to the Gordon-Franklin situation was not so aimed. (Incidentally, let me note at this juncture, that contrary to the comments in the Tasmanian *Hansard* extract in the *ASF Newsletter 92*, the name Fraser Cave was a joint rather than a personal decision.)

In 1977, the Gordon-Franklin caves were perceived as threatened:

> That it might perhaps be otherwise, it has been resolved to name caves to be flooded after the Premier, the Prime Minister and the leaders of the State and Federal Oppositions to focus the attention of those who must decide the region's fate upon its enormous value as a wild and natural place
>
> *Tasmanian Wilderness Society Journal 4* :17.

Since I wrote those words four years ago, the growth of the campaign has meant the need for such a tactic is now hard to perceive, but remember that cavers largely kicked off the western rivers fight one way or another, and that at the time, no one had heard of the Franklin River, almost. The correspondence of that time leaves no doubt that the tactic worked admirably.

On John's final point i.e. we should be wary of offending Geographical Nomenclature Boards, I would only suggest that cavers have no need to grovel before bureaucrats. The Tasmanian Nomenclature Board has a hideous record of nomenclature designed to further the public relations efforts of despoilers - witness the political chicanery involved in the application of the name 'Lake Pedder' to the artificial impoundment which destroyed the original lake. It is a name designed to help the HEC promote its claim that it was merely "enlarging" the Lake.

The Board has also shown a complete lack of any sense of responsibility in the names it has applied to caves and in its publication of exact locational information despite the absence of protective management.

The confusion in *Hansard* as to which minister was responsible for the Board, says more than I ever could.

In declining to enter into debate with the Board, I was recently forced to conclude in a letter to the Minister that it seemed to me to be ' bureaucratic irrelevance....(which)....does not have anything better to do.'

In Tasmania at least, there is no real need for cavers to submit names to the Board anyway, other than the overwhelming desire of some to be 'official' and which too often translates as 'unnecessarily bureaucratic'.

Kevin Kiernan.

It is time to reply to some of the scathing remarks made about the Tasmanian Nomenclature Board both in the *ASF Newsletter* (No. 92, page 3) and in some caving club publications. As I have been a member of the Board for about ten years and represent geological and caving interests, I feel reasonably well qualified to speak in its defence.

The matter concerns the naming of caves along the Gordon and Franklin Rivers. In recent years, some eight caves have been named after state and federal politicians by certain cavers in order to attract attention to the danger of hydro-electric development in the area. It is a sad reflection on the kind of society we live in that this is seen as the best way to attract the attention of the media. The practice of naming caves after politicians was imported to Tasmania from New South Wales, where it was used as part of the 'Save Colong' campaign.

State nomenclature boards in Australia and similar bodies in most western countries have guidelines for naming, which include rules which prevent the naming of features after living people, with rare exceptions for those who have made a major contribution to exploration and discovery and may be so honoured while in the declining years of their life. The ASF accepted a similar set of rules at the Perth Conference in January 1979. This, however, does not seem to have made much difference to the actions of some of its members and member societies.

The rules have been introduced for a very good reason: to remove the business of naming from political influence and interference. In past centuries, the giving of names by explorers was often used to curry favour with their superiors and in manipulations involved in political decision making. There seem a few determined people in the caving fraternity who feel that the end justifies the means and that if the naming of caves after political figures gets you the attention of the media for a good cause, then that justifies everything. They do not seem to realize that conservationists are not the only people who can exert political pressure, even on such humble activities as geographical naming. Once the door is open to one source of pressure, it will be very difficult to resist it from other quarters.

Contrary to the popular image created by some cavers that the Tasmanian Nomenclature Board consists of a bunch of aged bureaucrats who have nothing better to do than to frustrate the ambition of conservationists, nothing is further from the truth. Two thirds of the Board consists of representatives of various government departments, the other third (four members) are appointed by the Minister for Lands on the recommendation of the Chairman of the Board. They are appointed because they have particular interests or skills that are useful to the Board. I am one of the four outside members.

Despite the dominance of government departmental representatives, Board members are there almost without exception because they are interested in nomenclature. Ever since I joined the Board, the Chairman has been Chris Butler, the Surveyor-General, who, through his humour, good sense and fairness has done much to keep the decisions of the Board out of the political arena. In fact, I do not even know the political persuasion of most of my colleagues on the Board. We are not interested in playing politics. The cave naming along the Gordon and Franklin Rivers has threatened all that.

The Board first considered cave names in these areas several years ago and decided to ignore the names since no alternatives had been suggested and all the caves were small and apparently of little significance in the Tasmanian context.

The situation changed dramatically early this year with the discovery by Kevin Kiernan that "Fraser Cave" on the Franklin River is an important archaeological site. You will have read about this in *ASF Newsletter* No. 92, and the site is every bit as important as he says. This made the official naming of the cave a matter of urgency. To accept the name "Fraser Cave" would not only mean breaking our own guidelines but <u>far more importantly</u> would open the door to political pressures from other directions. Since no alternative names were available for consideration, the Board invited both Kevin Kiernan and the National Parks and Wildlife Service to come up with suggestions for alternative names. Both declined. The only suggestion the Board received was from Roy Skinner who proposed the name "Archaio Cave". As no other suggestions were received, the Board accepted this name. The National Parks and Wildlife Service has appealed to the Minister for Lands (who is also their minister) to reconsider the decision of the Board and approve the name "Fraser Cave".

The Minister has the power to override the decisions of the Board but has not done so in the past. There is a real danger he will do so this time. If he does, it will be the end of a Nomenclature Board free of political interference. The outside members of the Board would probably resign to be replaced by political nominees. Geographical naming would be at the mercy of political pressures instead of decisions being made in an impartial sense by interested people.

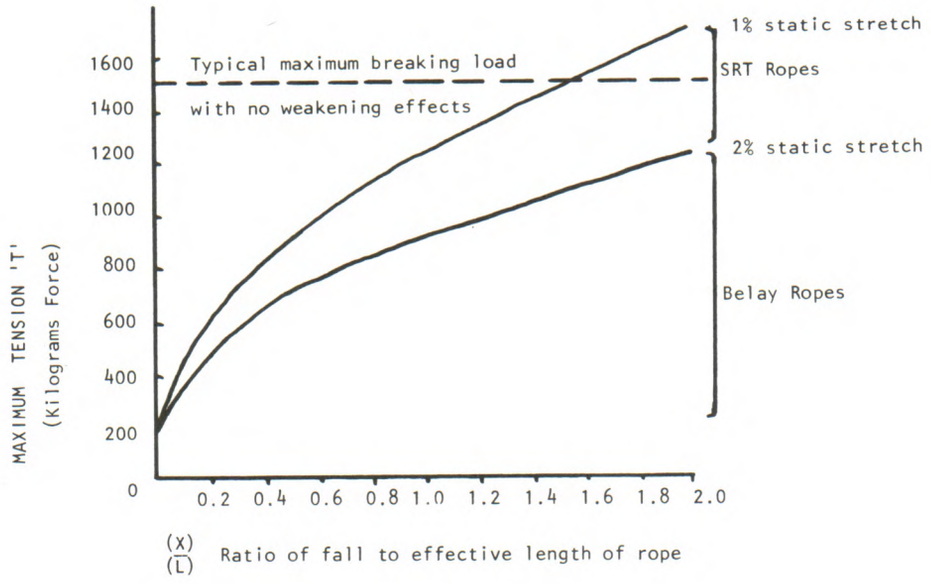
Albert Goede.

Further contributions are invited on the above topic - Editor.

**** - * - * - ****

ERRATA, ASF NEWSLETTER No. 92

In the article 'The Tension Developed During a Fall Onto a Rope', there are some typographical errors and the graph presented is the wrong one. My apologies to Brian Carter. Please amend your article in *ASF Newsletter* 92. Corrections are as follows:



Graph to show the maximum tension developed in a rope during the arrest of a falling 80kg caver.

