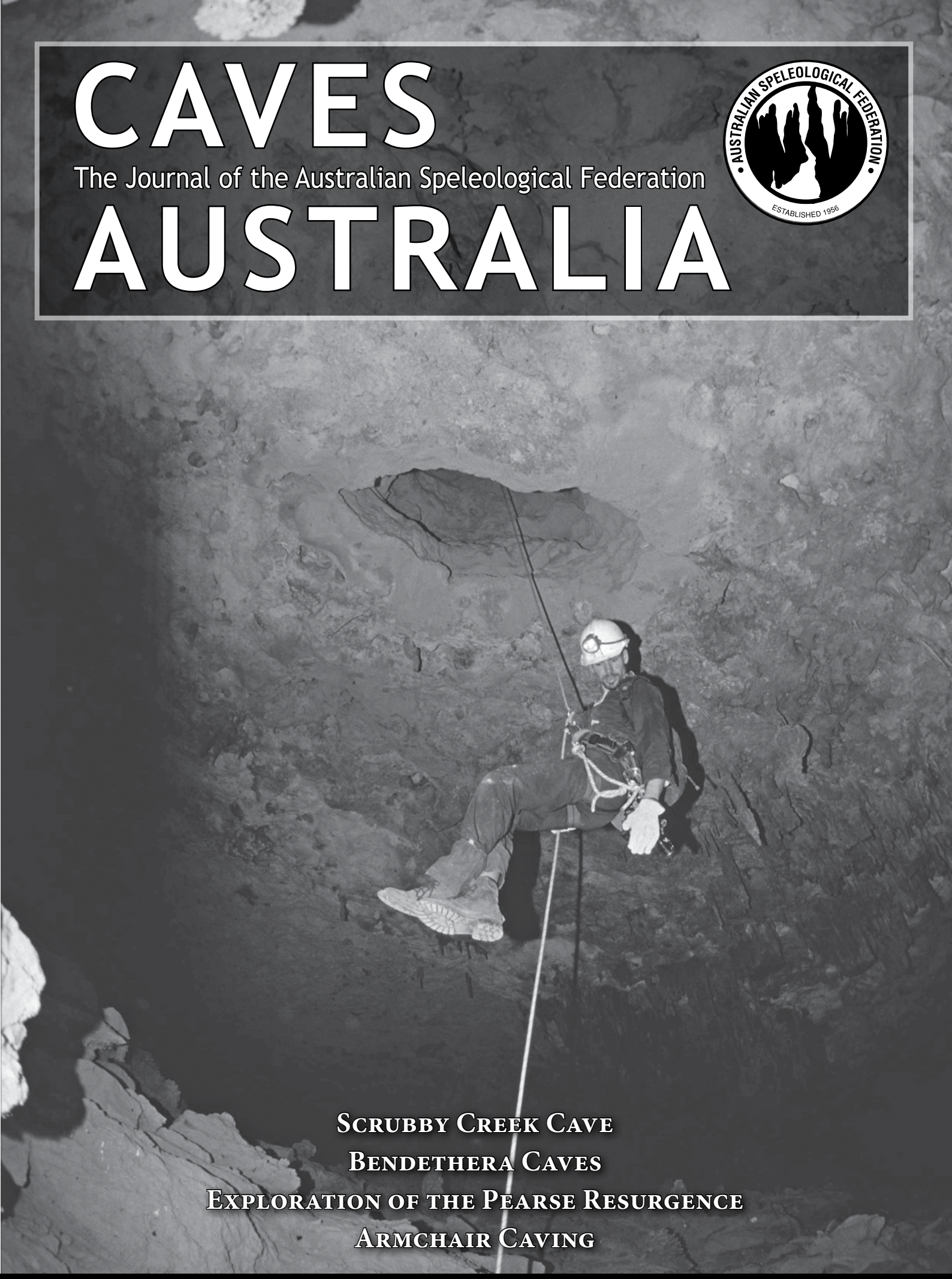
CAVES AUSTRALIA

The Journal of the Australian Speleological Federation



Scrubby Creek Cave

Bendethera Caves

Exploration of the Pearse Resurgence

Armchair Caving

No. 188 • MARCH 2012

COMING EVENTS

This list covers events of interest to anyone seriously interested in caves and karst. The list is just that: if you want further information the contact details for each event are included in the list for you to contact directly. A more extensive list was published in ESpeleo *earlier this year. The relevant websites and details of other international and regional events may be listed on the IUS website http:///www.uis-speleo.org/ or on the ASF website http://www.caves.org.au. For international events, the Chair of International Commission (Nicholas White, nicholaswhite@netspace.net.au) may have extra information. This list only covers events in 2011 and the first half of 2012.*

However, 2013 looks very busy with the next ASF Conference, TAGalong, in January at Galong NSW, the ACKMA Conference in May at Waitomo Caves, New Zealand and the international IUS congress in July at Brno, Czech Republic.

We'll keep you posted on these events in future Caves Australia *issues*

2012

June 25-29

NSS Convention in Greenbrier Valley, WV. For details see the MAYACON 2012 website (http://www.nss2012.com/)

August 5-10

International Geological Congress, Brisbane. This is a large and general conference but does have a karst section. For details see http://www.34igc.org/

September 13-15

International Congress on Scientific Research in Show Caves, Skocjan Caves Park, Slovenia. The Congress will focus on scientific research in show caves. For details of the venue, program and costs check the Park Škocjanske jame website http://www.park-skocjanske-jame.si or e-mail: psj@psj.gov.si for details.

September 16 -21

39th International Hydrogeology (IAH) Congress, Niagara Falls, Canada. The 2012 Congress will allow the presentation of a wide variety of new and evolving hydrogeological issues and opportunities that includes a major session on Karst Hydrogeology. For details see: http://www.iah2012.org/index.php

2013

January 6-11

Trogalong: 29th Biennial ASF Conference, Galong. NSW. Australia. Hosted by the New South Wales Speleological Council. Further details in this *Caves Australia* with the first circular.

May

ACKMA Conference, Waitomo Caves NZ. 20th Cave Management conference Dates to be confirmed. For details contact the conference convener, Libby Chandler: conference.convenor@ackma.org

July 21-28

16th International Congress of Speleology, Brno, Czech Republic. For details see the website http://www.speleo2013.com/bi=ut Start planning now!

Peter Berrill

PETER BERRILL died on his 59th birthday on 27th February 2012 after several years battling cancer.

Peter had been President of Central Queensland Speleological Society as well as ASF for a period.

He fought for the cessation of mining at Mt Etna with a protracted campaign which eventually saw mining finished and rehabilitation started.

The continued survival of the ghost bat, a central issue of the campaign, is still in question.

His time as ASF President was one of change and re-invigoration, culminating in the ASF being classified as an Environmental Organisation by Canberra.

This enabled ASF to establish a tax deductible gift fund now known as the Karst Conservation Fund which is his lasting legacy and of which he was very proud.

Peter is survived by his wife Diana, their sons Luke and Nathan and their families and a large extended family.

A full obituary of Peter and an account of the Mt Etna campaign will appear in the next issue of *Caves Australia.*

— Nicholas White

Helictite Volume 41

THIS ISSUE is in its last stages of production and we hope to print it in late May or early June.

It is a special issue on the Judbarra/Gregory Karst including Bullita Cave. It will have 96 pages of papers and colour photos and extra copies will be printed. Detailed information available soon.

The contents list is:

- Introduction: The Judbarra/Gregory Karst. *(Ken Grimes)*
- A History of Cave Exploration. *(Bob Kershaw)*
- Surface karst features. *(Ken Grimes)*
- Epikarstic maze cave development: Bullita Cave System *(Jacques Martini & Ken Grimes)*
- Karst and paleokarst features involving sandstones. *(Ken Grimes)*
- Preliminary notes on the cavernicolous arthropod fauna *(Timothy Moulds and Peter Bannink)*
- Managing the survey information of the caves. *(Bob Kershaw)*

This will be a definitive publication on the exploration and science of Australia's longest cave and its surrounding area.

CAVES AUSTRALIA

Caves Australia is the Journal of the Australian Speleological Federation and is published quarterly.

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Editorial contributions are welcome!
For contributor guidelines, contact the Production Manager.

Advertising
Contact the Production Manager for commercial, caving community and classified rates. Rates range from $5 to $400 for full page mono back cover. Discounts apply for placements of 4 adverts and an up-front payment.

Issue Dates
March, June, September and December

Magazine Subscription
Journals are included within ASF membership fees. Subscription to the magazine is also available to non-ASF members at $40.00 including postage within Australia for one year (four quarterly issues).

