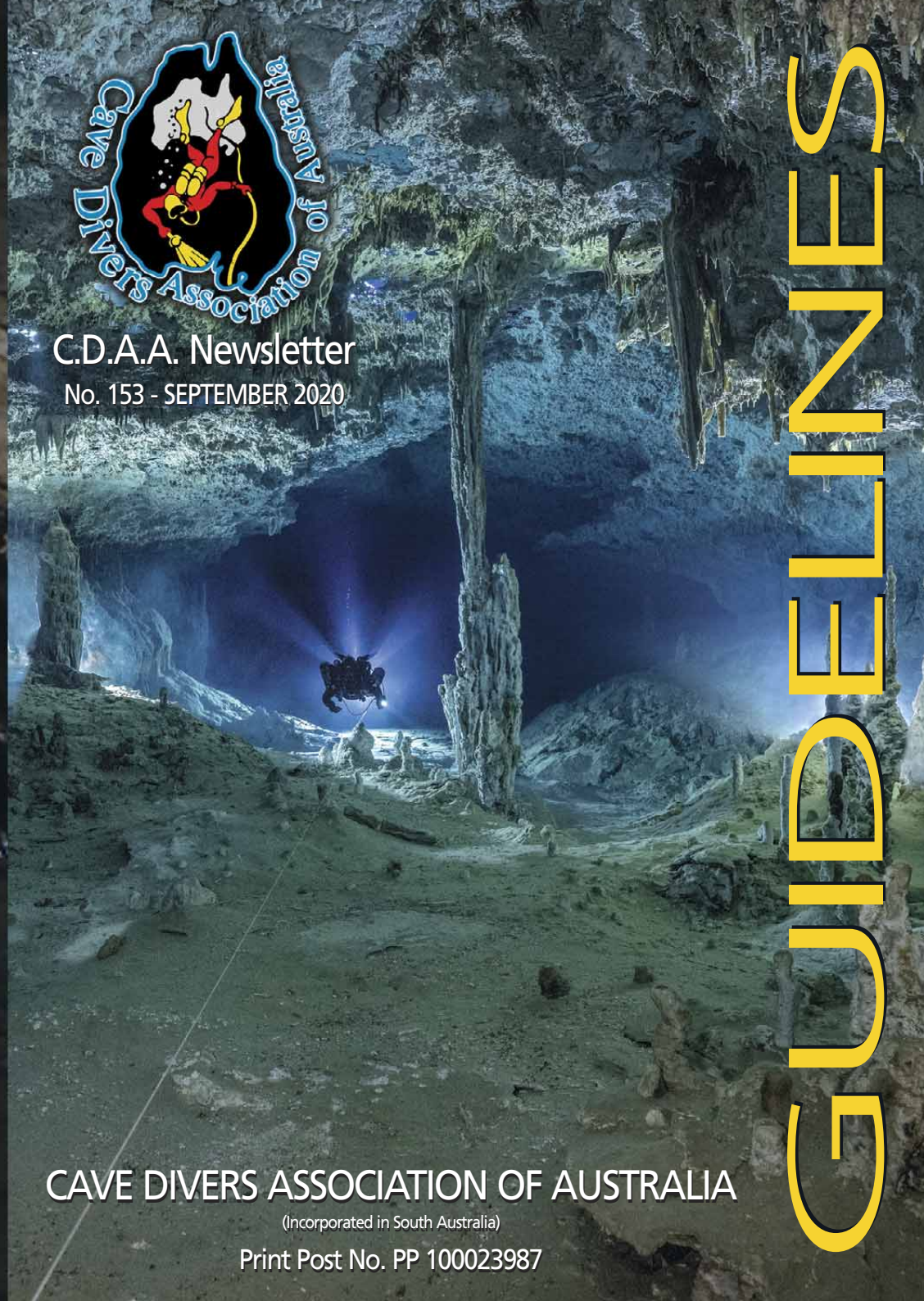




*About to descend at Nettlebed, December 2019. Divers are Graeme Sanson and Matt Aisbett.
Photo by Josh Richards*



C.D.A.A. Newsletter
No. 153 - SEPTEMBER 2020



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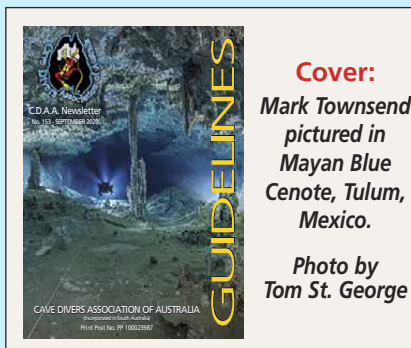


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CAVE DIVERS ASSOCIATION OF AUSTRALIA

ABN 65 062 259 956

P.O. BOX 544, Mt Gambier, SA 5291

GUIDELINES is a newsletter of the Cave Divers Association of Australia. All articles for the following issue are to be sent to the Publications Director, Email: publications@cavedivers.com.au

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Photo by Liz Rogers

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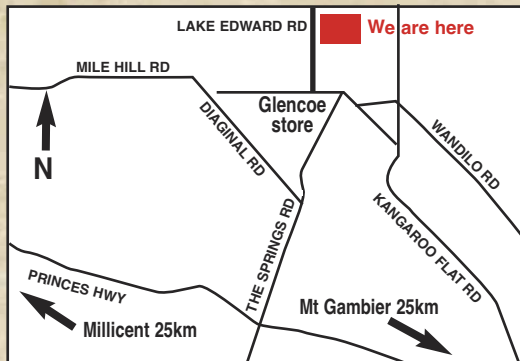
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PUBLICATIONS REPORT

MEGGAN ANDERSON



Well I wish I could say things were looking up for all of you cave diving wise compared to three months ago but sadly that is not the case. Living in South Australia, I do feel extremely grateful every time I head down to the Mount and go cave diving. One silver lining to this is that the reduction in traffic has made a considerable difference to the caves conservation wise, their condition is amazing at present and they are clearly benefiting from their little rests.

I want to thank you all for renewing, even though many of you are dealing with border closures and lockdowns and are thus unable to dive. Our membership numbers have remained similar to last financial year as a result. There were a handful of people who wanted to explore their options and it was hard to know what to advise people at the time as things were constantly changing. The majority however renewed with no questions asked, which leaves me with the assumption that we have a largely loyal membership base who want the association to remain strong. We are not charging any late fees for this financial year so if you have friends who have held off please communicate this to them. If for some reason you wish to change from a diving membership to a non-diving membership because your circumstances have changed, then please get in touch with me to discuss further. I also want to thank Brendan for his work during the busy renewal period, we did have some hiccups along the way.

As you would know from an email I sent, our website and back office functions require an upgrade. 3 members with IT skills have committed to helping me with this large undertaking, for which I am extremely grateful. I will be addressing more of this in my annual report, which is also due this month and in further email communications.

This issue is the AGM issue, unfortunately COVID-19 means our symposium is cancelled so it makes for a more subdued issue than usual. Once again thank you to our advertisers and contributors.

Finally I want to acknowledge Joseph Monks as he reaches the end of his term as Standards Director. Thank you for your contribution and all the best for the future.

Stay healthy and stay safe!