TYPOGRAPHICAL ERRORS

$$\text{MAXIMUM STRAIN ENERGY} = \frac{K\Delta^2}{2} \quad \text{Joules}$$

Equation (1) $Mg\,(X+\Delta) - 0 = \frac{K\Delta^2}{2}$

Equation (3) $T = Mg + \sqrt{(Mg)^2 + 2KMgX}$

Rope stiffness $K = \frac{8000g}{YL}$ Newtons/metre

Tension $T = M + M\sqrt{1 + \frac{16000X}{MYL}}$ Kgf

**** - * - * - ****

CAULDRON POT

S. Eberhard

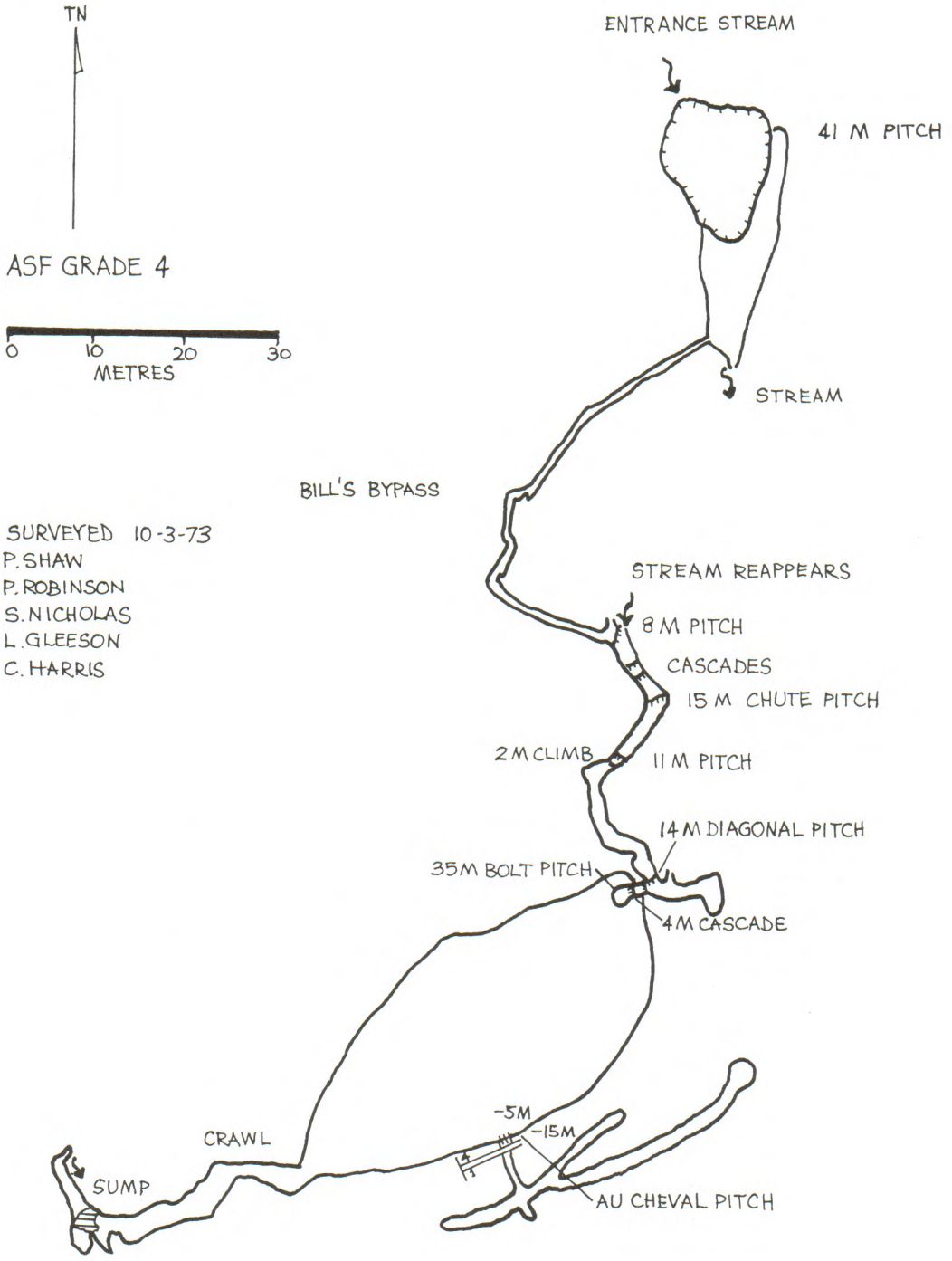
Cauldron Pot is an impressive pothole in the Junee-Florentine limestone area, some 90 km from Hobart. The cave is deep, wet and physically demanding and along with Khazad-Dum it must rank as one of Australia's top sporting 'classics'.

The entrance to Cauldron Pot was located on the 22 November, 1969 by a Tasmanian Caverneering Club party led by Bria Brian and Jeanette Collin.

The first exploration attempt was made during the 8th Biennial ASF Conference (December, 1970) when John Taylor (VSA) found the 100 feet of ladder carried was insufficient to reach the bottom of the large entrance pit. A second attempt, soon after, saw Kevin Kiernan make a very watery descent into a large chamber with at least two possible leads

CAULDRON POT JF2
JUNEE

PLAN



SURVEYED 10-3-73
P. SHAW
P. ROBINSON
S. NICHOLAS
L. GLEESON
C. HARRIS

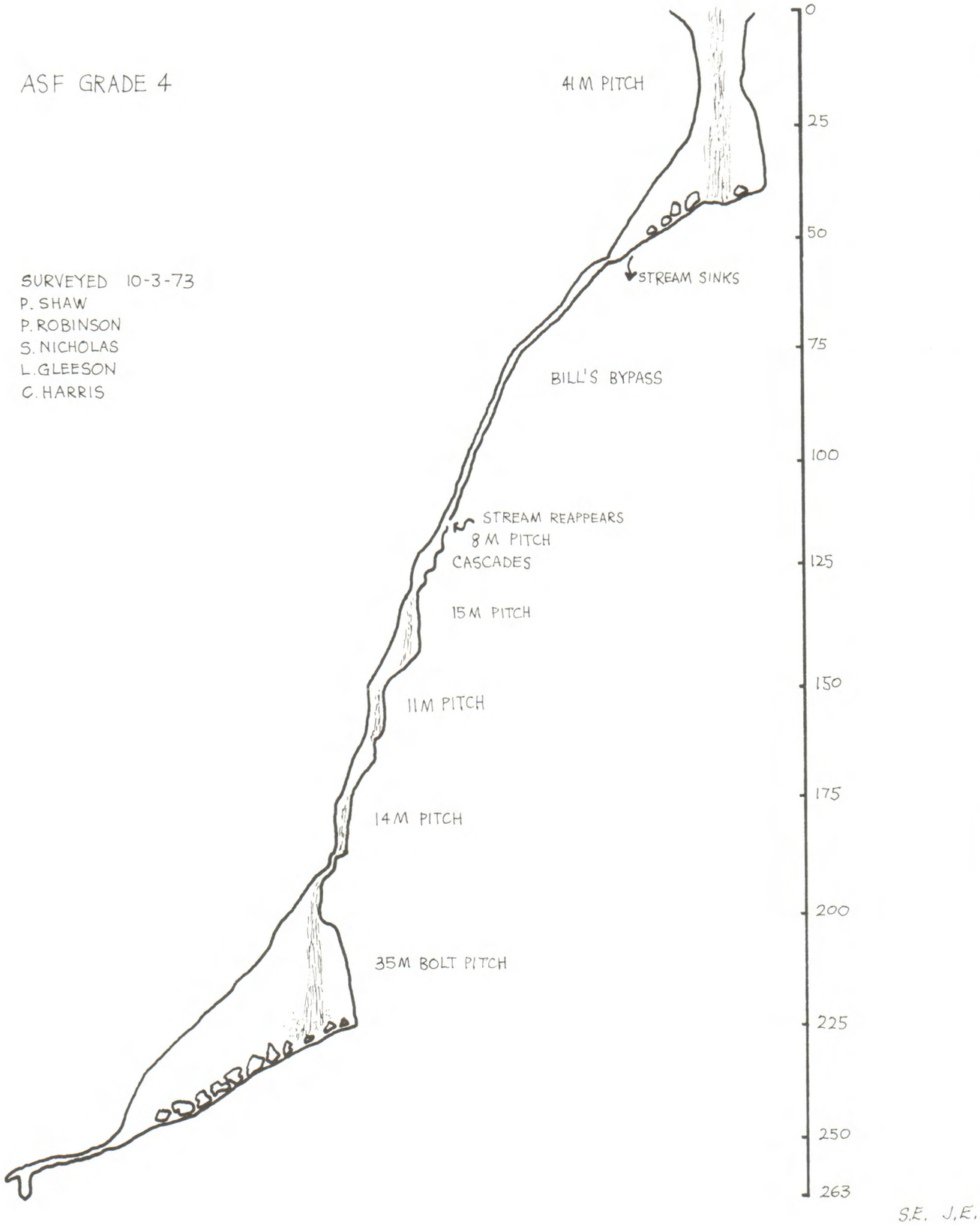
S.E. J.E.