Change of address
Notify us immediately of any address changes to ensure delivery of your *Caves Australia.*

Layout and Production by Summerleas Print, Kingston, Tasmania

Caves Australia

No.188 March 2012
Australian Speleological Federation
PO Box 388 • Broadway • NSW 2007 • www.caves.org.au
ABN 15 169 919 964
ISSN 1449-2601 • Registered Publication NBQ0005116

ASF

Contents

Cover: Paul Devine descends into Leaenas Breath cave. Photo by Clay Bryce

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EDITORIAL

WELCOME back after the summer (if you were lucky) break. At least cooler weather encourages longer hikes into caving areas made difficult by the heat.

Our main cave at Cliefden (Cl 1) is a fairly constant 17 degrees. In summer it is usually sought out for coolness; this year it has been sought out for its comforting warmth.

❖

Information has just come to hand on the passing of three highly respected and influential cavers: Peter Berrill (former President of ASF), Jak Kelly, Foundation President of SUSS, and Paul Devine (SRGWA). Short synopses of Peter and Paul's caving careers are in this issue.

Valedictions are not to hand as this issue goes to print and there will be more on these cavers in our following issue.

❖

Our series on caving areas in NSW which might be of interest to those coming to Trogalong next January is continued.

This issue introduces Bendethera, and an article on Bungonia is being prepared for *CA* #189.

❖

Stephen Bunton's article in *CA* #185 (Whatever Happened to Mole Creek?) has elicited several responses.

His article summarised the history of Mole Creek caving, the problems of divided land management/ownership and his concern for the future.

The responses do not contradict Stephen's analysis, nor his concern for 'systematic documentation'.

Writers felt that individual work carried out by a local caver has been undervalued and misrepresented.

After discussion with the publishing team I have decided to publish all letters.

It is not *Caves Australia* policy to restrict discussion of ideas, though the letters, to a great extent, only quarrel with the perceived representation of one caver.

President's Report

THIS SPOT consists of multiple spots of different hues.

When we first took up the challenge of venturing into the dark unknown we mostly were unaware of the impact and changes that would take place in us from then on. We changed, our perspective of the world would continue to change and we invariably changed other people by making them aware.

Some of my caving associates who continue to inspire and direct me have died this year:

Andrew Wight, a past SUSS cave diver with a long track record of discovery, exploration and documentation of both the wet and dry parts of caves. He was a dedicated storyteller.

Peter Berrill, a CQSS cave warrior, fighting for cave conservation and preservation, particularly around Mt Etna.

Paul Devine, a SRGWA caver who found new and re-found old caves, documented them and shared his vast knowledge of caves particular on the Nullarbor and adjacent plains

Jak Kelly, founding president of SUSS, keen caver, bushwalker and orienteer who made a lasting impression in the early years of Australian caving.

Long will they be remembered for their individual contributions to cave exploration and educating people about the unfamiliar places below the surface of our planet.

I managed another caving trip, in my seemingly endless business, to one of my favourite areas in the Flinders Ranges. Looking for a new cave recently reported by VSA cavers, it didn't quite surprise me that their accurate GPS reading divulged nothing.

Unperturbed, because that is often what happens in caving, I continued looking over the ranges verdantly draped as the result of extra seasonal and transforming rains. I took a fall and drew blood, requiring a bandage over a deep gash. This was an official club trip and the incident should be reported and documented appropriately. Trivial, you say? No. We must report and gather statistics to show us better ways of caving, including getting to and from caves.

Please continue to send your accident forms to SLARM who compile and analyse

cave accident data to help us identify ways to improve our caving safety.

Other coloured spots reflect more of what ASF is currently doing and continues to do better:

- Make time and space in your diaries for the next ASF Conference; Trogalong 2013.
- Understand what it means to Australian speleology if we successfully bid for the IUS congress in Australia.
- We have held a successful ACRC-organised 'vertical and self-help' CROP course in Tasmania.
- We have recently held a multi-organisation Australian cave dive rescue/recovery workshop in SA which was attended by ASF/ACRC.
- Expeditions to the north and the west are being conducted by several clubs over the next months.
- We have a number of publications at the printers.
- Business discussed at recent executive meeting included committing time, effort and money to the professional and business interface that ASF has as a not for profit organisation committed to Australian Speleology. We must continue to be forthright in the world with an improved website and a more public image.

Looking forward to meeting and hearing about your activities at Trogalong and through *Caves Australia* articles in the meantime.

In Caving
Stan Flavel

Letters to the Editor

I AM WRITING to you in reference to 'Whatever Happened to Mole Creek?', an article in *Caves Australia* 185 on the history of Mole Creek documentation presented by Stephen Bunton.

There are a few comments made by Stephen that he may not be aware of regarding the efforts of recent years to document the Mole Creek karst.

The Mole Creek (MC) area documentation is not up to date is for a number of reasons.

The main reasons are not having a permanent coordinator (a massive role considering the diversity of ownership) for cave entrance numbering and recording them in the state database as they have been discovered and the poor relationships that eventuated from certain user groups not doing the right thing with property owners and the various authorities in the past.

Speleos and others have been coming to this premier caving area for over 60 years and have written reports in various journals and newsletters, but no one has ever been able to fully maintain and collect all of this literature and work towards maintaining a data base.

This can only be achieved if all user groups provide/pass the information to the coordinator, permitting the person(s) to keep accurate records.

There have been a number of attempts made to update the database on Mole Creek, the most recent being published by Arthur Clarke in 2000, which on all accounts was a bloody good effort.

This is not a criticism of past or present speleo groups or individuals, but what was thought to be a way to document the Mole Creek karst at the time, which has clearly not worked as well as was hoped.

The list by Arthur has been of great value to Stephen Blanden when he made the decision to bring the Mole Creek documentation totally up to date, whatever effort or time might be required.

He has clearly done so in the past, as is shown by his publications on Gunns Plains and Moina. For his efforts he was awarded the ASF Certificate of Merit in 2005.

Stephen has certainly not taken an amateur approach to this enormous task.

His professional and respected agricultural knowledge and pleasing manner have permitted him to document public and private karst areas that have not been accessible for some time.

Stephen has undertaken to talk to anyone who has any knowledge on the caves and karst and to read any literature on the Mole Creek area that would assist him in eventually bringing the state data base up to date on any caves that have been documented, tagged or surveyed.

Finally, after ten plus years of selfless dedication walking and searching the Mole Creek karst, (along with many other areas) he is reaching the point where nearly all the caves found in the past have been located.

Stephen, through Northern Caverneers, has welcomed all assistance, with Savage River Caving Club, Newcastle and Hunter Valley Speleological Society and Sydney Speleological Society, just to mention a few groups that I am aware of, having helped Stephen document the karst, along with relocating lost caves, (and finding a few new ones) and bringing, whenever possible, the documentation up to date with cave descriptions and surveys, later printed in the Northern Caverneers' journal, *Troglodyte*.

I have personally gone along with Stephen to ensure that there is someone caving with him, particularly when doing vertical work, or walking a new area whenever I have been in the state.

Members of Northern Caverneers and a long list of close friends have been more than happy to go with Stephen whenever requested.

Although Stephen is at present having to make some adjustments in his life, he has remained focused on documenting those areas of karst he has had a close association with over the years, and with the aid of those close to him, the knowledge that has been gained by Stephen will be published in a manner that safeguards all, morally and ethically, as required under the ASF constitution.

Northern Caverneers may be a small group of speleos, but as *Troglodyte* shows in depth, they have maintained an accurate set of records, and it's these records that have further assisted Stephen, along with members of Northern Caverneers, to rediscover so much of the past discoveries, permitting Stephen to work towards publishing more on Mole Creek karst over recent years.

Northern Caverneers have also been the driving force to getting Karstcare up and running through David Wools-Cobb.

The work carried out to date is nothing short of amazing, and can be read about in *Troglodyte*.

This work has permitted NC members, along with visitors, to visit nearly all parts of the Mole Creek karst.

As for cave access at Mole Creek, I personally have never been refused access to a single area of karst since 1968 when I started caving there, be it on park, forestry or private lands, and of recent years it has actually been easier, so I thanks those who have quietly made it possible for so many.

John Wylie

I find Stephen Bunton's article "What happened to Mole Creek?" (*Caves Australia* 185) full of discrepancies, especially in relation to the work of Stephen Blanden and I wish to further expand on Jodie Rutledge's letter in *Caves Australia* 187.

Stephen Blanden is an experienced and published cave explorer who has been responsible for finding, tagging and mapping many caves in the Gunns Plains, Miona, Loongana, Wilmot River, Vale of Belvoir and Mole Creek areas. He has published several books on his findings and has been a regular contributor to the journals of the Savage River Caving Club *(Speleopod)* and more recently Northern Caverneers *(Troglodyte)*.

Stephen Blanden's professional caving approach has resulted from long term agricultural management which has been carried through in his passion and professional approach to caving.

Karst documentation is Stephen's sole pursuit in his personal life, resulting in long term documentation of karst on public and private holdings and therefore it would be hard to consider him an amateur.

This documentation, like all other information collected by Stephen, has been published, adding to the greater knowledge of karst environments, including Mole Creek.