Meggan Anderson #4942 | Publications and Records Director
M: 0415 291 904 | E: publications@cavedivers.com.au

Articles for Guidelines Dec. 2020 - Deadline is Nov. 10th

- Send articles and jpeg images by email to guidelines@cavedivers.com.au

Did you know?

You can opt for an electronic copy of Guidelines rather than a paper copy. Simply login to your CDAA online account, select the dropdown menu under the My Records tab and click on Update My Details. Handy for those who have multiple CDAA members in their household or for those wanting to do their bit for the environment!

NATIONAL COMMITTEE UPDATE

SEPTEMBER 2020

Hope you are all as well as can be!

First off, I'd like to extend my sincere appreciation to all the members who contacted us with messages of support in response to the June edition of Guidelines. Knowing that so many members share our concerns, care about the CDAA and the cave diving community as much as we do, and appreciate our efforts, makes a world of difference!

As this will be the final edition of Guidelines leading up to our upcoming election period, I would like to take this opportunity to thank both Mary-Anne McLeod (Business) and Joseph Monks (Standards) for their efforts thus far. The last 12-18 months have been extremely challenging, and the way you have both conducted yourselves and dealt with those challenges is worthy of utmost respect. The CDAA and its members have benefitted greatly from your respective contributions. Mary-Anne has committed to nominating for another term. I'm unsure if it's because we're so awesome to work with or if she is just a glutton for punishment. In any case, Mary-Anne brings a wealth of knowledge, professionalism and expertise to the role of Business, and I look forward to working with her for another term.

While Joseph has decided not to stand again, I would like to extend my sincere appreciation for the way he has navigated the role of Standards. Joseph always strives to do his best for the instructors and students and make sure their courses run smoothly. Thank you for your unwavering support and your friendship over the last couple of years. I look forward to working with you as you see out your term and wish you all the best for whatever challenge you decide to tackle next!

To the two members who have nominated for

the role of Standards – Tim Featonby and Ryan Duchatel – I applaud you for stepping up to the plate. Good luck with the upcoming election, and we look forward to having the successful candidate on the team.

To all our members - with any luck, I'm hoping that the worst of COVID-19 will soon be behind us and we can resume some degree of normalcy. To those of you that have been able to squeeze in a cave dive in relative peace and quiet – enjoy it while it lasts! You can rest assured that us Mexicans will be descending upon Mount Gambier and the Nullarbor en-masse as soon as we are allowed to cross the border once again.

In the meantime, stay safe.

Peter Wolf
CDAA National Director



*On behalf of the
National Committee*



Mary-Anne McLeod,
Business Director



Kelvyn Ball,
Site Director



Joseph Monks,
Standards Director



Meggan Anderson,
Publications and
Records Director

SITE REPORT

KELVYN BALL



Such tricky times with COVID19 regulation changes happening regularly and albeit suddenly at times. Lucky is the diver that has gotten to dive recently whether just open local water to keep the skills up or even luckier the cave diver that has been able to dive in open sites.

I have been keeping in contact with our landowners around the country to see who is able to be open and who is not.

CLOSED SITES are: The Shaft, Kilsby's, Engelbrecht's East and West.

OPEN SITES are: Ela Elap, Bakers, Tank Cave (max 6 divers) Allendale (max 2 divers) Little Blue, One Tree, DEW sites and Forestry SA Sites. WA sites are open to WA residents only at this stage.

Please check current regulations for all sites when booking on. Especially Forestry SA as their regs have changed very recently. Also keep in mind

each state's travel restrictions that are changing all the time. I am still looking for a NSW State representative if anyone is interested in the role. You can give me a call for details.

Sending thanks out to new ACT State Rep Ryan Post for taking on this position and also to Cathy, Mark and Damo for joining me on a site management committee. Bit tricky at the moment for me to get to SA but hope I can rely on all members to keep sites clean and tidy and to let me know of any issues that arise.

AGM not far away, so yearly report will be out soon. Hopefully we can all be diving together again soon in the sport we all so enjoy and to have a good community catch up.

Cheers

Kelvyn Ball

Cheers Kelvyn Ball – Site Director

STANDARDS REPORT

JOSEPH MONKS



Hello Team,

I hope everyone is staying safe and well in these challenging times we are all currently facing.

There is not a lot to report from the standards and teaching side of the CDAA at the moment although we have run a few courses in Western Australia, South Australia and New South Wales. This is fantastic as it shows that even when faced with adversity our instructors can be relied upon.

I would like to take this opportunity to congratulate everyone in the CDAA for your patience and understanding while access to

the sites is limited, the sites will all still be there when this situation finishes.

This will be my final Director's report, I would like to thank everyone who has supported me throughout this journey. For the members running for the Standards Director position, I wish them the best of luck and I hope the CDAA grows stronger under their guidance. I hope everyone manages to navigate through this pandemic safely and return to diving the caves as soon as possible.

Dive safe and within the standards!

Joseph Monks #4653

Standards Director



It has been an even more challenging last quarter as the impact of COVID-19 has escalated, particularly for our Victorian members.

Whilst planning for the AGM symposium was in full swing, due to the recent surge in COVID-19 cases and the escalation of lockdowns and border restrictions across the country, I am really disappointed that the Symposium will not proceed this year. Whilst we want to support the Mount Gambier community and spend time with our fellow members and guest presenters, it is just not logistically possible. Therefore, it is time to put the backup plan in place.

The AGM itself will go ahead on Saturday 24th October, so I hope many of you are able to join for that. There will be details on proceedings, but I expect it to be a Hybrid model – delivered online, allowing attendance for all Members and Directors in conjunction with a physical meeting in Adelaide, if restrictions at the time allow. Full details will be provided as soon as possible.

Following last year's successful implementation, the 2020 elections will be via electronic vote. We have the following to vote on:

- Standards Director (2 nominations)

- Business Director (1 nomination – therefore no vote required)
- Life membership (2 nominations)

Detailed procedures on how to vote will be provided via email shortly.

The 2020 Financial Statements and 2020 Budgets will be made available prior to the AGM. Please take the time to review these, and contact me if you have any questions.

Normally we would have merchandise available at the symposium, instead our Products Officer will be organizing another bulk order – the new hoodies proved to very popular last time! Please keep an eye over the next couple of months for an update.

As the only nominee for Business Director, I look forward to continuing to support the association. Joseph Monks has decided not run again for Standards Director, so I'd like to farewell Joe – thanks for your time and dedication to the position.

Mary-Anne McLeod #5011
Business Director

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Members Symposium Cancelled

The members symposium has been cancelled for 2020
due to the current COVID-19 restrictions.

AGM TO PROCEED:

Sat. 24th October 2020

The Annual General Meeting will commence at 11.00am,
and complete no later than 12.30pm.

The AGM will be conducted via an online platform in conjunction with
a physical meeting held in Adelaide (pending restrictions at the time).
Further details to be issued via an official notice as soon as possible.

For any questions, please contact **Mary-Anne McLeod** (Business Director)
at business@cavedivers.com.au or **0401 508 838**

ADSF Grant – Search and Rescue Equipment

Richard Harris SAR Officer #1360

I was recently alerted to a grants program run by the Australian Diving Safety Foundation (adsf.org.au), an Australian based health promotion charity which evolved from the Divers Alert Network Asia-Pacific. The foundation's main objective is to "Promote the prevention and control of diving related diseases and illnesses in human beings, including but not limited to decompression illness." John Lippmann who many of you will know, heads up the foundation. The ADSF Diving Safety Promotion Grant Scheme aims to encourage appropriate diving safety educational and safety promotions aimed at preventing diving-related accidents, and reducing the impact of related illness and injuries. The application was for investing in vital equipment to facilitate ongoing training (e.g. SROP courses), to prepare for a rescue and to allow early notification of the need for the rescue.