CAULDRON POT JF2
JUNEE

SECTION

ASF GRADE 4

SURVEYED 10-3-73
P. SHAW
P. ROBINSON
S. NICHOLAS
L. GLEESON
C. HARRIS



S.E. J.E.

CAULDRON POT (Cont.)

The following week, John Taylor, Phil Robinson and Laimonis Kavalieris (NUSS) managed to get one man to the bottom of the 140 foot pitch, but no route on was seen.

In February 1972, Robinson, Pete Shaw and Laurel Norbury returned to the pothole only to verify that the talus through which the stream sinks was too dangerous to warrant further investigation.

Cauldron Pot was always considered to have good potential; the stream entering the hole is presumed to be one of the many tributaries which resurge from the Junee Cave nearly 400 metres lower. It was on this basis that Shaw and Lehmann returned in December of the same year to find a way down a jagged bedding-plane squeeze 80metres deep and 100 metres long, to finally re-emerge in the main stream passage. The following weekend, the same party returned with Brian Collin and with the assistance of SRT and bolting equipment, descended the steep streamway down a series of five pitches before being stopped by a thundering waterfall which disappeared into the unknown gloom.

On 20 January 1973, Shaw, Kavalieris and Stuart Nicholas surpassed the viscious final 35 metre waterfall with the aid of a bolt traverse. The cave was bottomed in a 12½ hour trip.

On 27 January, Shaw,Lehmann, Kavalieris and Julia James further investigated the large terminal chamber, discovering both the sumps. The Au Cheval pitch was also discovered and several hundred metres of new passage was explored.

On 10 March, 1973, Phil Robinson led a party consisting of Pete Shaw, Stuart Nicholas, Leigh Gleeson and Chris Harris to the cave. This trip saw the completion of the survey, thus establishing Cauldron Pot as the second deepest in Australia at -263 metres.

TACKLE DESCRIPTION

Like the majority of deep caves in this region, explorers need to be cautioned about the risk of exhaustion/exposure This is due mainly to the strenuous nature of the cave and the cold wet pitches.

Entrance Pitch (41 metres)

The early ladder descents were rigged in the southern side of the hole, directly opposite the waterfall. More recent trips have belayed to the log on the eastern face near the number tag (JF 2). Fifty metres of rope is adequate; one protector is required on the initial edge and a further three metres of rope protection on the sharp overhang 10 metres down. A technically easier, although possibly wetter, descent may be made by belaying to a tree on the northern edge.

A narrow slot in the western wall, at the lower end of the entrance chamber, forms the beginning of Bills Bypass. It is a steeply descending "sadistic" squeeze 100 metres long and 80 metres deep; the less said about it the better.

Second Pitch (14 metres)

This pitch drops 8 metres from Bills Bypass into the stream, followed by two short cascades of two metres and along this wall and tie off to the second bolt. (Hangers were placed by a party under the leadership of Dave Barlow (SSS) in December 1980). It is very important that the rope is well-protected on the sharp overhang; the remaining 30 metres is free-hanging and provides an exhilarating abseil beside the crashing waterfall.

Au Cheval Pitch

This is described by Shaw (*Speleo Spiel* #78:5) as follows;

> Locating the passage is difficult, if you don't know where it is; about halfway down the chamber in the left hand wall. The passage is a narrow slit five metres up from the floor. Coil half of a 20 metre rope and toss the coils into the passage to jam it in the side of the passage. Prussik up carefully!! Belay a 30 metre rope to a block of talus in the main chamber and pass it over the lip and down the other side. A tackle bag is necessary on the lip. The lip of the passage is a knife edge with the five metre drop into the main chamber on one side and the 15 metre drop on the other. All rock in the vicinity is very friable, no bolts or pegs could be placed.