His long term commitment to systematically documenting caves has been with the assistance of many different cavers from Northern Caverneers, Savage River Caving Club, Sydney Speleological Society and Newcastle Hunter Valley Speleological Society, just to name a few, who hold him in high regard. Through his professional

approach to understanding karst environments, Stephen has worked with and shared information with a number of science based persons within government authorities.

He has established good relationships with Mole Creek locals, including Tasmanian Parks and Wildlife Service, Forestry Tasmania, Karstcare, Mole Creek Caving Club, the state karst coordinator (Arthur Clarke) and private landholders to consolidate and update the fragmented karst files.

This is an undertaking that no one has been able to do until the present and Stephen is still working to ensure information on the Mole Creek karst will be forthcoming in the foreseeable future.

At the end of the day we are all volunteers and there are very few who are professionally paid to document karst. Stephen Blanden's contributions, like those of other cavers, have greatly enhanced the knowledgebase of professionals.

Liaising with fellow cavers who are doing the hard yards in exploration will lead to greater knowledge for us all. Caving is not a right; it is something we are privileged to be able to partake in.

Jill Bennett
Northern Caverneers

Being Safe

Chalky Thomas
VSA

ANYONE who has caved with me knows that I'm a stickler for safety checks whilst abseiling and climbing in caves or on open cliff faces.

I've been doing outdoor recreational activities involving roping for 30 years and during that time have used a variety of safety checking procedures.

The procedure I now use is 15 years old and very easy to remember. It is simply called your ABCDE personal safety check.

Before I detail the safety check I'll raise another concern regarding when the safety check is performed.

During my lifetime of roping activities, I've witnessed hundreds of people on the cliff edge performing their first and only safety check, just prior to stepping backwards over the cliff.

This IS NOT the location to discover an equipment or procedural deficiency. Safety checks must be performed well away from the cliff edge.

If the abseiling rope anchor is located near the cliff edge then an additional safety line must be used and, on this safety line, your first safety check is performed. Now for the check:

A IS FOR ANCHOR.

If the rope or sling is not attached securely to a strong anchor point you're wasting your time conducting any further checks. Check the knots and karabiners are secure and orientated correctly.

B IS FOR BUCKLES.

Check all the harness buckles are done up and back threaded. Also, check that the harness fits the body firmly and cannot slide off in the event of an invert. Now check the helmet buckle is secure and the helmet fitted securely.

C IS FOR CARABINER OR KARABINER.

This is the karabiner linking the harness to your device. The karabiner must be connected to the correct points on your harness and the device, secured and orientated correctly.

D IS FOR DEVICE.

Your device is the component that connects you to the rope or safety line. It can be a descender, belay plate, mechanical ascenders, prusik knots, cow's tail or just the safety line itself.

Check that your device is threaded, secured and orientated the correct way.

E IS FOR EVERYTHING ELSE.

- Check that your clothing and hair is secured.
- Remove rings if climbing and watches and jewellery if concerned about their security.
- Check gloves.
- Check backpack, rope bags and their tethers if used.
- Secure all loose items.

An important concept of being safe is 'Overlapping Safety'.

Every time you change from one safety system to another safety system you must perform another ABCDE personal safety check.

As an example, if you're already on a safety line and are now connecting onto a rope for abseiling, you check:

- A. the new anchor system
- B. buckles, no need to re-check if performed recently
- C. the new Karabiner linking the harness to the new device
- D. the new device
- E. and everything else that has changed or is needed

Only once the new safety check is confirmed are you allowed to remove yourself from the first safety system. Finally, F is for fun, frightening, fantastic, fearful and flaming safe.

Scrubby Creek Cave, M-49

Nicholas White
VSA

FOR SEVERAL years now, I have talked up the idea that cavers acquire caves to both protect the caves and provide an educational and recreation resource as owners. Several trips to the US enabled me to examine properties of the North Eastern Cave Conservancy which are owned and operated by cavers in New England and also the Hawaiian Cave Conservancy which is acquiring lava tubes.

Little did I realise that the Scrubby Creek Property at Murrindal near Buchan in Victoria, was to come up for sale and for cavers to get the inside running on purchasing it!

Scrubby Creek Cave holds a special place for Victorian cavers. Scrubby Creek in its upper reaches for the most part is dry, its water having been captured from seepage along the contact of the volcanics and the limestone. The water emerges at the foot of a bluff depositing extensive tufa as it flows down a waterfall to rejoin Scrubby Creek on its way to the Buchan River.

This resurgence was recorded by A.E. Kitson in 1907 and Frank Moon in the 1930s tried to free dive it. However, it was not until 1960 that Sub Aqua Speleological Society (SASS) tried to dive the resurgence with little success, but then looked at a small hole slightly above the outflow at the base of the bluff.

With a bit of enthusiastic digging, progress was made and several trips later SASS managed to get back down to the water and which disappeared into a sump after several hundred metres of beautiful passage. Water levels were high and it took several trips before this sump was passed. Several more trips were needed to get as far as a muddy passage known as Trog Wallow. This led to a large rock fall that was difficult to find a way through but which opened into a large chamber, now known as Christmas Hall.

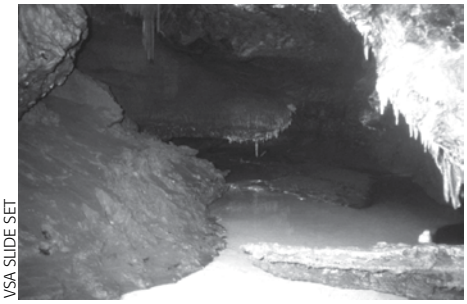
Along the floor of Christmas Hall the stream can be followed to where it emerges from rocks. The cave is now known to extend for some 1.5 km of passage, including the high level extensions. Since these first major discoveries, there have been several high level decorated galleries discovered, as well as a passage which leads to Siren Sump which is related to Storm Water Tunnel, M-43, a related cave which takes a lot of water after rain events. There was a series of unsuccessful attempts to climb to what

DARYL CARR

Neil Wilson in sump, 2011

appeared to be some high level passage in Christmas Hall and various cavers have, to no avail, poked at the rock fall at the end of Christmas Hall where the stream emerges. SASS and subsequently VSA have worked with the owners, the Woodgate family, for some 50 years to ensure that all caving was responsibly conducted. My first trip into the cave was in about 1967 and involved using woollen long-johns and a cotton boiler suit. For some reason I was made to carry the rope safety line through the sump. My first attempt had me reverse out and take my helmet off and swim with nose and one eye above water, so-called "sniffing the breezes", until after about 30 metres, headroom increases until one can stand in the shallow stream. The stream from here was flowing over freshly deposited white calcite.

The whole trip was memorable and the only thing which has changed since then



VSA SLIDE SET

M-49 Stream way and decoration

VSA SLIDE SET

Daryl Carr at the end of Trog Wallow, 1967

is that there are wetsuits and caving suits available which can make the caving more enjoyable and reduce the risk of serious exposure. Each trip I have done since still has provided the full gamut of anticipation and adrenalin rush as each new obstacle is overcome in this very exciting cave. Now that the property is for sale it was the opportunity to make words into deeds, hence the Scrubby Creek Acquisition Project. Rimstone Cooperative Ltd decided to sign a purchase contract to buy the cave. We sought and received support from the Karst Conservation Fund.

Rimstone Cooperative Ltd is a Community Advancement Society with speleological aims. It cannot distribute dividends or property to members but on winding up it has to give its assets to an organization with similar aims. Rimstone Cooperative has for 38 years owned and operated Homeleigh at Buchan for its members and the caving community. It is an ideal vehicle for establishing a caver owned and operated Karst Conservancy in Australia.

The Scrubby Creek Cave property is 105 acres and will be managed to protect the caves and karst. VSA will be asked to continue the Scrubby Creek Cave leadership scheme that it has had in place for several decades and advise on cave access. The tufa terraces will be protected from stock and blackberries and weeds removed. The property will be available for stock agistment to provide income for rates, fencing and other improvements. Rimstone will work towards a protective covenant for the property. There is an opportunity to develop an interpretive karst walk showing the tufa terraces and the remnant rain forest vegetation along Scrubby Creek.

All it needs now is further donations by cavers to support this purchase. The property will be used to protect the caves and karst. For further details contact me directly via email: nicholaswhite@netspace.net.au

Donations can be made by following the instructions on the donation form downloadable from the Karst Conservation Fund page of the ASF Website at www.caves.org.au

RELATED ARTICLE

Lloyd Mill, Scrubby Creek Cave *ASF Newsletter* 85, (1979).

Bendethera Caves

Bob Kershaw
ISS

BOB KERSHAW

The rear of the main cave and formations

BENDETHERA CAVES are found at 35º 55' S latitude and 149º 42' E longitude in the central south-western part of the Deua National Park, just below and east of the Minuma Range, approximately 250 km south of Sydney and 40 km west of Moruya.