The result of the application; \$15,000.00 to spend on equipment and the organisation of sump related rescue. Whilst the equipment will be owned by the CDAA, it could and should be made available for any cave or sump rescue incident in Australasia if required. The approved items for the spend are:

- Regulators, switch blocks and quick disconnects for the two Interspiro Divator Full Face Masks (FFMs) already purchased.

- OTS Buddy phone comms for the two masks. This can be used to communicate with and reassure the injured caver.
- Cave Link communications devices x 2 (see below)
- Pelican cases to protect the equipment.

The Cave Link (cavelink.com) is especially exciting. I first became aware of this technology about 6 years ago in New Zealand as it has been used there in cave rescue for some time. It has now become the standard for through ground communications in such incidents. Essentially it is a messaging device communicating between two or more units, using a simple keyboard. For example, when we tested a unit (owned by Flinders Uni Speleological Society) from Toad Hall last year, we could send a message back to a mobile phone at camp, but also to a phone in Adelaide! Importantly, the receiver does not need to be manned constantly as messages are stored and can be checked



anytime. This also makes recording and logging communications much simpler. The units are probably too expensive to be kept at the Cocklebiddy Roadhouse like the current through ground radio, but will be made available to anyone visiting Toad Hall. You can imagine the time and worry that will be saved if someone has an injury in Toad. No need to send a diver out to call for help. Medical advice from a capital city via text message. The possibilities are endless. And in the event of a major incident, other devices can be networked and set up at the Rock Pile, Entrance Lake etc etc.

I am currently working with the directors to work out the best place to store all the SAR equipment, maintenance schedules and so on. But this is an exciting development for our SAR capability and the equipment will all be used and demonstrated during SROPs. Sadly due to COVID, a SROP course may not be able to run this year, but we are considering options.

Thanks to John Lippmann and the ADSF, and to Jane Bowman for bringing it our attention.

Stay safe,
Harry

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CAVE DIVERS ASSOCIATION OF AUSTRALIA
NATIONAL COMMITTEE ELECTIONS
OCTOBER 2020

STANDARDS DIRECTOR

Nomination for Standards Director: Tim Featonby #3372

Proposed by: Linda Claridge #2214 Seconded by: Andrew Ottanelli #4943

NOMINATION STATEMENT:

I started diving in 1984 and have been cave diving for over twenty five years with qualifications from CDAA, NACD, NSS-CDS, IANTD & TDI. In addition, I have 25 years of instructional experience with the CDAA, SSI, HSA, IART, DAN & TDI. My experience includes training development, interpreting and applying legislation and running a Registered Training Organisation.

Currently I am a member of the the Australia Cave & Karst Management Association, and the Australian Speleological Federation. In order to further my knowledge of caves, I gained a degree in Geology and in Palaeontology and am on the long road towards a PhD in cave geomorphology. It has been a privilege and honour to be able to dive in our beautiful sites, and I have gained a great deal from being a member of the CDAA. I would like to give something back by putting my hand up for the job of Standards Director. I feel that my experience and passion provide me with a good foundation in order to fulfil this position.

My secret agenda (don't tell anyone!) is simply to continue the good work of the CDAA and to allow all of our members to continue the privileged opportunity to safely dive these wonderful sites.

STANDARDS DIRECTOR

Nomination for Standards Director: Ryan Duchatel #4983

Proposed by: John Wilson #4283 Seconded by: Lindsay Scott #5352

NOMINATION STATEMENT:

As a passionate member of the CDAA, I would like to nominate for Standards Director of the CDAA. I have been heavily involved as a member of the CDAA over the last several years, including as the NSW state representative, an avid cave diver, and a CDAA basic cave instructor intern.

For the past 4 years I have been the NSW state representative for the CDAA, organising the NSW event for AGM invited speakers: Andy Pitkin, Don Shirley, Michel Vasquez and Patrick Widmann. In addition, I have organised training opportunities for NSW members in rope access and organised diving access for members and visitors, whilst regularly contributing to state rep discussions.

I am currently a technical open circuit and JJ-CCR rebreather instructor under DiveRAID, and have been a professional member of a number of diving agencies in Australia including PADI and SDI/TDI, giving me an understanding of current teaching and professional diving standards across the scope of agencies. I hope to continue my involvement in diver training as a CDAA basic cave instructor once I complete all intern requirements.

Lastly, I love cave diving. As a resident of NSW, the 15 hour drive to Mount Gambier and 30 hour drive to the Nullarbor is daunting, but the feeling of freedom and unparalleled quiet inside a cave is worth the effort one thousand times over. I hope to use the role of standards director to share my love of cave diving with others, and help people continue to do this safely.

CAVE DIVERS ASSOCIATION OF AUSTRALIA
NATIONAL COMMITTEE ELECTIONS
OCTOBER 2020

BUSINESS DIRECTOR

Nomination for Business Director: Mary-Anne McLeod #5011

Proposed by: Brett Harris #4713 Seconded by: Meggan Anderson #4942

NOMINATION STATEMENT:

As a Chartered Accountant and an avid cave diver, having held the position of Business Director since 2018, I now wish to nominate for the role in the upcoming election and continue my contribution to the CDAA.

I have a diverse corporate and consultancy background, and have held senior finance positions in a wide range of industries. I am currently Financial Controller and on the Executive Team of a global design and manufacturing company in the marine and aviation industry. I hold a Bachelor of Commerce (Hons) and an MBA from Melbourne Business School, and am also a member of the Institute of Chartered Accountants.

As a National Committee we have individual roles, with my focus on the financial side, however we work as a team. As part of that team, I will continue to pose questions that challenge both my own thought processes and my fellow directors, so that as a Committee we make the decisions to best represent our members and that upholds our constitution and regulations. With recent developments in cave diving in Australia, we have some unprecedented challenges facing the CDAA and I want to work through this with committee and members to strengthen our association – I believe in the CDAA, it's relevance and importance to cave diving and its members.

I am passionate about cave diving and would be pleased to bring my knowledge and experience to the National Committee to help further the Association for its members.

Mary-Anne McLeod has stood unopposed and has successfully been elected for the position of Business Director.