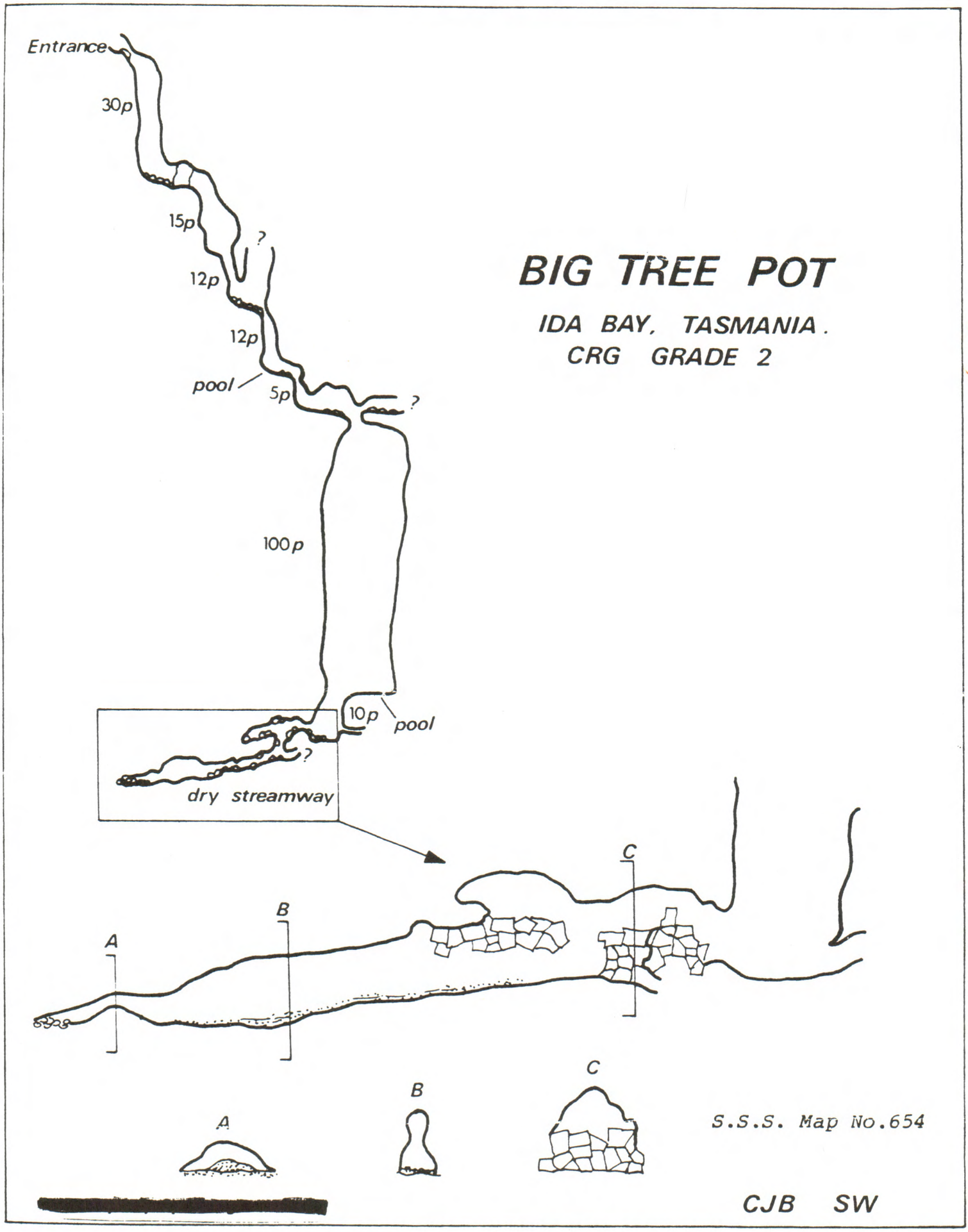
**** - * - * - ****

BIG TREE POT, IDA BAY, TASMANIA — AN INTRODUCTION

C. Barlow

This is a record of a trip to Big Tree Pot, near Mini Martin. A trip report was published in the SSS *Journal* , but were not fully aware of the role of the ASF or of the *ASF Newsletter* and therefore the ASF did not officially hear of it. Consequently, there have even been rumours from Tasmania that the cave had not yet been bottomed. Please note that it was not entirely an SSS trip, as there were members from CTCG and SCS in the party who were fully involved in the planning and exploration.

Also, you will observe from the Grade 2 map that the pitch is 100 metres to a fairly wide ledge, then there is a further drop of no more than 10 metres, making a total of no more than 110 metres. I am not sure if this makes it the


Entrance
30p
15p
?
12p
12p
pool
5p
?
100p
10p
pool
?
dry streamway
A
B
C
A
B
C
BIG TREE POT
IDA BAY, TASMANIA.
CRG GRADE 2
S.S.S. Map No.654
CJB SW

BIG TREE POT, IDA BAY, AN INTRODUCTION (Cont.)

longest underground pitch, but certainly a more accurate survey will have to be done before this can be determined.

A DESCENT OF BIG TREE POT, IDA BAY, TASMANIA

D. Barlow

Big Tree Pot is located approximately 100 metres from Mini Martin, and anyone who has had the misfortune of trogging in that area will realize that these caves are situated on Marble Hill, directly above the Exit System.

Finding one's way on Exit Hill is very difficult indeed. The blue tape-marked track is easy enough to follow but the horizontal scrub is more than enough to reckon with! An hour's walk from the road will bring you to Exit Cave, but it is another hour's walking to Mini Martin, which links to Exit Cave via a series of pitches. In winter Mini Martin acts as a 'breather' for the huge Exit system below - it is not uncommon to see great jets of water vapour shooting from the entrance shaft. A relatively easy 'scrub-bash' from here will bring you to an insignificant little hole - its only claim to fame being a very large tree approximately three metres in diameter.

As far as we know, Big Tree Pot has been entered only once before by a group from the Australian National University. They descended the following pitches - 30m, 15m, 12m and 12m. Here they were stopped at the top of a rift, by a pitch they estimated at 60metres. Lacking this amount of rope, they retreated, but were convinced that, like Mini Martin, Big Tree Pot joined Exit Cave.

CAVE DESCRIPTION AND TACKLE REQUIREMENTS

The whole cave being very unstable, with the pitches vertically above one another, extreme care must be taken throughout.

Entrance Pitch (30m): The rope will hang almost free if belayed from the chokstone on the surface. The cave is entered down a rocky slope on the left. The slot at the beginning of the abseil is fairly tight but opens out to a two metre rift. One protector is needed for the slot. The pitch ends on a loose, rocky slope.

Second Pitch (15m): An extra five or six metres of rope or tape is needed here to belay from the pillar to the right. Very loose at the top. A 1.5 metre ledge halfway down needs protection on the edge. This pitch ends in a two metre diameter chamber and a pile of large, loose rocks.

Third Pitch (12m) : There are two possible belay points for this pitch. The first one, a small flake two metres up on the right, needs a trace. The other is a doubtful looking chock about two metres above the flake in a slot. This would need six metres of five centimetre tape. We used the first belay point and tied back onto the previous pitch rope. One protector was used on the lip and another two to three metres down. Descending this pitch, one can see a very spectacular aven on the left.

Fourth Pitch (12m) : Belay a trace around the large projection at ground level on the right. This is the only belay point; the pitch has a difficult start. This may be overcome by starting on the other side of the projection. One protector was needed at the top. The pool at the bottom (1.5 metre diameter) is only ankle deep and can be avoided easily.

The cave continues through a narrow slot and opens into a very small chamber. The four metre drop requires a rope to abseil or aid in climbing down. The passage opens up slightly into a 2.5 metre chamber covered in white mud formations. Keeping to the right, a narrow passage and a one metre drop lead into a 4x8 metre chamber with two large columns in the centre. There are pools of water fed by constant drops from the roof. The next pitch is around to the left.

On our arrival at the so-called 60 metre rift pitch, a stone was found and a stopwatch organised. The rock fell free to the floor, the resounding 'boom' indicating an enormous shaft or chamber. The time being an impressive 4.5 seconds, the shaft was estimated at between 100 and 120 metres (using Montgomery's formula $5t^2$ where t=time in seconds). Because it was such a long free drop, we were wary of the accuracy and decided to tie a 50 metre and a 20 metre rope together. We belayed around a large stalagmite projecting at the lip, and I lowered myself into the tight rift.

Three metres down , the rift opened out into a chamber of massive proportions. The walls were fluted, the light from my carbide disappearing into the gloom as spray filled the shaft.

As I descended, I protected a bad 'rub-point' about six metres down in case I had to retreat before another person descended. The enormity of the shaft created superb acoustics, with echoes continuing for several seconds.

The knot appeared slowly out of the darkness and I realised how hopelessly inadequate the 20 metre was - I could just see the other end of it dangling, a long way from the bottom. I had another 50 metre of rope, with which I replaced the 20 metre lemgth. Anxious to see just how far the pitch went, I passed the knot and abseiled more quickly. The rope was a metre short, but the stretch got me there. I was standing on a large ledge with another ten metre drop immediately below me. The entire pitch length was 110 metres and virtually free-hanging!

Shane soon appeared and went through to the lead, both of us hoping to find a connection as we were now 200 metres underground and near Exit Cave level. We pushed all the obvious leads including a narrow unstable stream passage which

(Continued on page 11)

BIG TREE POT, IDA BAY, TASMANIA (Cont.)

unfortunately ended in a gravel choke. Judging by the silt marks high up in the rift, it was obvious that water had banked up considerably. We feel that any connection with Exit would probably be by a high-level bypass. Owing to the amount of mud, a breakthrough might be made by digging.

ACKNOWLEDGEMENTS

Thanks to S. Wilcox and C. Mylan for the map and helpful comments and to C. Mylan for the cave description.

The party was made up of : C. Mylan, S. Wilcox, M. Wilson, D. Barlow (SSS), E. Garnett (CTCG) and S. Eberhard (SCS).

Reprinted from *Journal of the Sydney Speleological Society*, 1981, *25* (2):23-25.

**** - * - * - ****

NOTICES & NEWS

WACCON PROCEEDINGS

WACCON Proceedings are available from Rauleigh Webb at 60 Cobden St., Bayswater, W.A., 6053. The cost of the Proceedings is $10 (including postage). Please make cheques payable to WACCON.

NIBICON PROCEEDINGS

Those participants at NIBICON should send their current address to Andrew Pavey, 45 Arcadia St., Glebe, N.S.W.,2037. Andrew needs an up to date address list. Andrew is trying to organize the NIBICON Proceedings. Sounds promising.

PRINTING OF THE *ASF NEWSLETTER*

Are there any takers to take over the organization of the printing of the *ASF Newsletter* in Tasmania for 1982? Contact Tony Culberg.