The caves are located between Con and Little Con Creeks, in the headwaters of the Deua River, which is an upstream tributary of the Moruya River.

Bendethera is one of a related group of caving areas known collectively as the Upper Shoalhaven Karst Region.

These are, from north to south, Cleatmore, Marble Arch, Big Hole, Wyanbene and Bendethera.

The caves are accessible from the West via the Dampier Mountain Fire Trail or via the Sugarloaf and associated fire trails from Moruya (the easier access and camper trailer route).

Both of these routes require 4WD. However, if it is raining heavily do not attempt to go there as the many river crossings will stop you from arriving safely.

The topography of the caves area is rugged with steeply incised valleys. The highest areas, on the Minuma range, at 1000 m ASL provide the backdrop for summer orographic rainfalls and protection of the region from the drying westerly winds in summer and cold winds of winter.

To the west of the Minuma Range is the area known as the Krawarree region and this area is the headwaters of the Shoalhaven River, which eventually reaches the sea at Nowra.

To reach the caves the vehicles must be left at the car park and speleos and the general public have to walk for about 2 hours and approximately three and half kilometres to BD1.

The main cave is open to the public and the scenery of the region is superb. The other caves in the area require permits but it is a great place to relax and swim in the Moruya River.

An excellent location map can be found on page 42 of John and Jan Tait's *4WD Weekends* published by Gregory's in 2000 and on page 40 to 43 is an excellent description of the route taken from Moruya to travel into Bendethera.

BOB KERSHAW

The grave site and view of the Minuma Range

BOB KERSHAW

View of wattle on the karst area and surrounding area

EXPLORATION

EXPEDITION REPORT

Exploration and Biosurvey of the Pearse Resurgence, New Zealand

December 27th 2010 – January 12th 2011

NGS – Waitt Research Grant #W89-10

Dr Richard Harris
CEGSA

ABSTRACT

Six Australian cave divers travelled to the Pearse Resurgence, a vauclusian spring in New Zealand's South Island, to continue exploration of the cave and to sample the invertebrate stygofauna biodiversity of the cave.

The divers were on site for 13 days, performing a total of 74 dives in the 6.5°C water, with one diver suffering a minor episode of decompression sickness that resolved with first aid.

In collaboration with scientists from the National Institute of Water and Atmospheric Research (NIWA), 40 baited invertebrate traps were set and retrieved in the upper 115 m of the cave, and samples were preserved for subsequent analysis by NIWA.

Exploration in the deep main shaft of the cave continued from the previous point of penetration by the team in 2008, using four dry decompression habitats and other technologies to improve the safety of deep diving and prolonged decompression in the cold waters of the cave.

Results

- Analysis of the invertebrate trap fluid demonstrated a new species of amphipod, an oligochaete and a small gastropod.
- Deep exploratory dives revealed a new vertical shaft descending out of sight beyond 194 m in depth.
- Repeated dye tracing from the Ellis Basin did not reconfirm this connection.

INTRODUCTION

The Pearse Resurgence marks the origin of the Pearse Stream located on the eastern side of the Arthur Range, New Zealand. It is a vauclusian spring with an average discharge of approximately 2 m^3 per second. Dye tracing has suggested a connection as far away as the Ellis Basin; a distance of approximately 6 km.(1) The cold (6-8°C) waters of the resurgence were first dived in 1975 but the remote nature of the cave and harsh conditions have precluded extensive exploration over the years.

Several divers have played a major role in the exploration of the Pearse since the earliest dives.

Keith Dekkers from New Zealand was pivotal in the early days, visiting the cave on several occasions and pushing down the start of the main shaft. 1995 saw an ill-fated expedition led by New Zealand caver Kieran McKay during which one of the divers, Dave Weaver, perished during an attempt at a depth record whilst breathing air. From 1997, expeditions by Sydney-based diver David Apperley made the most significant advances in the cave's exploration with the first use of a decompression habitat (2000) and culminating in the exploration of the cave by Apperley and Rick Stanton (UK Cave Divers Group) to 177m in 2007.

The author first dived the cave in 2007 with Apperley and has returned on three further occasions, pushing the cave slightly further in 2008. The lower level at 182 m depth poses serious obstacles to further exploration.

Using open circuit (traditional SCUBA) technology, the amount of gas required to perform a single dive to the bottom of the cave would be prohibitive; requiring vast numbers of helium, oxygen and SCUBA cylinders to be taken into the cave. The helicopter trips required would increase exponentially as would the expense and time required for gas preparation.

The use of closed circuit rebreather technology allows the same dives to be performed with far smaller quantities of gas and also confers other benefits such as better heat retention and greater gas reserves in the event of an emergency.

However, deep cold water diving on rebreathers is not without problems. Carbon dioxide retention is a particular hazard in this setting and a very conservative approach to CO_2 scrubber management is required.

The 2010 expedition saw an increase in the complexity of the diving operations in an attempt to safely dive beyond the current 182 m limit, and then decompress for the expected 8-10 hours in the low temperature water.

A mobile decompression habitat was constructed by the author with the intention of entering the habitat at 40 m and "riding it up" to 14 m before transferring across to a second rigid habitat at 7 m depth.

Unfortunately the plan was overly complex and the mobile habitat concept failed, leaving insufficient time for ongoing exploration.

During one decompression phase, however, a small cave-adapted invertebrate was noted swimming near the wall of the main shaft at approximately 15 m depth. This and another different species (a flatworm) were captured and forwarded to Dr Graham Fenwick, a systematist at the National Institute of Water and Atmospheric Research (NIWA).

The stygofauna samples represented previously undescribed species of amphipod and flatworm.

The importance of such stygofauna is twofold — they contribute to the health of the aquifer by biofiltration and in turn they

may represent an important marker of the health of the water.

The discovery of these animals was the main impetus for a further more comprehensive biosurvey of the cave. In parallel, further exploratory dives would be performed.

THE EXPEDITION

Project Goals

- Invertebrate biosurvey of the cave.
- Continued exploration and mapping of the cave.
- Repeat dye tracing to confirm hydrological connection from Ellis Basin to Pearse Resurgence.
- High definition video of surface and diving activities.

With the assistance of a grant from the National Geographic Society-Waitt Grants Program, the author assembled a team of Australian cave divers to camp at the cave entrance in early 2011:

- Dr Richard Harris, Adelaide, South Australia
- Mr Ken Smith, Adelaide, South Australia
- Mr John Dalla-Zuanna, Melbourne, Victoria
- Ms Sandy Varin, Melbourne, Victoria
- Mr David Bardi, Melbourne, Victoria
- Dr Craig Challen, Perth, Western Australia.

In New Zealand, local cavers John Patterson and Deb Cade handled logistics. Invertebrate sampling was coordinated on site by Ken Smith under the direction of Dr Fenwick in Christchurch.

After shipping 9 m^3 of camping, diving and imaging equipment from Australia to Nelson in New Zealand, the divers departed Australia on December 27th 2010.

Access to the Pearse Resurgence is difficult as it is protected from vehicular access by approximately 5 km of temperate rainforest and a steep-sided valley.

Hence all equipment must be transported to the site from a distant logging clearing by Hughes 500C helicopter, using cargo nets with a 400-500kg capacity.

Ten loads saw all the divers and their equipment inserted into the site late on December 29th.

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The author attaches a load to the hook on the helicopter. The pilot watches through his open door.

The camp was established on the grassed area between Eyles Creek and the Pearse River, with separate areas for tents, mess tent, charging station, compressor and generator. Diving operations commenced on December 30th and were completed on January 9th. After extraction from the site, the team left New Zealand on January 12th.

DIVING OPERATIONS

Diving in the cold and deep waters of the Pearse Resurgence requires a very different approach from ocean diving.

All the divers are highly experienced cave divers, trained in Australia by the Cave Divers Association of Australia to "Full Cave" rating which is the highest qualification available. In addition, deep diving requires the use of mixed gases containing oxygen, helium and nitrogen ("trimix") and hence the team are all trained to the highest level in the use of these gases.

Five of the six divers are also using closed circuit rebreathers, which offer specific advantages for this kind of diving. Unit specific training is also required to operate these machines safely.

Recreational divers are trained to utilise air SCUBA to dive to depths of 40 m. Advanced trimix certifications recommend diving to depths of 100 m. Beyond this, technical divers are beginning to explore the limits of current technology and physiology.

Great depths have implications for issues like gas consumption, thermal protection, prolonged decompression, work of breathing due to high gas density, narcosis, oxygen toxicity and High Pressure Nervous Syndrome (HPNS).

Proven decompression algorithms are not available and the divers must to some degree construct these themselves.

Exploration in the cave reached the depth of 182 m in 2008. With the possibility that the cave would either continue at this depth or go deeper, the team needed to prepare for greatly extended decompression times in the 6.5°C water. An unclad swimmer in this water would be unlikely to survive beyond 30 minutes.