CAVE DIVERS ASSOCIATION OF AUSTRALIA LIFE MEMBER NOMINATIONS

The National Committee has motioned to adopt the following nomination for life membership:

Nomination for Life Membership - Linda Claridge # 2214

Proposed by; Joseph Monks #4653

Seconded by; Kelvyn Ball #3276, Peter Wolf #4419, Meggan Anderson #4942, Mary-Anne McLeod #5011, Damian Bishop #4738

NOMINATION STATEMENT:

Celebrating 30 years in the CDAA, Linda joined in 1990 and that says it all. Linda has a name much larger than here small person. If you have been in the CDAA for more than 1 day I am sure you have heard the name Linda Claridge. At the celebrations of the CDAA 40th (2013) we published the statistics of the instructors and Linda was at the top with 468 students trained and that's a whopping 9% of all the members ever in the CDAA!! Linda is a quiet person by nature and is normally seen with her partner Gary Barclay around Mt Gambier all year round. While she is quiet in voice I can assure when she does talk it is worth listening to as she has a vast amount of knowledge and as said above she is more than happy to help train and educate the new generation of divers and does not look like slowing down. Linda Joined the CDAA on the 21/07/90 completing her Cat 1 (deep cavern/sinkhole, Basic cave) with Anthony Richardson, then Cat 2 (Cave) on 06/05/1992 with Ian Lewis and finally Penetration (Advance cave) 10/10/94 with Chris Brown. After that Linda was off in the cave not wasting any time. It only took a year before Linda was wanting to become an instructor. While Linda did not set out to become an instructor the CDAA has benefited tremendously from this. Linda was the first Female to Teach at the CDAA top level form many years. Linda and her Partner Gary Barclay have been some of the very few instructors to teach the CDAA course in remote places like the Nullabor (WA). From all accounts that has been a great success as they have been doing this for many years and continue to plan more for the future.

Linda has been a very big part of the CDAA for many years not just as an instructor but as the Records officer 1994-200 Standards Director 2010-2014 and finally Site Director as interim to help the sitting National Committee.

Linda has been on may big project with the CDAA with mapping and exploring like, Vanuatu, Black hole (1994), Pines, Bullocks hole, Little Blue, Kilsby's (2007), Blue lake (2008), Piccaninnie Ponds (2009) and many more.

Linda is one of these rare people who has a passion to succeed in life and if there is no path to follow forge her own. We the CDAA have benefited in more ways than I can mention from this person's actions and guidance over the years. It is said that we place our future in the hands of the next generation and Linda has been there to make sure they are steady hands. Our future looks bright! I would like to Thank you on behalf of my position as Standards Director, the past and present National committees and all the members of our great cave diving association. Without people like you we would not be where we are today.

There is a Bio for Linda in Guidelines No.131 March 2015 if you would like to read a Q&A from Linda. I thank you for your consideration of Linda Claridge #2214 for life membership.

Regards Joseph Monks #4653

Life Membership voting:

Voting will be conducted via Electronic Ballot.
Instructions will be sent via Email to Members.

CAVE DIVERS ASSOCIATION OF AUSTRALIA LIFE MEMBER NOMINATIONS

The National Committee has motioned to adopt the following nomination for life membership:

Nomination for Life Membership – Gary Barclay #1735

Proposed by; Kelvyn Ball #3276

Seconded by; Joseph Monks #4653, Peter Wolf #4419, Meggan Anderson #4942, Mary-Anne McLeod #5011, Damian Bishop #4738

NOMINATION STATEMENT:

I, Kelvyn Ball #3276, would like to nominate Gary Barclay #1735 for life membership.

Gary had his first dive experience in 1985, when he and his partner, Linda Claridge hired some tanks (with a basic webbing harness) and regs from the local service station. Off they went to a local beach to give diving a go. Gary must have been hooked, because not too long after this he decided to do his diving course and get qualified.

Over the next few years, Gary (and Linda) did many dives in the ocean, but as those in South West Victoria know well – you can't always get into the ocean around here. Gary (and Linda) would often jump into the car and head over to dive Ewens Ponds on a Friday night after work.

This was not too long after the 1984 double diving fatality at Piccaninnie Ponds and Gary recalls initially being hesitant about getting involved in cave diving. Finally, on the 15th of April 1989, he made the leap into cave diving, completing his CDAA Cavern Diver certification with local Portland instructor Frank ZEIGLER. He followed this with his CDAA Sinkhole Diver Certification on the 5th of May 1990, CDAA Cave Diver on the 4th of May 1992 with Ian Lewis and finally CDAA Penetration Diver on the 12th of July 1993 with Greg Bulling.

Since then, Gary has continued his involvement with the CDAA, becoming a Deep Cavern instructor in 1998 and progressing through to Advanced Cave Instructor in 2001.

Over the years, Gary has completed two terms as Site Director and also as a Shaft Access Officer for many years.

Gary (and Linda) have been doing regular trips out to the CDAA sites on the Nullabor, clocking up in excess of 20 trips over the years. These trips have not been all been for fun – with many CDAA courses taught on the Nullabor.

Over the 22 years Gary has been an instructor, he has been involved in the training (either as instructor or assistant instructor) to many students, too numerous to count.

On a personal note – Gary is a great bloke and will do anything he can to help you out. He is a wealth of knowledge on all things cave diving related and has always got time for a war story or two.

Some things you may not know about Gary Barclay:

- Involved in surveying and mapping projects in The Blacks Hole in 1993 and The Bullock Hole in 1996.
- Involved in first underwater live video at Allendale Cave in 1994 to support Port MacDonnell 125th Anniversary.
- Involved in the mapping of Pines Cave in 1995
- Exploration cave diving trips to Vanuatu in 1996 & 1997, where new caves were explored.
- Involved in Kilsby's Sinkhole mapping project in 2007
- Part of Blue Lake Scientific Sediment Sampling and Research Program in 2008
- Involved in the mapping of Piccaninnie Ponds during 2011..

Gary has been a huge advocate for encouraging new divers and then helping them step up through the levels of Cave Diving in Australia. Always ready to have an energetic chat with his wealth of knowledge of past history and input in future projects or changes. It is with great pleasure that I recommend Gary Barclay for Life Membership in the CDAA.

Diving the Ojamo lime mine in Finland

138 meters of water, 4 degrees Celsius

Text by Antti Apunen. Photos by Janne Suhonen

Imagine sub-zero temperatures and a hole in the ice. That is your entrance to the underworld of Ojamo, the most popular diving site in Finland.

Ojamo lime mine is situated 60 kilometers west of Helsinki. It attracts thousands of visits every year. The mine area is part of the city of Lohja, known for its industry.

The mining operations were started in the 18th century. When the open pit got too deep, mining was taken into the tunnels.

More technology was introduced to boost the human powered operations. Ojamo mine was a key development driver for the area for decades. It fueled the local economy and provided work for the locals.

When Finland entered the war with Russia in 1939, the mine was turned into a prison camp. The prisoners worked in shifts and lived miserably in tents at the bottom of the open pit. There weren't enough clothes for everyone, so the prisoners exchanged mantels between the shifts.

Today, as the water has filled the mine, it seems

just like another small lake inside the forest. The shallowest tunnels start at the depth of 28 meters, from the bottom of the open pit.

The mine reaches the depth of 250 meters at the bottom of the main mining shaft.

The exact depth is not known as there was some landfilling into the shaft after the mine was closed. The deepest recorded dive has been done to the 160 meters.

The water level reaching the ground level makes diving easy at Ojamo.

Divers can park their cars next to the lake and jump into the water. In many places, like the popular Tuna Hästberg iron mine in Sweden, the gear needs to be

lowered deep into the mine tens or even hundreds of meters with winches before reaching the water level.

The huge mining halls are quite an experience. I remember vividly my first dive into one of



A 28 metre drop in a ventilation shaft

these huge cathedrals. My hands started moving in circles, as if I was falling down from a cliff. The crystal clear water and dark depths deceive the eye of the inexperienced. When in operation, the mine has not been a place for a person with bad nerves or phobia for heights.

The halls are sometimes so big that no walls can be seen when crossing them. The only guidance is the white line running through the emptiness.