FOURTEENTH BIENNIAL CONFERENCE

The Fourteenth Biennial Conference of the Australian Speleological Federation will be held on the 3-7 January, 1983 at Flinders University, Adelaide. The Conference will have two topics as basis of discussion. These will be

1. Visual aspects of cave recording
   - (i) This theme will cover all aspects of cave recording. Topics will be inclusive of photography, both in two and three dimensional, and their application in mapping, scientific and navigational activities in caves.
   - (ii) Trends in cave mapping and the advent of computer plotting, alternative methods of depicting caves and holograms.
   - (iii) Use of information retrieval systems.

2. Forecasting the future of Australian Speleology
   - (i) How advances in technology affect speleology.
   - (ii) Cave access and management in the coming decade. How past trends may affect the future.
   - (iii) Population pressures on our natural cave resource.

**** - * - * - ****

Mary held her candle low. At the bottom of the wall she saw the beginning of a band of clay, the Tough Tom red marl that never let the water through. She went forward slowly into the wet. The floor was stiff and tacky under her boots.

Alan Garner, *The Stone Book*.

THE LEGACY OF GLACIER KARST

Kevin Kiernan

Although in comparison to carbonate rock, glacial ice is a more unstable medium for karst development owing to its mobility and susceptibility to rapid reduction by melting processes, and the karst features produced more temporary, in the longer term glacial karst may still have a significant and lasting impact upon an evolving landscape. This in itself is a compelling reason for its investigation. The purpose of the present article is to mention some of the ways in which transient glacier-karst ice forms may leave a legacy in the landscape after the ice has retreated. That legacy may perhaps serve as a solace to the glacier-speleologist with dreams of what might have been had one not been so tardy as to arrive a few millenia too late!

Glacier ice may be regarded as a metamorphic rock following recrystallisation from the original snowflake form by refreezing and deformation. Its movement is obviously responsible for substantial landscape modification through erosion and deposition, but glacier karst may also leave its own characteristic imprint after the ice has receded.

The contribution which the study of glacier karst might make to glacial geomorphology was recognised in the 1940s and 1950s by Dr. Hans Carol, who undertook some glacier cave exploration. An initial attempt to reach the bed of the Lower Grindelwald Glacier was thwarted at a depth of 72 metres or roughly one third of the total estimated glacier depth by a narrow constriction and water-filled basin ("GS" 1947). Subsequently, he penetrated marginal crevasses, and his observations shed new light on the formation of roches moutonees (Carol, 1947).

Flow of the host material (ice), flow of meltwater, air movements and to a lesser extent, biogenic agencies, may all develop caves in snow and ice. The mechanisms involved have been reviewed elsewhere (McKenzie, 1972; Kiernan, 1978). A wide range of karst-like ice forms may result (Clayton, 1964; Kiernan, 1980a).

Glacier karst and deposition by ice

Various mechanisms of glacial deposition involve cavities developed within the ice mass. Gravenor (1955) and Gravenor & Kupsch (1959) have attributed the "prarie mounds" and "circular disintegration ridges" of the North American Great Plains to glacier karst. Such mounds of debris reach 70 metres in height and date from the Late Last Glacial Stage. They are suggested to have resulted from silt and clay-rich fill having flowed into sinkholes on the glacier surface, the mounds being left in the landscape after the ice recedes and representing inversions of these fills.

Parallels may exist in the limestone area at Mole Creek, Tasmania, where Burns (1957) has suggested some talus masses at the foot of the Western Tiers to be the former fill of dolines left behind after the surrounding limestone was removed, although Jennings (1967) raises the alternative possibility of slumping of overlying formations following solutional removal of the limestone as described by Thomas (1963) from Britian.

In his discussion of glacier karst, Clayton (1964) drew attention to the hum-like form of isolated blocks of fill-covered ice beyond the end of some glaciers. When the ice core melts, the hillock may be replaced by a depressed kettle hole, giving rise to a sort of hummocky landscape as may be seen on a small scale near Waldheim in Tasmania's Cradle Mountain area.

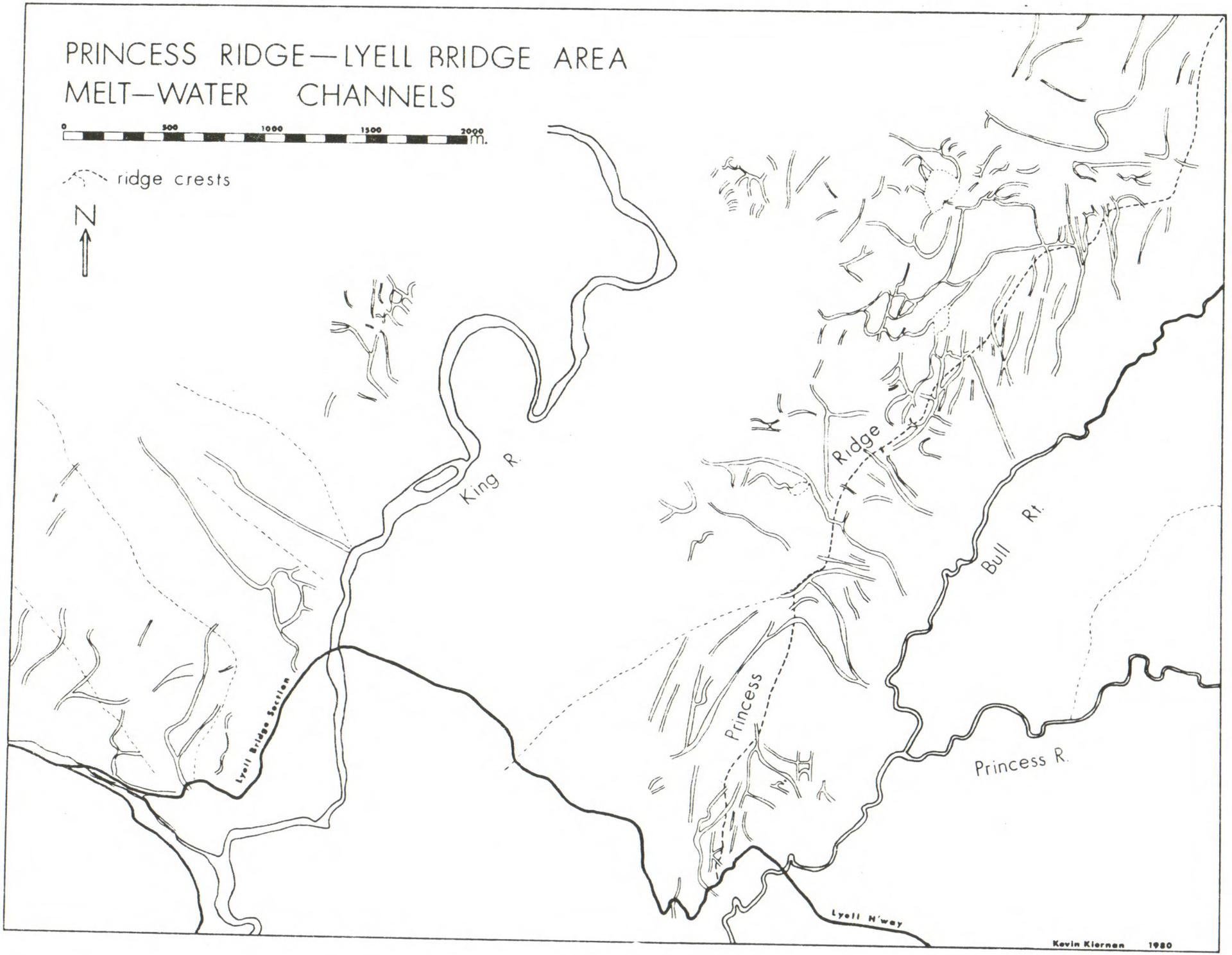
Other depositional landforms may also rely on karst-like features in glacier ice. Crag and tail features may be due to the deposition of rock debris in cavities formed downstream of protruberances in the glacier bed. Some theories of drumlin formation envisage subglacial cavities, and very large areas of landscape may be affected. Saturated material may be squeezed by the pressure of the overlying ice into bed cavities in the ice. Some mechanisms proposed for the production of fluted moraine demand basal cavities. Fluted moraine occurs in Tasmania in the West Coast Range (Bowden, 1974 Kiernan, 1980b).