A good drysuit can extend "comfortable" dive times to over an hour. With the high quality thermal protection used by the team (compressed neoprene dry suits with built in boots, Thinsulate® undergarments, 12V heated vest, gloves and boot soles, and dry gloves), we are able to stay immersed comfortably for three hours and safely for five hours.

However, a dive to 185m for 27 minutes would require over 10 hours of decompression, well beyond the safe in-water duration.

Furthermore, a breach or leak in a drysuit early in the decompression phase would be lethal should the diver be unable to exit the water.

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Sandy Varin wearing a heavy-duty neoprene drysuit, checking her closed circuit rebreather.

Hence, a major challenge facing the team has been the implementation of dry diving "habitats" or havens within the cave, where a decompressing diver can get out of the water during the dive. The advantages of dry-decompression are many but include:

Maintaining core temperature: Heat loss in water is many times higher than that in air. Maintaining core temperature bolsters musculo-skeletal circulation and so improves the efficiency of off-gassing critical to effective decompression. Hypothermia is dangerous in and of itself, with the decreased mental acuity contributing to mistakes and accidents.

The dry environment of the habitat alters cardiorespiratory physiology in a favourable way. CNS oxygen toxicity is less likely (a major concern with the high oxygen exposures seen in these dives) and in the event a seizure does occur, drowning is less likely. Respiratory mechanics are improved and elimination of CO_2 is more efficient.

Warm food and fluids may be imbibed by the diver, which contributes to warmth, energy levels and morale.

The 7 m habitat can be used for treatment of acute decompression sickness when medical evacuation may not be feasible.

The diver is more comfortable, less bored (thanks to submersible MP3 players!) and can communicate with the surface and support divers more readily.

However, the installation of habitats is time consuming, requires practice and new skills, and carries its own risks including minor environmental impact to the cave. Each of the "IBC" containers used has a volume of 1 m^3 and hence has a lifting force of 1000kg. Unexpected movement or release of such a habitat presents great physical danger to nearby divers, especially one decompressing inside.

Entry and exit from habitats is a time of significant risk, when the diver may easily become separated from their gas supply or flood a rebreather. Finally, decompression planning is complicated by the use of pro-

longed stops at habitat depths. We would only recommend their use when possible benefits outweigh the risks and effort required.

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Diver radio based on dry caving "Michie phone" which can communicate between surface and habitats.

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The divers manoeuvre one of the bulk containers (IBC) into the cave entrance. The IBC will be inverted in the cave, secured and then filled with air to create a habitat for the divers to get out of the water for decompression.

The use of rebreathers in the cave offers considerable benefit. Closed circuit rebreathers (CCRs) use only small amounts of gas regardless of depth, compared with "open circuit" traditional SCUBA whose consumption increases dramatically with depth.

This means that less gas needs to be transported to the site by helicopter, each diver must carry less gas, dive durations can be prolonged, and more time is available to the diver to resolve problems that can develop underwater.

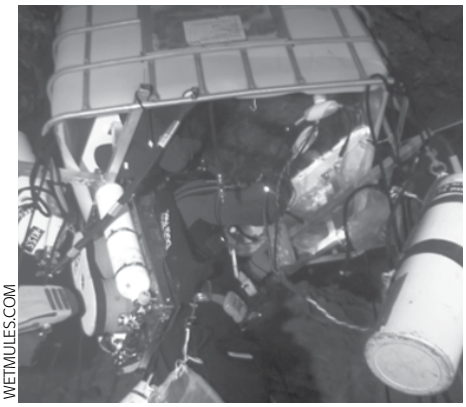
CCRs also keep the diver warmer and allow for more efficient decompression. It would be very difficult to do these exploration dives without CCRs.

Four separate habitats were installed into the cave during the first three days of diving. They resided at the following depths: 40 m, 28 m, 16 m and 7 m. Bailout (safety) gas was staged in the cave to a depth of 125 m.

Two spare small rebreathers were placed in the 40 m and 7 m habitats for use during decompression, so the diver could doff his larger main unit.

Surface supplied heating cables reached the 40m habitat so the decompressing diver could plug into the drysuit bulkhead, and activate the 12V heating undergarments.

Communications intercoms were placed in the 16 m and 7 m habitats enabling the diver to maintain contact with the surface. Support divers made regular visits to decompressing divers to check on them and give them food or drink.



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A support diver under the 28m habitat helps get the push diver settled in. Surface supplied heating cable can in seen in the right-foreground.

Once all habitats, heating cables, comms and bailout cylinders were installed in the cave, exploration dives could begin in earnest. The primary objective was to push the cave from the author's previous limit of exploration at 182 m.

Dave Bardi and Sandy Varin performed a video dive to the main deep passage, reaching a depth of 156 m. Craig Challen managed to extend the cave about 15 m horizontally and 12 m down to a new depth of 194 m.

At this point he developed some early respiratory difficulties due to the high work of breathing at depth. Rather than push on to the tempting target of 200 m, he wisely turned the dive and returned to the surface after 9½ hours of decompression. At 194 m, Craig found himself above a steeply sloping circular "well shaft" which disappeared down out of sight. Small HD cameras on his scooter and helmet recorded the record dive.

A further day of diving was required to remove the habitats and ancillary equipment from the cave, before the team was extracted by helicopter and could return to Nelson, then Australia.

DECOMPRESSION PLANNING

Diving beyond the recreational limits of 40m requires the use of decompression planning software that most would still regarded as unproven.

Dives performed beyond 100 m depths may carry a Decompression Illness (DCI) rate of over 20%[(2)], hence in a remote environment where medevac may take many hours, significant conservatism must be built into any dive planning.

A second difficulty arises when planning to prolong decompression stops in the dry habitats.

A "normal" decompression strategy would be to follow the decompression "ceiling" all the way to the surface, in other words to constantly remain at the shallowest depth allowable by the algorithm.

This maximises the gradient for off gassing and makes decompression more efficient.

Other ways to maximise the efficiency of decompression are by maximising the "oxygen window" (breathe the highest safe PO_2 possible to increase the gradient for off gassing inert gases), and to stay as warm as possible and gently exercise during decompression.

Our strategy diverges from this ideal slightly. When a diver reaches a decompression habitat they enter it and stay there for a period, despite the fact that the decompression ceiling is continuing to rise above them.

The longer they stay, the less efficient decompression may theoretically become. On the other hand, the improvement in core temperature is beneficial and so a trade-off is reached.

When the "virtual ceiling" reaches the next habitat, the diver exits and moves up to the next one at approximately 5 m/min. This continues over the four habitats staged throughout the cave until finally the diver may leave the 7 m habitat and return to the surface.

The author has coined the term "segmented staged decompression" to describe this technique.

Over the course of a 10-hour decompression, approximately one extra hour is added to the total run time due to the inefficiencies described.

However. the benefits to diver warmth, comfort, safety and morale more than justify this extra time in our opinion.

INVERTEBRATE BIOSURVEY

During the period on site, a stygofauna biosurvey was performed in the cave, with one reference sample also collected 50m downstream from the Eyles Creek junction near the southern bank.

With appropriate permission from the Department of Conservation, two techniques were utilised to sample the stygofauna.

Firstly, any invertebrates observed free swimming in the cave were captured by hand using a turkey baster (the "Stygoslurper").

This was very effective for any animals seen with the naked eye, and several specimens were captured by this technique. Macroscopically these appeared to be identical to the previously undescribed amphipod captured on the January 2010 expedition.

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Ken Smith processes and sorts samples from the baited traps.

The second technique involved the deployment of baited fauna traps in the cave at depths from 5 m-115 m below the surface. Small plastic jars baited with a small shrimp were filled with nylon gauze and secured in various places in the cave, amongst a variety of habitats and substrates.

Before deployment, the jars were filled with filtered water and the lids attached. Once deployed, the lids were removed and the trap left in situ for 2-4 days.

On retrieval, the lids were replaced and the traps brought to the surface. The water in the trap was filtered and the filtered material placed in a plastic bag with ethanol preservative. The nylon gauze was also placed in the bag with more ethanol.

The bags' contents were then sent to NIWA with data regarding trap locations, and habitat descriptions as well as substrate samples for analysis by Dr Graham Fenwick and his team.

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Ken Smith with sampling equipment. Note the housed Contour camera on the side of his helmet which successfully captured dives down to 194m depth.

ANALYSIS OF SAMPLES

(Graham Fenwick)

A total of 40 collections were made by the expedition, one from the epigean reaches of the Pearse River, the other 39 from various points within the hypogean karst system.

Of these collections, 15 contained invertebrates. Two invertebrate collections comprised solely terrestrial insects (one collembolan/spring-tail; one with beetle fragments), almost certainly inadvertent contaminants during sample processing. Another pair of samples contained only epigean stream insects (bodies pigmented and eyes well developed). Thus, 11 (28 %) of the total 40 collections contained true stygofaunal invertebrates.