These chains of halls can be quite confusing. In a natural cave it's sometimes easier to remember details. In a mine, the mechanical marks of mining seem all the same.

A country without natural caves

There are many kilometers of tunnel at Ojamo, although the longest continuous stretch is only

1.7 kilometers, at the 88 meter level.

There's also little variation in depth on each level, the tunnels run almost horizontally. There are plenty of shafts and mining halls that are used for travelling from a level to another.

All this makes planning dives easier than in a natural cave, as the multi-level plans can be reasonably accurate compared to natural tunnels going up and down all the time. It means that there are no reverse profiles either.

In Finland, there are no natural caves suitable for diving. The ground is solid granite, which is too hard for water to carve underground rivers. Even the lime stone at Ojamo is tightly squeezed inside the hard rock where the carbon dioxide cannot eat its way through the stone. From the mine diving point of view, granite has many benefits. The corridors and



Historical image of workers in Ojamo Mine



Preparing to dive Ojamo Mine

vast halls are stable even without supporting structures. There are many closed mines suitable for diving in Finland. Many of them have been closed only recently, or there is no required diving infrastructure for various political or geographical reasons. One example of these kinds of sites is the Outokumpu mine, the name known globally because of the mining company that started its operations from the very spot. Today, Outokumpu is one of the leading stainless steel and copper manufacturers in the world. For divers, the name means multiple kilometers of unexplored territory. Many of the mining sites are in remote places. This means that their number of visitors is low compared to Ojamo, even when they are otherwise quite suitable for diving. One of the popular sites, Montola, was closed for a while because of a recent fatality, one of the few ones in the short history of Finnish cave diving. The Montola accident is a typical cave diving



Lucifer's pillar supports the Hell's gate at 75m

accident, added with local environmental characteristics. The water in the open pit was very murky, with only a summer time visibility of one meter or so (during winter the water is clearer, as there is algae in the water). The visibility probably played a part in the accident, as the team members got separated and did not recognize the shortest way out, even that the entrance was never very far. So even in mines with almost no flow, the circumstances can be treacherous..

Great halls of dark granite

Ojamo mine has been dived for almost 40 years. The mining came to an end in the mid-1960's. The market price for lime had gone down and there was no financial point in continuing the operations. As the mine was closed, it slowly started to fill with water. With many kilometers of tunnels, it took quite a many years before the water reached the ground level. The good news was that the mine was filled with ground water, which had been filtered by the thick top soil and gravel. The water inside

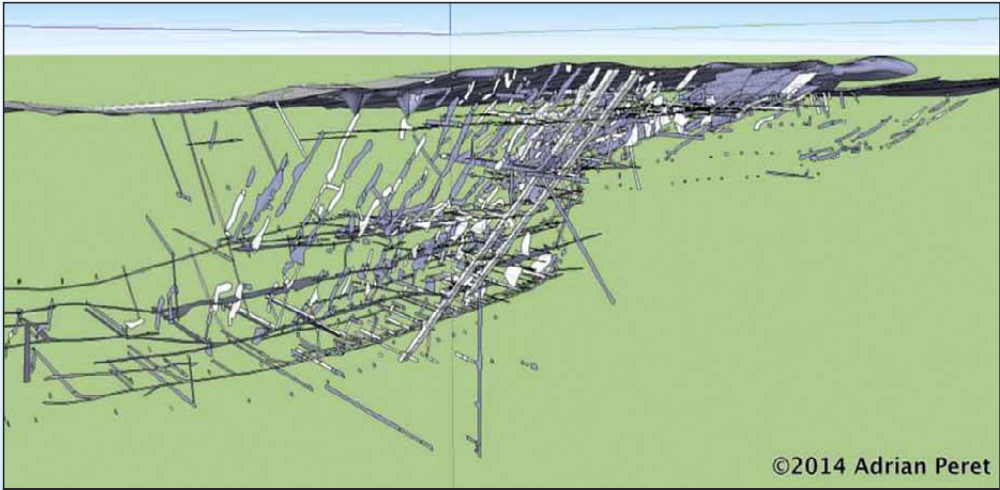


Exploring passageways in the mine

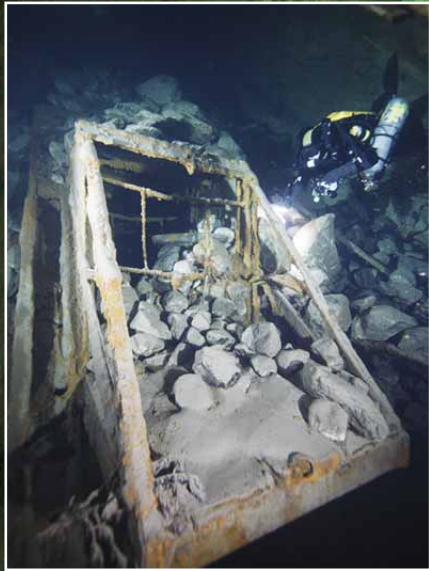
the mine tunnels was crystal clear. The northern lakes mostly lack large mammals and other animals, but perches, northern pikes and burbot quickly populated the open pit and its murky waters. The crayfish followed soon after. The early attempts to explore the mine were restricted by the primitive cave diving equipment. Finland was far away from the influence of central European and North American cave diving communities. The diving was done mostly in Baltic Sea by military and professional divers, and they were not too interested in exploring in the mine very deep. Their techniques and equipment were tuned for wreck diving and typically lacked the redundancy and capabilities required for deep cave diving. In the beginning of 1990's the mixed gas technical diving started to take hold. First non-military rebreathers were imported close to the turn of the millennium. That was also the time when the cave diving training became more popular among Finnish divers. Before that, the local rules and personal relationships mostly dictated who could dive and where. The first expeditions charted the mining level at



Location of Ojamo mine on global map and map of Scandinavia



A 3-D image reveals the web of numerous mining tunnels and halls



Background image:
Mario world is one of the most
visited areas of Ojamo Mine

28 meters. The largest part of the level became known as the Pearls, as 13 big mining halls are connected to each other with narrow passages. The level was suitable for open circuit nitrox diving, so it was mapped quite quickly.

The next step was the 56 meter level. Air was still the most common diving gas, so the level remained well inside the air diving limits. It was explored all the way in the beginning 1990's. The dives were considered remarkable by the standards of the time. Today, with all the rebreathers around, these two-three hour dives don't seem anything but ordinary.

The major limiting factor at Ojamo has always been the cold water. The constant 4 degrees Celsius at the bottom makes sure, that any dive over three hours is always a bit of challenge. Today, the heated vests and the fixed habitat make things easier. But even now, five or six hours in the chilling water can be torture, not to talk about if anything goes wrong with the suit. Dry gloves are imperative. Wet gloves simply can't protect against water that cold for hours.

The traditional Finnish style is to dive with thick, custom made rubber suits. These Loitokari suits

are a Finnish phenomenon, which often amuses foreign divers. But there are certain advantages. The rubber suit seems to be almost impossible to tear. Remembering the cold water, this consideration is quite important.

Scooting around the forest

Some exploration was done at the 88 meter level at the early days, but the exploration came to a halt when the practical limits for open circuit dives were reached. It took a few years before the rebreather diving techniques were updated to the requirements of 88 and 138 meter level push dives.