Glacier karst and meltwater features

As a glacier flows from its source area to its terminus, an increasing proportion of the flow is in the form of liquid rather than solid water, hence caves and tunnels in the ice are more prominent lower in the glacier's course. This meltwater leaves both a depositional and an erosional legacy. The sources of liquid water have been reviewed elsewhere, and will not be repeated here (Sugen & John, 1976; Kiernan, 1978).

The hydraulic gradient is more a function of the slope of the glacier surface than the topography of its bed, and hence surface drainage divides may be breached by glacier karst meltwater conduits developed within or upon an ice surface Where surface ice channels are lowered onto the landscape, or basal streams are forced to rise over convexities in the glacier bed by hydrostatic pressure, linear rock cut channels may result, which for part of their course inpmly streams flowing uphill. Other channels indicate gravity powered flow.

Temperate glacial ice represents a more readily erodible material than the more resistent bedrock which frequently underlies it. Davies (1961) found basal channels formed in ice were more abundant than those cut into bedrock beneath Svartisen in Norway. However, englacial conduit systems move downstream with the ice, whereas enclosing topography, equilibrium lines and other factors may be more fixed, demanding a more permanent channel. Shreve (1972) suggests it is a quest for permanence that some meltwater channels are eroded in bedrock rather than the ice.


PRINCESS RIDGE—LYELL BRIDGE AREA
MELT—WATER CHANNELS
0 500 1000 1500 2000 m.
ridge crests
N
King R.
Ridge
Bull Rt.
Princess
Princess R.
Lyell Bridge Section
Lyell H'way
Kevin Kiernan 1980

THE LEGACY OF GLACIER KARST (Cont.)

Where meltwater channels occur in the landscape, they indicate the former presence of glacier karst drainage. The similsrity of the rock incised meltwater channel pattern in figure 1 to a cave map is striking. These channels were mapped by the writer during 1980, and occur on Princess Ridge and the eastern end of Mt. Lyell in western Tasmania. They probably represent the meltwater drainage during two late phases of the Comstock Galciation (penultimate) at the maximum of which a glacier extended for 30 kilometres down the King River Valley, prior to 130,000 years ago (Kiernan, 1980b).

During the earlier of the phasa represented, ice, moving broadly southwards, overtopped Princess Ridge and an ice surface gradient declining to the south-east provided hydrostatic head to drive meltwater in waterfilled caves up and over the crest of the ridge. Steep chutes plunge downslope on the lee side. Enhanced meltwater erosion in this situation is related to equipotentials and other factors outlined by Shreve (1972). The situation bears some similarities to epiphreatic speleogenetic conditions in limestone karst.

During a later phase, the ice surface declined and the glacier was confined between Princess Ridge and Mt. Lyell. To the meltwater already generated in the declining glacier was added ronoff from Princess Ridge. The darker bedrock was also preferentially heated by the afternoon sun owing to the aspect of the ridge and this accentuated melting of the adjacent ice.

Evidence of meltwater drainage in the Princess Ridge area is well preserved because of the strike of the rock underlying the galcier partly paralled the hydraulic gradients, hence comparatively small flows were able to cut channels in the rock along joints. However, meltwater channels may be kilometres long and hundreds of metres deep. In Tasmania, many major rivers rose from glacier caves during the Pleistocene glaciations, and many present courses represent inheritance of these previous channels. The King River is one such stream. In the West Coast Range, the upper reaches of the East Queen River occupy a deep channel which may have been iniated by meltwater flowing in a basal meltwater cave under the Queen River Glacier during the Linda Glaciation, with subsequent inheritance and deepening (Kiernan, 1980b).

The nearby caves on the Dante Rivulet may represent a special type of meltwater channel, whereby the glacier karst drainage of the Dante Glacier of 18,000 years ago was superimposed onto limestone bedrock to initiate limestone karst features contemporaneously (Kiernan, 1980a, 1980c). Similar situations on a more dramatic and emphatic scale have been recognised in Canada (Ford, 1979). It is tempting to speculate upon the possible implications of such a perspective for other Tasmanian limestone areas, for example the Mole Creek system. Jennings and Sweeting (1959) considered the breach of the divide at Mole Creek to be due to the decanting of proglacial meltwater from glacifluvial fans against limestone. However, an earlier glaciation has since been recognised during which ice extended much further than previously envisaged, pouring straight off the Western Tiers and well down the Mersey Valley (E. A. Colhoun, pers. comm.). Moreover, Jennings (1967) noted apparently contradictory cold climate effects at Mole Creek, with some caves being infilled rather than elaborated, and there is evidence of infilling also from Junee (Goede, 1973) and Cooleman Plain (Jennings, 1976). Both infilling and elaboration may have occurred simultaneously in different parts of a proglacial Mole Creek karst, but it is also possible that submarginal glacial meltwater became preferentially entrenched in the limestone rather than the ice during the earlier glaciation, with infilling and glacifluvial deposition in the caves occuring proglacially during more restricted ice conditions of the Last Glacial Stage.

Various depositional landforms also result from meltwater circulation in glacier karst. The most obvious are eskers which classically are sinuous ridges of waterlain materials deposited in subglacial meltwater caves. In the absence of lateral migration in water-filled tunnels, deposition may be confined to one vertical plane, with the cave roof raised by melting as deposition continues. Eskers may disregard bedrock topography where they are deposited by meltwater under hydrostatic pressure. In Sweden, some eskers are hundreds of kilometres long (Embleton & King, 1975) and others in Maine (USA) reach 160 kilometres in length (Thornbury, 1957).

An interesting form of deposit in glacier karst cavities is described by Fairbridge (1979). Conical hills of kame in Yellowstone National Park comprise sand and gravels deposited in a cavity in the ice formed by geothermal melting.

In summary, glacier karst may be responsible for erosional and depositional features which are long-lived in the landscape to a degree which belies the impression which might be given by the comparatively short-lived karst morphology itself. Appreciation of this karst perspective may aid the interpretation of glacial landforms, and where glaciers and limestone coincide, there may be much to be gained by bearing in mind the possible implications of former glacier karst. Despite the absence of glaciers from Tasmania today, their past presence has left a legacy of landforms indicating that well developed glacier karst has previously existed on the island. Glacial ice has, in the past occupied a far greater proportion of Tasmania than limestone does today. Eat your heart out , you latter day Casteret!

REFERENCES

THE LEGACY OF GLACIER KARST (Cont.)

REFERENCES

Bowden, A. (1974) The Glacial Geomorphology of the Tyndall Mountains, unpublished thesis, University of Tasmania.

Burns, K. (1957) The Geology of the Dairy Plains district- Dept. Mines. Unpublished Interim Rep. Tasm., Hobart.

Carol, H. (1947) Glacier exploration. *J. Glac. 3.*

Clayton, L. (1964) Karst topography on stagnant glaciers. *J. Glaciol. 5* (37): 107-112.

Davies, W.E. (1961) Glacier caves in Svartisen, Norway. *NSS Bul.23:*75.

Embleton, C. & King, C.A.M. (1975) *Glacial Geomorphology*. Edward Arnold, London, 583pp.

Fairbridge, R.W. (1979) Ice-cored wasteland that became American.

Ford, D. C. (1979) A review of alpine karst in the southern Rocky Mountains of Canada. *NSS Bul.41*: 53-65.

Goede, A. (1973) Hydrological observations at the Junee Resurgence and a brief regional description of the Junee area, Tasmania. *Helictite, 11* (1).