One undescribed (new) species of amphipod dominated the stygofauna collected from the Pearse Resurgence. This species, completely colourless in life and with colourless eyes, belongs to the poorly known genus *Paraleptamphopidae,* one of two genera within the New Zealand endemic Family *Paraleptamphopidae.*

Originally described from Canterbury's deep alluvial aquifers, this family is represented by species (mostly new to science) inhabiting groundwater and marginally subterranean habitats throughout New Zealand.

Within the Pearse karst system, this amphipod was found most commonly within the main shaft, where the expedition's divers stalked it on rock faces or caught it in small traps baited with shrimp. It appears to live on the water-worn rock surfaces from within 2 m of the surface of the main shaft's airbell, to more than 40 m depth where they were taken amongst gravel and finer sediments.

The two other stygofaunal invertebrates discovered in the system were a minute gastropod snail (c. 1.5 mm diameter) and an oligochaete worm (c. 8 mm long). Both were taken from rare deposits of fine sandy sediments within the main shaft at depths of 15-34 m. Further identification of these await specialist study.

The apparent overall low abundance and diversity of invertebrates within the Pearse system is not unexpected.

Water entering the system appears low in both dissolved and fine particulate organic matter, so that, in the absence of light and plant or algal growth, food is scarce for invertebrates. Also, finer sediments, which often entrap fine particulate organic matter and support greater abundances and diversities of invertebrates than rock surfaces, are rare in parts of the system accessed, apparently because of low inputs of finer sediments and moderate to higher water velocities within the system at times.

Conceivably, invertebrates are more abundant and diverse in less accessible crevices closer to points of water entry and containing more sediments and organic matter. More intensive collecting, especially using airlifts or other suction devices to extract material from smaller, quieter passages and crevices seem certain to yield more abundant and richer collections of taxonomically valuable stygofauna.

DYE TRACING EXPERIMENT

The dye tracing study described by Wright[1] observed that dye placed in the small inlet known as Grange Slocker later appeared in the Pearse Resurgence.

This trip presented an opportunity to repeat this study with the assistance of dry cavers from the Nelson Speleological Group.

Two cavers flew by helicopter up to the Ellis Basin and deposited 1000 ml of Rhodamine WT ($C_{29}H_{29}N_2O_5ClNa_2$) into the water at exactly 1200hrs on December 29th, 2010.

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Oz Patterson pours rhodamine dye into Grange Slocker, several kilometres from the Pearse Resurgence

The cave divers were camped by the cave for the next 12 days and during that time, no visible colour change was observed. It is possible that the amount of dye instilled at Grange Slocker was insufficient for a visual colour change, and unfortunately sensitive fluorometry detecting hardware was not available for use. However, this negative result was somewhat puzzling.

CAVE VIDEO AND MAPPING

Most of the deep dives, and many of the shallow ones, were videoed using the small Contour® point of view HD cameras in underwater housings. These were mounted on the divers' helmets and on the front of the dive propulsion vehicles.

Review of the footage generated from these video cameras was used to aid in the construction of maps of the cave and eventually a computer generated 3D model of the cave. This was particularly useful where the depths were too great to allow traditional cave mapping techniques (such as line distance, compass bearings and tape measurements) to be used.

Together with data collected on previous expeditions by the author, a good quality map of the system is gradually being developed.

SUMMARY

- The six Australian cave divers safely achieved all the goals of the expedition to the Pearse Resurgence in New Zealand. In what appears currently to be the deepest cold–water flooded cave in the world*

seventy-five dives were performed to a maximum of 194 m with one minor case of decompression sickness being the only adverse outcome.

- The team further refined cold-water diving techniques to allow prolonged decompression in the 6.5ºC water. "Segmented staged decompression" was utilised for the first time by this team with great success.
- A repeat of the dye tracing experiment from Grange Slocker in the Ellis basin did not confirm a connection to this area.
- A stygofauna biosurvey of the cave revealed only three species of invertebrate present in low density.
- Further HD video of the cave was obtained and the map of the cave grew in detail and accuracy as a result of this and further surveying.

* There are currently 16 diveable caves in the world deeper than the Pearse Resurgence. Of these, only 10 have been dived to depths greater than the current depth (194m) in the Pearse.

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2. Doolette DJ. 'Decompression practice and health outcome during a technical diving project.' *SPUMS J.*2004; 34:189-195.

ACKNOWLEDGEMENTS

The divers would like to thank local cavers "Oz" Patterson and Deb Cade in Nelson, Dr Graham Fenwick (NIWA), BOC Nelson, Syd and Dick Deaker and Action Helicopters, Chris Holman from SCUBA Imports and Liquivision Computers, Grant Pearce and AquiferTec, GMS Concepts, Sue Crowe (Tabata Australia) and Waterproof Gloves, rEVO Rebreathers, Sea Optics Adelaide, Damien Griggs (DKG Drysuits) and Weezle Skins, and O'Three Dry Suits for their very generous support and assistance.

The team from L-R: Richard Harris, John Dalla-Zuanna, Sandy Varin, Oz Patterson, Dave Bardi, Craig Challen and Ken Smith. Absent Deb Cade.

POSTSCRIPT

The team have just completed the 2012 expedition to the Pearse River Resurgence near Mt Arthur in the South Island of New Zealand. The six Mules (David Bardi, Craig Challen, John Dalla-Zuanna, Richard "Harry" Harris, Ken Smith and Sandy Varin), were accompanied by diving physician and support Dr Karen Richardson for the 17 day trip.

Both primary objectives of the trip were accomplished. With the assistance of Nelson Speleological Group's Andrew Smith and Dawn Wood, dye tracing from the Spillway in Nettlebed Cave again confirmed the connection between the two sites. Unfortunately, the dye appeared to be coming from the main passage deeper than 120m, so any hopes of making a shallow connection were lost.

Hence attention shifted back to pushing the deep section of the cave, and once the four habitats were installed at 7 m, 16 m, 28 m and 38 m, and gas was staged in the cave, build-up dives commenced.

On Thursday 12th January Dave and Sandy dived to 180 m and completed an extraordinary seven-hour all in-water decompression.

The following day Richard Harris pushed past the end of Craig's 2011 line at 194 m, and laid 70 m of line in large passage to a maximum depth of 207 m. A total run time of 10½ hours was spent in comfort thanks to the habitats and the surface supplied suit-heating systems.

After two days of rain the resurgence flooded, delaying diving for a day. The final push dive by Craig Challen began on Sunday 15th January as the water levels subsided.

Tying off to the end of Harry's line, he scootered on a short distance only to meet another steep descent.

Craig made a final tie off at 221 m and returned to the surface after a total dive time of 17 hours. The passage continues beyond, heading deeper.

Ken, JDZ and Craig made tape measure surveys of several areas including the Nightmare Crescent and Big Room area at 120 m.

More information and images can be found at www.wetmules.com

Hungarian Caving Exam

Susan White

THE PIZOLIT Speleologist Sports Club was formed in October 1992 and has been a member club of the Hungarian Speleological Society and the Association of Hungarian Nature Friends since 1995.

This exam is on their website (http://pizolit.hu/ei.htm). A number of the European, especially Eastern European, speleological groups are keener on this type of assessment and course than we are in Australia, where we have been more enthusiastic about peer review. Nevertheless, it is an interesting concept.

Apart from the actual Hungarian case studies, how would you go? There are several issues which are handled differently in Australia.

If you go to the website you will notice that this version has been "translated" into more colloquial Australian English, though much of the linguistic quaintness has been retained.

This is the first of a series of short "exams" in the next few issues of *Caves Australia.* This issue we look at technical knowledge. Answers will be given in the next issue.

However, I do NOT want a whole lot of people complaining that because this is printed here ASF endorses this procedure. Just because this is a sample of the way somewhere else looks at 'competence' does not mean that ASF is likely to set up a similar system here.

Certainly VSA does not want to go along these lines, and as training and leadership is currently organised at a club level, it is up to individual clubs as to how they want to organise these things. If your club wants an exam, here is a sample!

Exam themes for the first grade course in caving (theoretical knowledge)

Questions of basic knowledge are written in normal script, while those of supplementary knowledge are in italic script.

Note. If a certain subject is written as supplementary, it might still be a question on the examination paper.

We gladly appreciate any remark, advice or question concerning the material published below.

Compiled by: Szabó Bors

I. TECHNICAL KNOWLEDGE: MAIN PERSONAL EQUIPMENT

1. Which are the types of carbide-lamps?
2. Compare electric and carbide lights.
3. *Draw a carbide-container of open-system and describe how it works.*
4. *Draw a carbide-container of pressure equalising system and describe how it works.*
5. *Draw a carbide-container with air pump and describe how it works.*
6. *Draw a carbide-container with water-injection and describe how it works.*
7. Outline the requirements for main and secondary lighting.
8. Comparing it to the whole length of the trip, for how long should a main and a secondary light work? Why?
9. What is the contact zone? *What is it significant for and how does it work?*
10. What object can be kept in the contact-zone? Why?
11. What are the requirements for helmets?
12. In what cases does a helmet protect us?
13. What should the first-aid kit include?
14. On a caving trip of 6-8 persons, how many should carry a first-aid kit?
15. Why is it important for each caver to carry his own first-aid kit?
16. What is isolating foil used for?