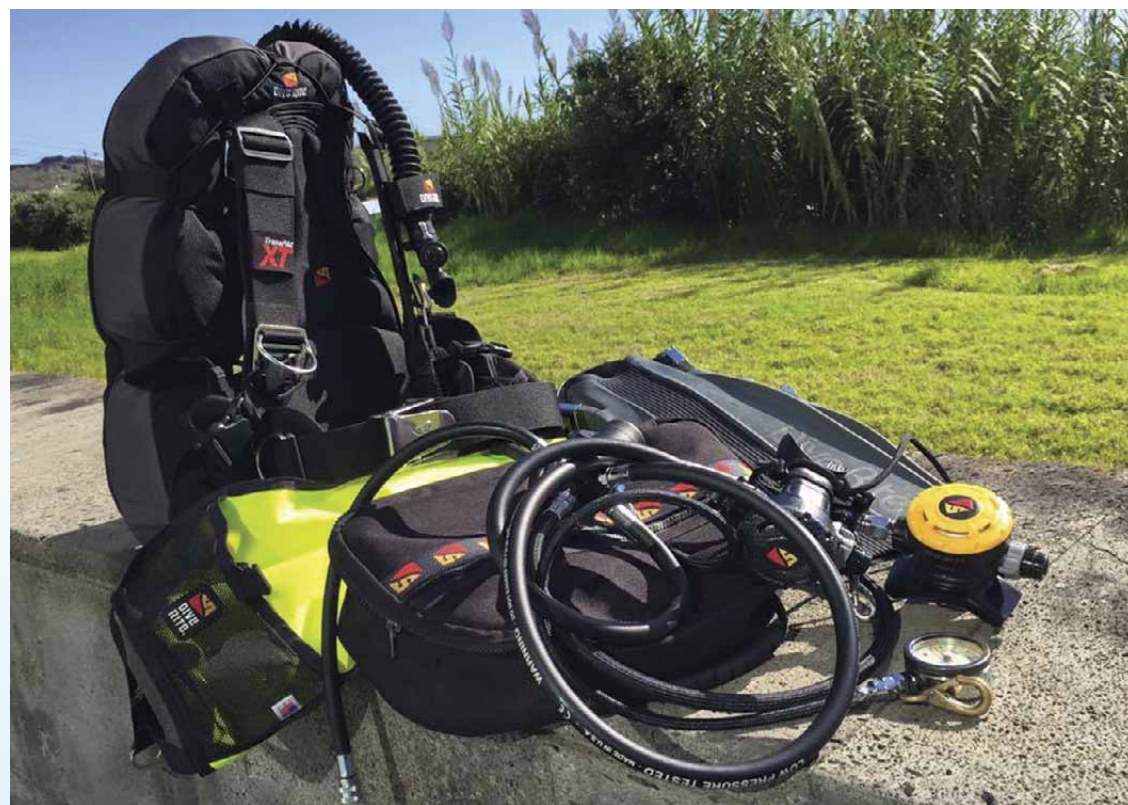
The 88 meter level was explored all the way to end beneath the Lake Lohja at 2008. After that, the focus has been on the 138 meter level. There are still plenty of tunnels to explore. Most techniques are similar to diving in natural caves. Divers follow maps when they dive in natural caves, unless exploring. Similarly, in a mine you typically have quite a clear idea of the routes, as the mines are well documented. Of course, the maps don't reveal everything, and the 3-dimensional reality is often surprisingly different from the old drawings.



Exploring the workshop at 88m level

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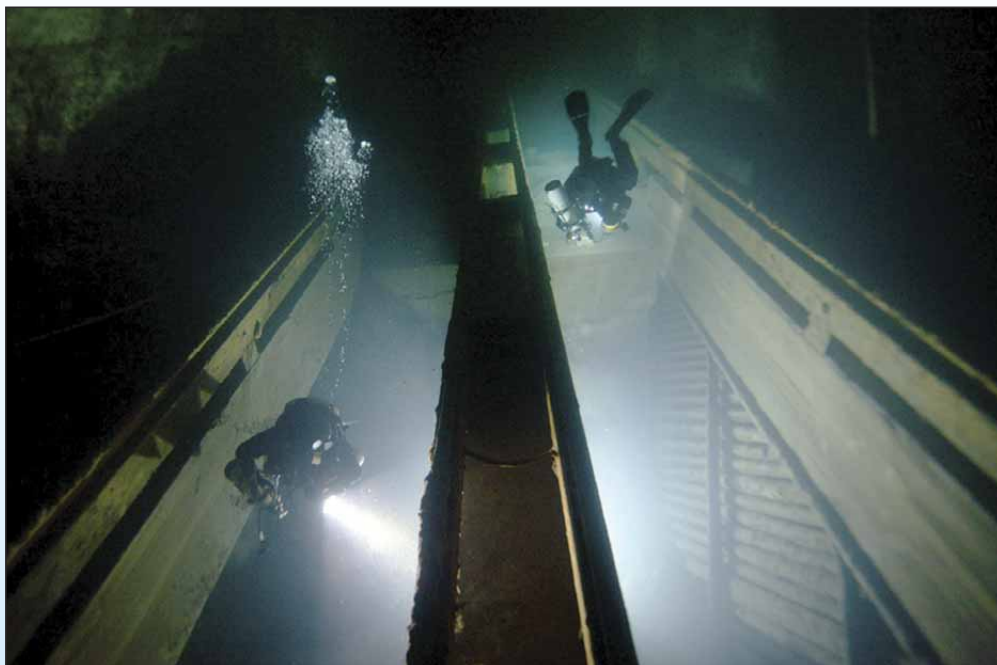
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Old mining cart at the 138m mining level is still waiting for the next load