Gravenor, C. P. (1955) The origin and significance of prairie mounds. *Am.J.Sci.* 253(8):475-481.

"GS" (1947) A New Method of Glacier Exploration. *J.Glac.2*:78.

Gravenor, C. P. & Kupsch, W. O. (1959) Ice disintegration features in western Canada. *J.Geol.67*:48-64.

Jennings, J.N. (1967) Some karst areas of Australia *in* J.N.Jennings & J.A. Mabbut (eds.), *Landform Studies from Australia and New Guinea*, pp. 256-292. ANU Press, Canberra.

Jennings, J.N. (1976) Caves around Canberra. *Australian Spel.Fed.Guidebook 1* - prepared for Cavconact 1976, 23pp. (reprinted in *Proceedings*).

Jennings, J.N. & Sweeting, M.M. (1959) Underground breach of a divide at Mole Creek, Tasmania. *Aust.J.Sci. 21*(8):261-262.

Kiernan, K. (1978) Glaciospeleology 1: An introduction to caves and karst in snow and ice. *Southern Caver 10*(2):3-12.

Kiernan, K. (1980a) Morphological karst on some New Zealand Glaciers. *J.Syd. Spel.Soc. 24*(12):257-273.

Kiernan, K. (1980b) Pleistocene Glaciation of the Central West Coast Range, Tasmania - unpublished thesis, University of Tasmania.

Kiernan, K. (1980c) The Dante River karst area, central West Coast Range. *Southern Caver 12(3):50-59.*

McKenzie, G.D. (1972) Glacier Caves. *Ann.Bul.Int.Glaciospeleo.Surv.1.*

Shreve, R.L. (1972) Movement of water in glaciers. *J.Glaciol.11*(62):205-214.

Sugden, D.E. & John, B.S. (1976) *Glaciers and Landscape*. Edward Arnold, London, 376pp.

Thomas, T.M. (1963) Solution subsidence in south-east Carmarthenshire and south-west Breconshire. *Trans.Inst.Bnt. Geogr. 33:*45-60.

Thornbury, W.D. (1957) *Principles of Geomorphology*. Wiley, New York.

**** - * - * - ****

THE WILD RIVERS CAMPAIGN — An update

Kevin Kiernan

In the last issue, I outlined recent developments in the exploration of the caves and karst along Tasmania's wild western river valleys. This new note outlines the dramatic events which have since occurred, and which threaten the future of one of Tasmania's largest limestone area and numerous smaller, little explored karsts.

Since gazettal of the Wild Rivers National Park, pressure from the pro-hydro lobby has increased substantially. Proposals advanced to resolve the conflict between the government and Upper House have included a referendum (now proposed, but without a 'no dams' option-Ed.) a joint sitting or a state election. All of these have been resisted by the state government. Tasmania's Upper House, the most powerful in Australia by virtue of its ability to depose a state government by refusing supply without itself having to face an election, has steadfastly refused to change its stance despite several public opinion polls which have all shown a majority of Tasmanians in favour of saving the Franklin. The growing success of the "no more dams in the south-west" movement has promoted a vociferous response from the most powerful interests in Tasmania. Industry and big business, the state Liberal Party, trade unionists and the Upper House have savagely attacked the government and the conservation movement.

The conservationists campaign has been marked by a peaceful protest, including a street demonstration in Hobart involving 10,000 marchers- an enormous number given the population of the city. By contrast, HEC unionists demonstrations involving at most a couple of hundred individuals received greater media publicity, partly by virtue of their aggressive behaviour, intimidatory tactics and abuse. One unionist demonstration in Hobart saw police protection necessary for

THE WILD RIVERS CAMPAIGN - AN UPDATE (Cont.)

Democrat parliamentarian Dr. Saunders when HEC supporters rallied outside Parliament House.

Then, there is the side supressed by the media. Windows of cars bearing proconservation stickers are being smashed in the streets of Hobart. One conservationist managed to extinguish a fire set in his car, another found a fire lit against the rear wall of his house at night. On a recent visit to a karst area in western Tasmania by the writer and his party, an unattended car left by the roadside overnight and bearing a pro-conservation sticker lost two windows to a guidepost which was thrust through them. The car was not unlocked by the attackers, and money was left undisturbed. Access to the bonnet catch was all that apparently desired, for it transpired that the brakes had been sabotaged with the fluid having been removed, and other fluids drained from the under the bonnet. The police treated it as simple vandalism and would only record the breaking of the windows. It might be that we are about to see a repetition of the events which marked the latter days of the Lake Pedder campaign in the early 1970s, when cars were vandalised at the Lake Pedder tracks bushwalkers assaulted on the roadside and two Lake Pedder protestors vanished aboard a light aircraft en route to Canberra. It was later discovered that the hangar housing the aircraft had been broken into the night previously and the 'black box' flight recorder removed and hidden. No trace of the aircraft or its occupants has been seen since.

In June 1981, the state ALP conference instructed the government to call a referendum to decide the issue, but in a move which would effectively disenfranchise those opposing all dams in the South-West. The conference indicated the question should merely be between the HEC favoured Gordon-below-Franklin option and the government favoured Gordon-above-Olga project, which would still flood the Gordon Splits, Nicholls Range karst, Denison archaeological site and other features. State Premier Doug Lowe's formerly firm stand is under immense pressure and a referendum now seems likely - with the massive publicity resources of big business, multi-nationals and the pro-hydro lobby generally ranged against the limited financial capacities of an ultimately uneasy alliance between the impoverished conservation movement and a battered state government whose own intentions fall far short of those of conservation.

In early July, ambitious education minister, Harry Holgate, sought to take advantage of the situation and unseat the beleagured Doug Lowe as parliamentary leader of the party. It was unsuccessful, but in a subsequent spill, Lowe jettisonned his energy portfolio to enable him to spend more time promoting policy. Within a few days the new energy minister Julian Amos, who earlier in his career had aligned himself with the conservation lobby, moved in caucus to reverse the policy and flood the lot. His motion was strongly rejected-this time- but his opportunist stance threatens to precipitate a split which would be the final nail in the coffin of the state government and perhaps the death knell for that which remains wild and beautiful in south-west Tasmania. And the resignation of the demoralised Lowe as premier has become a real possibility.

A glimmer of hope in the gathering clouds lies in the Federal Senate, where the ALP and Australian Democrats are committed to an enquiry into Tasmania's energy needs. Sadly, the Liberal Party seems to have silently renounced its earlier undertaking to protect the entirity of south-west Tasmania through nominating the area under the World Heritage convention. There are, of course, some elements of the Liberal Party which suggest it to be out of touch with public opinion. But we may well see in the coming months just how vulnerable that public opinion is to the power and money of big business faced with the realisation that Tasmania truly stands on a momentous threshold with ramifications far deeper than the burgundy waters of the Franklin River or the precipitous chasms of the Gordon Splits . . .

For it is no exaggeration to say that Tasmania stands with its whole history poised on a brink which may turn that history. From that there flows real joy and hope. For it is a time when Tasmania may yet renounce the avarice, greed, myopia and cowardliness which has marked so much of the passage of human development In a place as small and as isolated as Tasmania, humanity, integrity, beauty, life, dignity and hope may yet have a place.

What can you do?

(1) Remember the situation involves individuals with needs and emotions - encourage the flagging Tasmanian premier and government to resist the Franklin flooding.

(2) Tell them any referendum should be really into the powers of the undemocratic state upper House, and that any energy referendum should include a 'no dams' option.

(3) Lobby senators to ensure their proposed enquiry goes ahead.