II. TECHNICAL KNOWLEDGE: PERSONAL SUPPLEMENTARY AND COLLECTIVE EQUIPMENT

1. List the personal supplementary equipment for using the French technique.
2. List the collective equipment.
3. Why is the correct adjustment of equipment (harness, chest harness, double lanyard and leg loop) important when using the French technique?
4. Group descenders. Give examples.
5. Group ascenders. Give examples.
6. What are the characteristics of static and dynamic rope?
7. *What is the difference between climbing and caving ropes? Why?*
8. *What is the percentage of stretch of static and dynamic ropes? At what shock load?*
9. When do we use climbing ropes in caves?
10. What is the approximate breaking point of caving ropes?
11. How often and how should we clean ropes?
12. What type and what thickness of rope should be used for double lanyards? Why?
13. What type and what thickness of rope should be used as a prussik?
14. What are the characteristics of the MAILLON RAPIDE carabiners? What shapes can they be?
15. What materials are carabiners made of? What are the characteristics of each?
16. What kind of carabiner locks do you know of?
17. Group carabiners according to their shapes.
18. *What load can a PETZL ascender give to the rope without damaging it?*
19. *Why do climbing and caving harnesses differ?*
20. Which are the six knots we use most often? What do we use each for?

III. TECHNICAL KNOWLEDGE:
CAVING TRIPS

1. Group caving trips according to their difficulty.
2. What is a caving trip?
3. How many cavers should be on a caving trip? Why? When can we vary this number?
4. What are the personal requirements for a caving trip?
5. What are the three basic principles of caving?
6. What is the highest safety principle?
7. What is the agreement of objectives and possibilities principle?
8. What does the trip leader's personal responsibility mean?
9. What are the rights and duties of trip leaders and participants?

IV. TECHNICAL KNOWLEDGE:
CAVE BIVOUACS

1. What is a cave bivouac?
2. What equipment do we need for a bivouac?
3. *Describe the equipment needed for a bivouac.*
4. Why are sleeping bags stuffed with cotton/kapok unsuitable for a bivouac?
5. *What are the main factors when choosing a bivouac site?*
6. What foods should you take when on a bivouac?

V. TECHNICAL KNOWLEDGE:
HOW TO OVERCOME SHAFTS AND CLEFTS

1. *What is division? Why do we use it?*
2. *How many fix-points should be used at least when beginning a shaft?*
3. *What kind of natural and artificial fix-points do you know of?*
4. *What is the importance of an opening rein?*
5. *Why do we have to divide long opening reins?*
6. *How do we have to proceed on long opening reins?*
7. *Why is a tight rope bridge dangerous?*
8. *How can we increase at the same time the safety and feeling of security of a tight rope bridge?*
9. *What is the role of drags?*
10. *Why is it useful to divide deep shafts?*
11. *What is the minimal depth of a shaft, which needs to be divided?*
12. *How long should shaft sections be divided into?*

Caving in Tasmania

A few tips for visiting mainlanders

Alan Jackson
STC

MOST mainland cavers are under the impression that Tasmania has great caves; compared to the mainland that impression is largely correct.

The problem with Tasmanian caves is that they can be dreadfully elusive, spending most of their time hiding out in remote areas of the state cloaked in dense rainforest. Even the local cavers often spend a day locating their quarry before launching an underground effort the following weekend.

Visiting mainland groups that don't enlist local help usually spend the majority of their Tasmanian caving holiday thrashing through near-impenetrable scrub and failing to locate their chosen cave, or finding it so late in the day that there isn't time to enter the cave.

Some mainland cavers know exactly what I'm talking about. Here are a few tips for prospective mainlanders pining for a caving trip to Tasmania:

Contact the local caving clubs – Southern Tasmanian Caverneers for southern caves (principally Ida Bay and Junee-Florentine karst areas); Northern Caverneers and or Mole Creek Caving Club for northern caves (principally Mole Creek and Gunns Plains); Savage River Caving Club for Mt Cripps in the north-west of the state. Nobody knows more about Tasmanian caves than Tasmanian cavers.

Vertical Caves of Tasmania — A Caver's Guidebook was published in 1984 and isn't necessarily any longer the most up-to-date and accurate guide to Tasmanian caves. Major extensions have been made to many of the caves listed in this publication, most have been re-bolted, some have been gated or have had other access restrictions applied to them and all of them have seen nearly 30 years of forest growth which have altered track locations and conditions. This publication simply cannot be relied upon other than to give one an overview of what sort of trips are available.

Come prepared for local conditions and be realistic about your skills and abilities. All Tasmanian caves are cold (~7°C) and most are wet. Many of the caves are also vertical in nature and quite deep, requiring lots of SRT with technical rigging. Cotton overalls, when wet, are cold, heavy and potentially life-threatening. Cheap headtorches (and even many expensive ones) are not suitable for Tasmanian conditions – if you're not prepared to wear your headlight in the shower or drop it in a bucket of water for 10 seconds then it shouldn't be going underground with you.

If you've only ever done a handful of 40 m deep vertical caves in dry conditions and not prusiked with heavy bags full of wet rope, then be honest with your local guide (whose help you enlisted when you read tip number one above) and don't bite off more than you can chew.

I can't speak for the other Tasmanian clubs, although those members I've met seem mostly amicable, but STC is a friendly bunch of cavers who welcome visiting cavers and are always willing to help those who help themselves. Don't turn your trip to Tasmania into a disappointment — come prepared!

Armchair Caving

Susan White
VSA

FOR THOSE of us who indulge in armchair caving as well as more strenuous activities, there is always an interest in new books and additions of old favourites to our personal libraries.

Club libraries are always a good place to start reading about other people's exploits and expeditions.

As well the basics of caving, equipment, karst and more serious speleogenesis can be explored in the comfort of an armchair.

In poor weather in southern Australia, this is a more comfortable way of indulging in our passions for dark places.

This article was originally published in Nargun many years ago but has been slightly updated.

A number of new books on caving are always being published. There have been a number of postings about books for sale on ozcavers, e.g. Martyn Farr's new book Diving In Darkness and a few people have had some second hand books for sale or give away. For those of you who are trying still to build up your library, keep a watch for such postings on Ozcavers.

Club members sometimes have material for sale, and the various auctions for the Karst Conservation Fund are also good places to obtain material. The ASF library holds a limited stock of books.

The Encyclopedia of Caves and Karst Science (ed. John Gunn) was a huge project, now complete and available but very expensive. It is a useful book of information.

Beneath the Surface, edited by Brian Finlayson and Elery Hamilton-Smith (University of NSW Press) sold out its print run relatively quickly but is now available as print on demand. Details are available from the UNSW Press website.

Sources of caving and karst books can be the outdoors section of bookshops and there are some specialist sources.

The best known is the USA-based Speleobooks, which has an excellent website, and internet ordering system. Speleobooks is exclusively about bats and caves and has been in business for over 30 years. It has an easy but secure online ordering system with fast, personal answers to your questions.
The contact details are:
Speleobooks
Post Office Box 10
Schoharie, New York 12157-0010
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A list of useful books on caves and caving follows. Please note this IS NOT a complete bibiography, just a compiled list of useful material.
Happy reading!

REFERENCES IN KARST GEOMORPHOLOGY AND HYDROGEOLOGY

This is based upon original printed compilations by Ernst H. Kastning, Associate Professor of Geology, Radford University, with additional revsions by Ira Sasowsky and Paula Dungjen, Dept. of Geology, University of Akron. This list is from the Karst Waters Institute website wwwkarstwaters.org/geobibl

Items not available in English translation have been edited out but access to the full list is on the website. This, however, is rather short on Australian publications and I am trying to put one together. There are a few more recent publications but this is a good start.

INTRODUCTION

This bibliography provides a handy list of some important, standard references on karst and cave geology. Most works are in English, and this is not an exhaustive bibliography on the subject; however, it serves as a key to works that in turn lead the researcher to additional material.

The intent is to provide a selected list of primary sources to those who are relatively unfamiliar with karst research. Listings such as this one are inherently biased due to the background of the persons who compile them. Undoubtably many worthy publications have not been placed on this list. For this, we apologise, and hope that the presented list will be of use to those who view it.