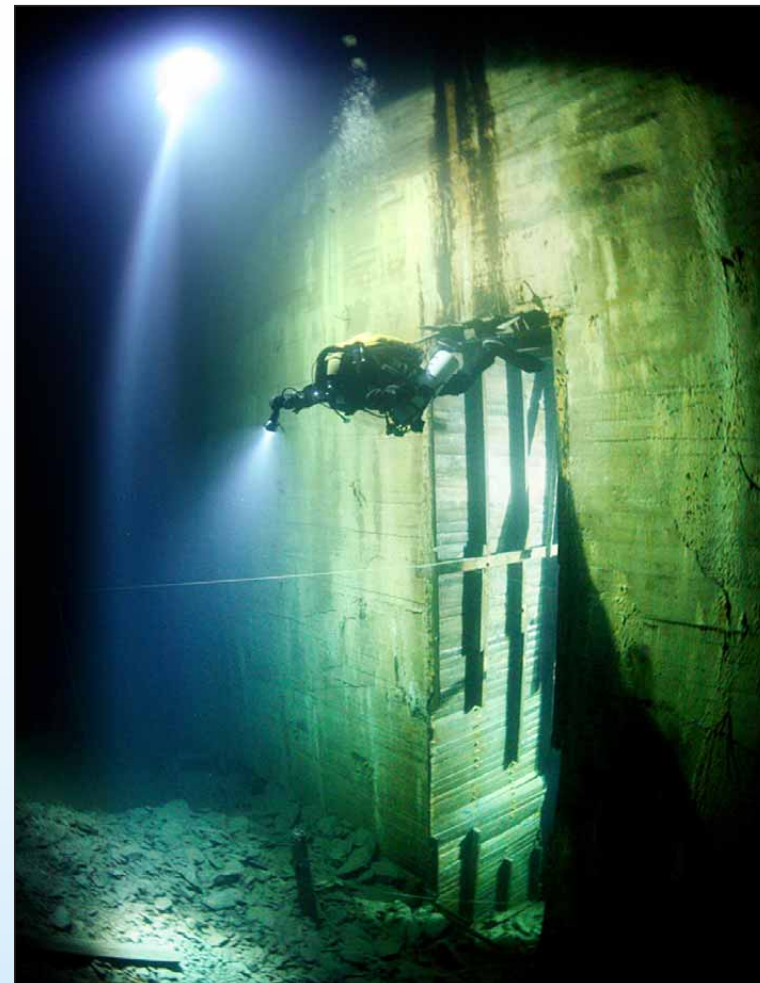
Personnel elevator shaft at 56m level

The conditions in a mine don't vary much. The temperature is constant at depth. Only the surface water in the open pit warms up in the summer time, to about 20 degrees Celsius. Finns mostly use argon as the dry suit gas. Bigger molecules seem to insulate better, although there is no precise scientific evidence supporting the habit. Staying warm is the main priority on any dive. Even just one hour in cold water, unprotected, can be fatal or at least a main contributor to DCS.

There are no currents, and the visibility at depth rarely changes. The surface water is a different story. During summer it's all murky. The visibility

drops to a meter or sometimes even less. Even that the decompression hours are warmer, the zero visibility poses a different challenge.

There is silt, as in the natural cave. With no current, the ceiling in the previously undived sections can release plenty of silt when hit with bubbles. The mine is full of signs of the human presence. Tools have been laid down where the work was last performed. The rails and mine wagons still seem like they would be waiting for another cargo to take to the surface. At 138 meter level nothing has been touched. Layer of silt covers everything, but you can still recognize most details.



Hell's Gate was built to support rock between the mine and the lake bottom

The light bulbs hang from the ceiling, as if the lights would soon be turned on again. The hammers wait for their users. The neatly piled dynamite boxes seem like they were set there yesterday.

In the open pit, the trees still stand. During the winter, when there is an ice cover on top of the lake, the light makes its own tricks. It is a wonderful scooter ride through the silent forest. It makes the long and cold decompression hours easier to manage.

Hammers wait for their users. Neatly piled dynamite boxes seem like they were placed there yesterday.

In the open pit, trees still stand. During the winter, when there is an ice cover on top of the lake, the light plays its own tricks. it



The Hell's Gate is an often visited structure at 45 meters.

is a wonderful scooter ride through the silent forest. it makes the long and cold decompression hours easier to manage.

For more information about Ojamo mine and the authors, please visit:

Diversofthedark.com.

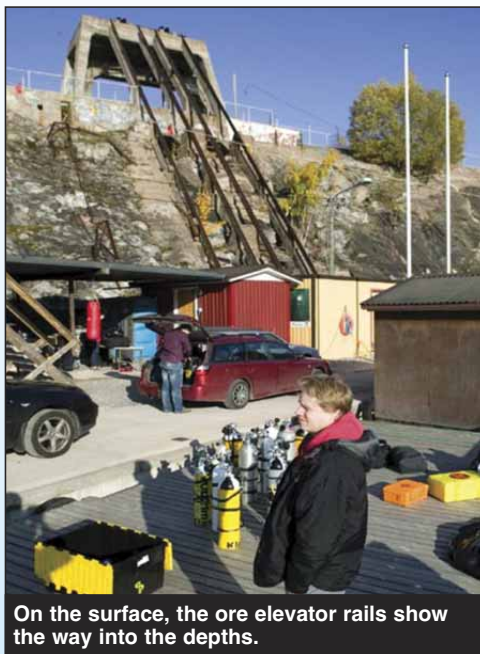
ABOUT THE PHOTOGRAPHS:

- The photographs in this article were originally part of the documentation project that led to a book, Divers of the Dark. The major challenge was getting good photos of big spaces and deep levels. For example, the single shot from 138 meters required more than 12 hours of in-water time for each team member.

- As in any cave, many formations and spots have friendly names among the divers. Hell's gate is a structure 10 meters high. It supports the bottom of the Lake Lohja. As the story tells, the miners once were almost drowned because of a calculation error that took the drill too close to the lake.

- Underneath the gate, there's a place at 75 meters called the Lucifer's Pillar. There a rock is held at place by a rusty wire, next to a sup-

porting pillar to the structure keeping the Lake Lohja away from the mine. According to the legend among divers, the whole mine would collapse, should the pillar come down.



On the surface, the ore elevator rails show the way into the depths.

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Life History of a Fossil

By Julien Louys

So, I found some fossils in a cave. What's going to happen to them? Where will they go? Why should I care? As part of my job, I'm incredibly lucky that I get to travel all around the world looking in caves for fossils.

Sometimes I get lucky and even manage to find some! But the process from finding the fossils, to studying them, and finally unveiling them to the world, is not something that we often discuss. Not because we have anything to hide, but because it's the part that isn't as glamorous or exciting as finding or announcing – it's making the sausage. Most of my work takes place in dry caves, but the process is the same for flooded caves – albeit with that extra added spice and complexity that comes with having to dive for the fossils.

Finding fossils is the easy part. Mostly, all that's

needed is some patience and whole bunch of luck. Identifying and analysing them after they're found is when the hard work begins. According to dinosaur expert and curator of palaeontology at the Smithsonian Institute, the late Nicholas Hotton III, the first thing one should do on finding a fossil is to 'sit down and have a smoke'. Things have moved on since 1965 when those words were written, but the sentiment is still relevant today. The first fossil found is rarely the only fossil found. Taking the time to step back, look around, and see what else might be around has often produced many more, and sometimes



more important fossils. The other reason we need to take a step back at this point is to evaluate the context the fossils are in.

Context is very important for two reasons. First, we need to be aware of everything around the fossil that could be important for understanding and studying it. What other fossils are around it? Are they associated in any way? A skeleton that's in a fully articulated anatomical position will have formed under very different conditions than a pile of mixed-up, broken bones. As importantly, material surrounding the fossil can be used to date the fossil itself. Methods like Optically Stimulated Luminescence (OSL) dates the last time the sediment around the fossil was exposed to sunlight. Uranium Series (US) dating can be used to work out when speleothems around the fossils formed: if the speleothem lies on top of the fossil, the age of the speleothem provides a minimum age for the fossil.

Second, we need to decide how best to extract

the fossil without damaging it. Typically, fossils in caves are found either in unconsolidated sediments, much like the many fossils that can be seen in Fossil Cave and the bones lying on the floor of sites like Kilsby's and even Gouldens; or they can be found in lithified deposits known as breccia. In dry caves, removing fossils from loose sediment requires us to build plaster jackets around them, while fossils stuck in the walls requires more persuasive techniques (hammers, chisels, and even drills). Before we even start on any of these, however, we'll take extensive field notes noting the relative position of all the objects of interest, and many photos and videos recording the undisturbed deposits.

Once all these details have been recorded, and the fossils and other samples successfully extracted (and placed in labelled bags – there's nothing worse for a palaeontologist than seeing an unlabelled bag!), things move from the field to the lab.