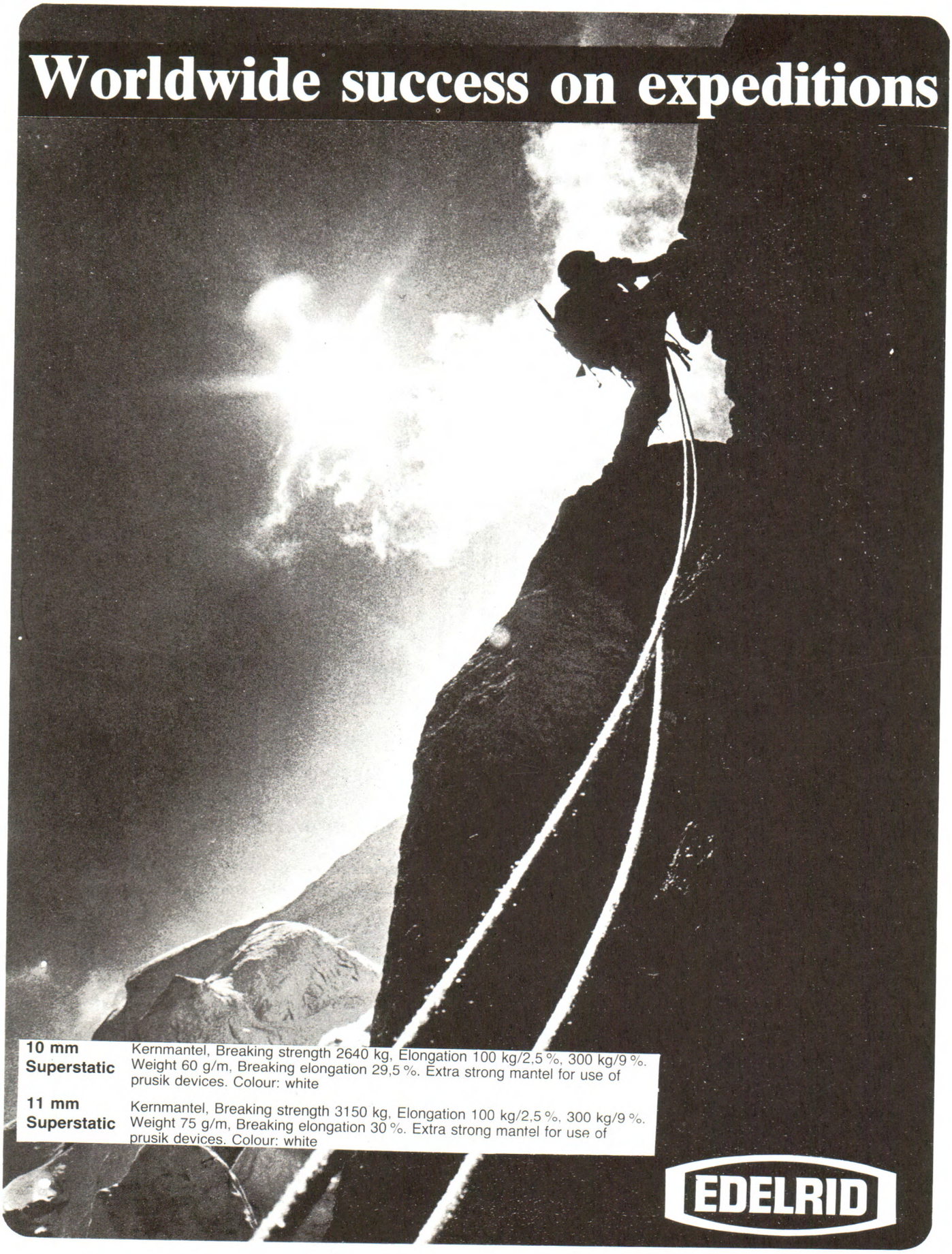
(4) Ensure Tasmanian conservationists have the funds to fight the publicity moguls and promote their alternative proposals for cogeneration and energy conservation.

(5) Don't be intimidated into hiding your beliefs when in Tasmania.

(6) Write to TWS, 129 Bathurst Street, Hobart and ask how you can help. Stay aware!

**** - * - * - ****

Worldwide success on expeditions



10 mm Superstatic	Kernmantel, Breaking strength 2640 kg, Elongation 100 kg/2,5 %, 300 kg/9 %. Weight 60 g/m, Breaking elongation 29,5 %. Extra strong mantel for use of prusik devices. Colour: white
11 mm Superstatic	Kernmantel, Breaking strength 3150 kg, Elongation 100 kg/2,5 %, 300 kg/9 %. Weight 75 g/m, Breaking elongation 30 %. Extra strong mantel for use of prusik devices. Colour: white

EDELRID

AVAILABLE FROM

MOUNTAIN EQUIPMENT PTY. LTD.

17 FALCON ST., CROWS NEST.
62 CLARENCE ST., SYDNEY

(02) 439 2454
(02) 29 4840

Send for a free pricelist.

BUSHGEAR Pty. Ltd.

sell practical high quality clothing, boots, gear, books and maps for all Outdoor People.

Sleeping bags for all occasions

Down or Synthetic fillings

Sigg Aluminium bottles watertight and fuel-tight.

Ski Touring is going places and Bushgear can help you get there and back with a full range of Touring skis, boots, bindings and waxes.

Wool Clothing–best for Australian wet-cold conditions–shirts, breeches, pullovers, socks, balaclavas, mittens, underwear.

Down Clothing–lightest insulation for dry cold such as Himalayas–duvets, trousers, boots, mittens, waistcoats.

Synthetic filled–good designs can offer a reasonable compromise.

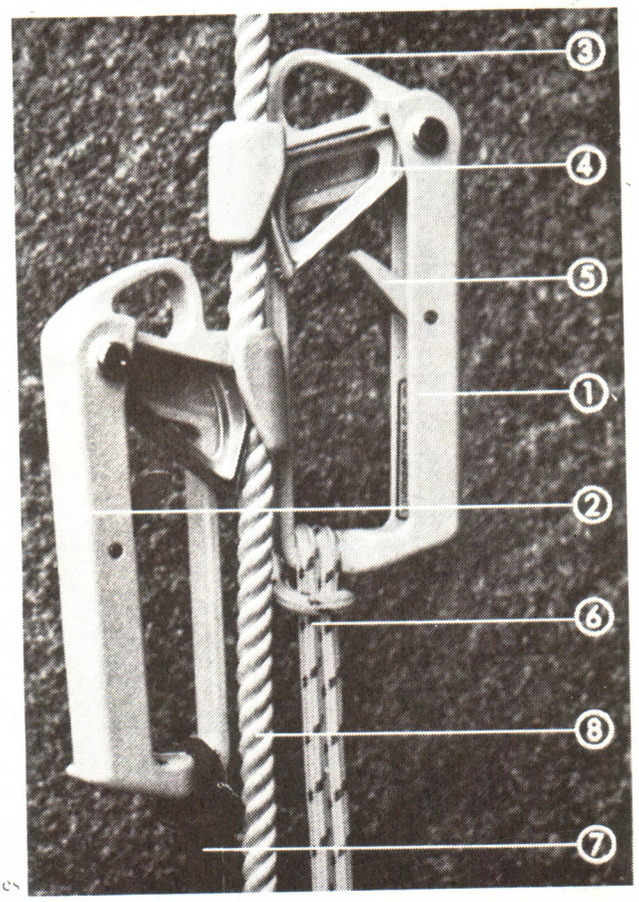
Wind and Waterproof outer clothing of oiled cotton japara or good coated nylon–parkas, overtrousers, gaiters, mittens, overboots.

plus packs, tents, stoves, compasses, whistles, survival bags and blankets, sleeping mats, cooking gear, ropes, chocks, tapes, karabiners, iceaxes, crampons, icescrews, mountain skis, caving ladders and lamps, prussikers.

Write for our catalogue *(please enclose 80c, refundable on purchases)* **or call upstairs at**

46 Hardware Street, Melbourne 3000

Phone 67 3354 or 67 7966



JUMAR

Made in Switzerland
Patent applied for

For ascent and descent operations on ropes. The universal and compact rescue device in pocket-size

Ideal for

mountaineers — expeditions — cave explorers — rescue work-inspection and renovation work on high buildings