The bibliography is arranged as follows:
1. Textbooks on karst and speleology: Monographs that introduce the principles of karstic landform development, the origin of caves, and the geomorphic, hydrologic, and geochemical processes of karst. Emphasis is placed on texts originally written in the English language or on foreign language books translated into English.
2. **Glossaries of karst terminology:** Dictionaries, lexicons, and other works that define terms applied to karstic features and processes. Several of these references list equivalent terms in several languages.
3. Bibliographies and indices of karst literature: Detailed bibliographic compilations and indices. These constitute the sources necessary to access the bulk of the karst literature, particularly the thousands of papers in journals, other serial publications, symposia proceedings, theses etc.
4. Gazetteers, atlases, and maps: Sources that place karst and caves in geographic context.
5. Proceedings volumes and collected papers: Significant monographs containing papers from conferences, meetings, and symposia that specifically address karstic phenomena. Principal English language volumes are incorporated in this listing.
6. Classical papers on cavern development and karst: References that are regarded as benchmark papers in the development of speleogenetic theory. These are frequently cited in subsequent papers on the subject.
7. Reviews on cave origin and karst: Papers that summarise, critique, and/or synthesise the cave or karst literature and provide an historical perspective to the development of speleology.
8. Modern approaches and principles of cavern development: A selected list of papers that, as a whole, typify current views on speleogenesis. Several of the papers discuss caves at specific locations or regions, but their inclusion herein reflects that they have a much broader application and are now considered as key references on speleology.
9. Journals on karst and speleology: A list of journals that regularly contain technical papers on karst, specialise in karst, or serve as newsletters or reviews on karst research.

CAVE SCIENCE

Textbooks on Karst and Speleology

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29th Biennial Conference of the Australian Speleological Federation Inc.

6th–11th January 2013: Galong, NSW
Hosted by the New South Wales Speleological Council

Notification and first call for presentations, papers, posters and workshops on any cave-related topic.

IF YOU have an interest in caves and caving the 29th Biennial Conference of the Australian Speleological Federation (ASF) is an event not to be missed.

The organising committee invites you to get along to TROGalong, at the St Clements Retreat and Conference Centre, Galong, NSW from Sunday 6th to Friday 11th January 2013.

This national conference provides an ideal forum for anyone with an interest in the science or exploration of caves to share in the knowledge, research and exploration experiences of Australia's caves and karst landforms.

International presenters will also be most welcome. Presentations will be variable and nominally of 20 minutes' duration, although longer presentations may be negotiated. Absentee presentations may also be accommodated.

Posters are encouraged and will be displayed throughout the duration of the conference.

Artists are also welcome to present cave related artwork (commission applies to any sales).

Be sure to enter the cave photography competition, speleo sports and prusik events.

Experience some of NSW's tourist or wild caves on the pre and post conference field trips.

All accommodation, meals and conference events will be on site so there will be lots of opportunity for socialising and relaxing. The venue has comfortable motel style accommodation with some limited camping option, an in-ground swimming pool and extensive gardens set on the peaceful 800 acre rural property with a rich pastoral history dating back to the 1820s. The venue was also a former monastery and minor seminary.

Further details on costs, closing date for abstracts, program and events will be advised shortly. Please visit www.asfconference.org.au/2013 for more information and registration details.

Students, researchers and speleological club members are strongly encouraged to submit presentations or workshops on any cave-related topic.

The ASF administers a small grants scheme to encourage attendance at and active participation in ASF conferences by new ASF members who have not attended any previous ASF conference.

The grant provides for whole or part remission of conference registration fees and travel costs etc., and personal attendance and an appropriate presentation is required.

Enquiries to the conference organising committee are invited.

Please contact the conference convenor, Bob Kershaw, in the first instance: rkershaw@ozemail.com.au

Vale Paul Devine

AUSTRALIAN caving lost one of its great explorers and palaeontologists when Paul Devine died recently in the bush in southern Queensland.

During the early 2000s, Paul Devine was an active member of the Speleological Research Group of WA. He was a prolific locator of caves on the Nullarbor and singlehandedly added several hundred karst features to what was known on the Nullarbor, using aerial photography to narrow his searches. Paul discovered several very significant caves on the Nullarbor.

In 2002 Paul was on an expedition to the Nullarbor and discovered Leaenas Breath Cave. This cave is one of the most significant palaeontology sites in Australia and has produced remains of several extinct species, which are wonderfully preserved. Paul was an integral member of subsequent palaeontological expeditions to the cave and contributed much to the understanding of the history of this and other sites.

CLAY BRYCE

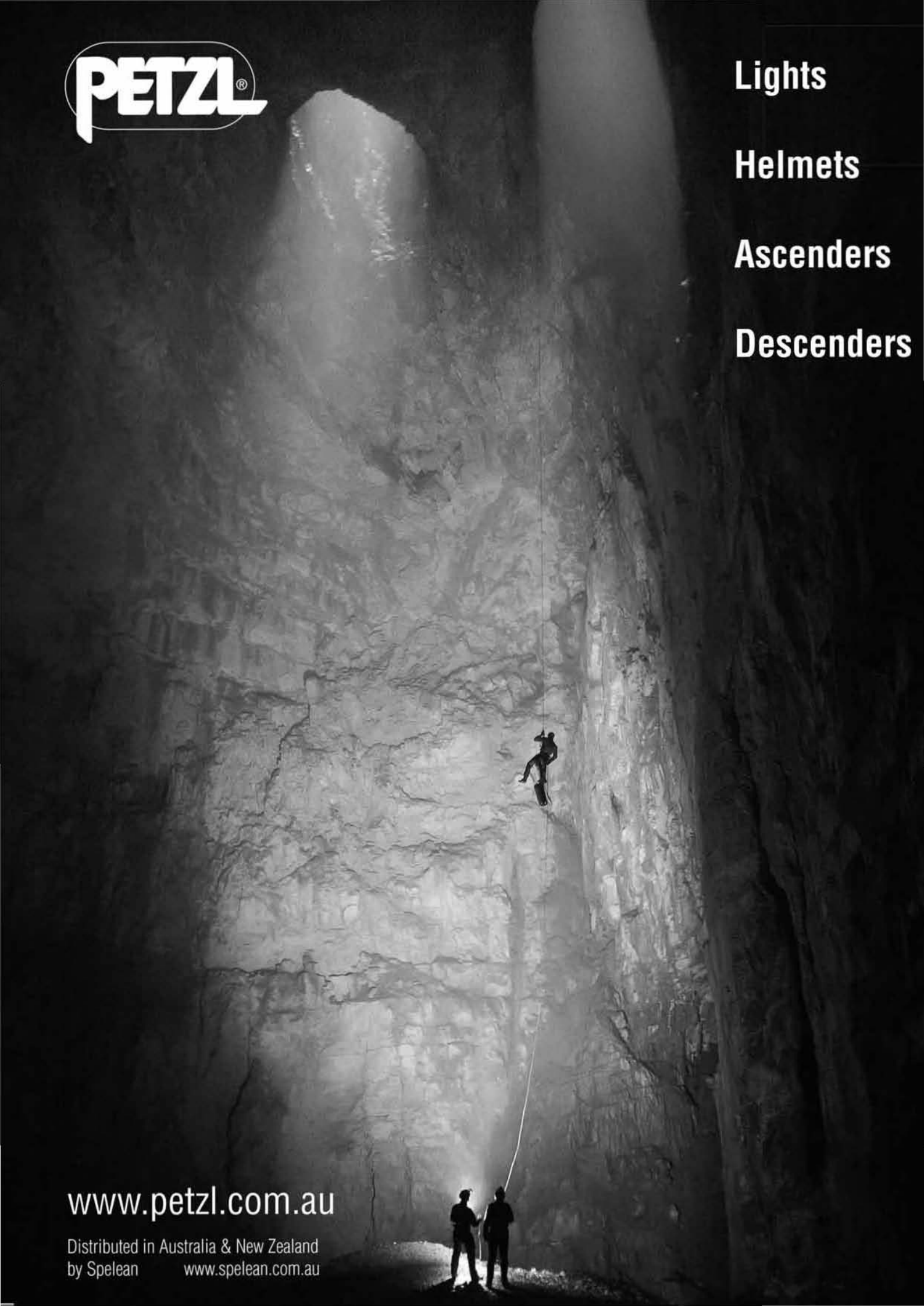
Paul and Eve work on recovering bone remains from Leaenas Breath cave

Paul appreciated fine detail and a challenge — when a group of cavers found Kija Blue in Northern WA, and the location was not released to others, Paul was noted to have identified the entrance to Kija Blue and forwarded the location to one of the trip participants. Not a bad feat considering the thousands of square kilometres of country that would need to have been searched.

After finding Leaenas Breath Cave, Paul, Eve and their two children moved to Queensland but continued to work with Gavin Prideaux in the uncovering of more of Australia's underground secrets.

Sadly, Paul leaves behind Eve and their two children, Wesley and Kayley — our hearts go out to them in this time of pain. Together we grieve the loss of a wonderful person who left this world too soon.

— Jay and Ross Anderson, Gavin Prideaux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