The lab is where the preparation, processing, sorting, analysing, and description takes place. Fossils are prepared out of their plaster jackets using air scribes and drills. They are etched out of the breccia with acid and water. Any sediment collected around the fossils is sieved for small fragments or pieces of microfauna that aren't visible in the field. These are sorted through, and the important or interesting pieces put aside for closer examination. We often have to consolidate or treat the fossils to make sure they don't break or disintegrate. The fossils and other material are sampled for further tests, such as geochemical and geochronological tests, with these subsamples sent to specialist laboratories around the world. Finally, the fossils themselves are identified and described. Most palaeontologists carry around in their heads a

set of pictures of different bones and teeth of different animals and try to match the fossils to those images, honed through years of study and experience. Often, we need to use comparative specimens in our collections or in museums. Sometimes we must visit interstate, or even international museums to find the right material to compare fossils to.

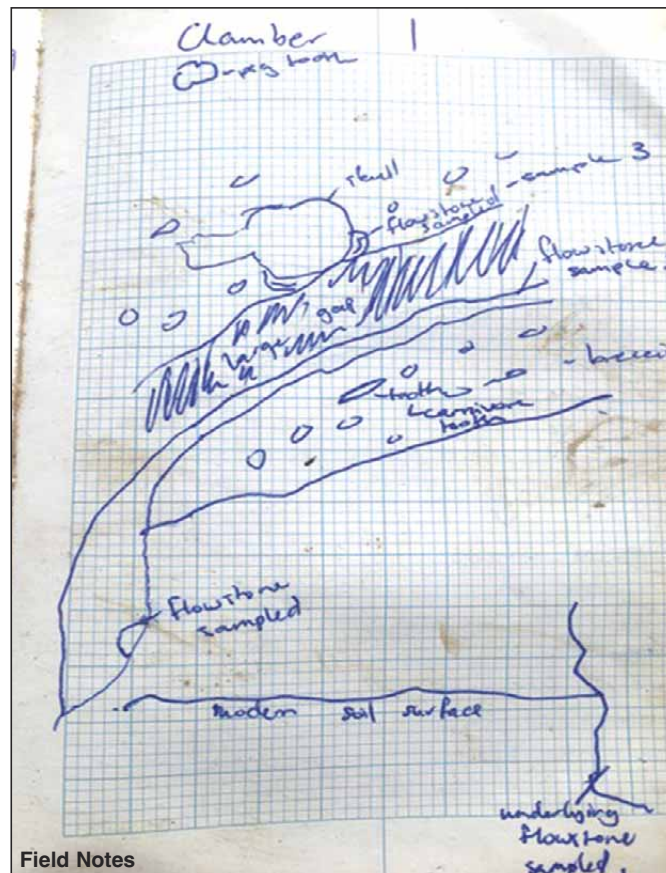
The description and cataloguing of fossils can be a laborious process, especially if there are many fossils to analyse. We note anatomical features, any evidence of disease, any marks on the bones, how complete they are, and so on. All this information can help us reconstruct the animals that were present, their environments, how they got to where they are now, and any other questions we might be interested in. We gather as much data as we can, from as many different

sources as we can. This process can take months, oftentimes years. Once we've extracted all we can from the fossils, they are deposited in a museum so that others can also study them, or so that they can be put on display for everyone to enjoy. This is a necessary step for palaeontologists, as we are not allowed to publish until they have been registered in a bona fide institution.

Once we've gathered all the data, and we think we understand what the significance of the fossils are, we describe this in technical reports published in scientific journals. Before they can be published, these reports are heavily scrutinised by our peers, who try to pick holes in our arguments or flaws in our thinking. It's only once our manuscripts have passed this vigorous vetting process that our findings can be published, and the discoveries announced to the world.

Back to Mount Gambier

So, what's been going on in Mt Gambier, and how far along in this process are the fossils that have been found so far? The first fossils collected from Mt Gambier (from the 60s until the late 80s) are housed in the South Australian Museum and have already been the subject of several papers. Copies of these papers can be found online, or you can contact me if you're interested. Recently, my team and I revisited some of these fossils, and sampled them in order to find out how old they are. We're still working on writing up these results. Fossils that were extracted from Fossil Cave since the late 80s by a team that included professional palaeontologists and the CDAA are largely housed in the palaeontology laboratory of



Flinders University in Adelaide. They were the subject of a Bachelor honours thesis and are currently awaiting further study.

More recently, a former member of the CDAA extracted some fossils from Fossil Cave and was instructed to turn them over to the Department of Environment, Water and Natural Resources. These were then passed on to a representative of the South Australian Museum, where they will be registered. They consist of an adult mandible of *Procoptodon gilli*, an extinct megafauna kangaroo (Gill's Short-faced roo), that was unfor-

tunately broken into two clearly matching parts. There was also the left and right pre-maxillae (snout) fragments of the skull with incisors, also recently broken. These almost certainly belonged to the same individual, and based on the nature of the breaks, it's likely that the rest of the skull should be nearby. Unfortunately, no notes regarding where it came from are available. Nevertheless, these fossils belong to an unusually very small, but adult form of *Procoptodon gilli*. Is it small because it's a female? Or could it be a new subspecies of Gill's Short-faced roo?

These are some of the questions we'll try to answer going forward.

The fossils in the Bone Room remain where they were found and protected for now, but they will be the subject of ongoing investigations. With these fossils, we're still very much at the 'sit down and have a smoke' stage of the process. However, once the borders and the universities open up again, we'll begin making plans for their recovery, as well as the recovery of all the contextual information we can. This will be a lot trickier underwater than in the dry caves I'm



used to working in. But part of the fun in cave diving, at least for me, is trying to devise solutions to the technical challenges that underwater work brings. I won't be able to do it alone, and I look forward to working with as many of you as possible in our ongoing work in Mt Gambier and exploring its unique ancient environments.

Lake Surprise 2013 Mapping Report

By Stephen Fordyce

Party: Stephen Fordyce, Patrick Fitzgerald

This represents another thing which should have been published a long time go (silver linings of global pandemics). A long time ago, Pat heard a rumour that there was a deep shaft at one end of Lake Surprise – a crater lake in the middle of Mount Eccles (now Budj Bim National Park), in Western Victoria. Possibly the source was a university study, maybe it was an eccentric old fisherman, but the gist was that this shaft may reach depths of 80m! Miscellaneous cursory research was conducted and an enjoyable if hard yakka weekend was spent sadly disproving this idea beyond any reasonable doubt.

I should probably warn you now: don't get excited about new cave diving opportunities – as far as I know there's no limestone, and only a few dry lava tube caves.

With some cobbled together gear, we paddled a canoe all over the lake collecting 4000

GPS/depth points and verifying the maximum depth to be about 12m, right in the middle, just as a pessimist might expect.

We had brought a whole lot of dive gear (I can't remember, but I think Pat managed to convince my enthusiastic younger self that bringing trimix just in case it "went" was not necessary) so weren't going to leave without having dived the deepest point. It was a weird and scary dive, with thermoclines, pitch blackness, 1m visibility and hydrogen sulphide – we could smell a strong odour of rotten eggs in our mask at the bottom. A layer of what felt like ash but probably wasn't covered the bottom – it wasn't dense enough to be solid, and if you touched it with a knee, merely a ghostly resistance was felt. It settled very quickly though.

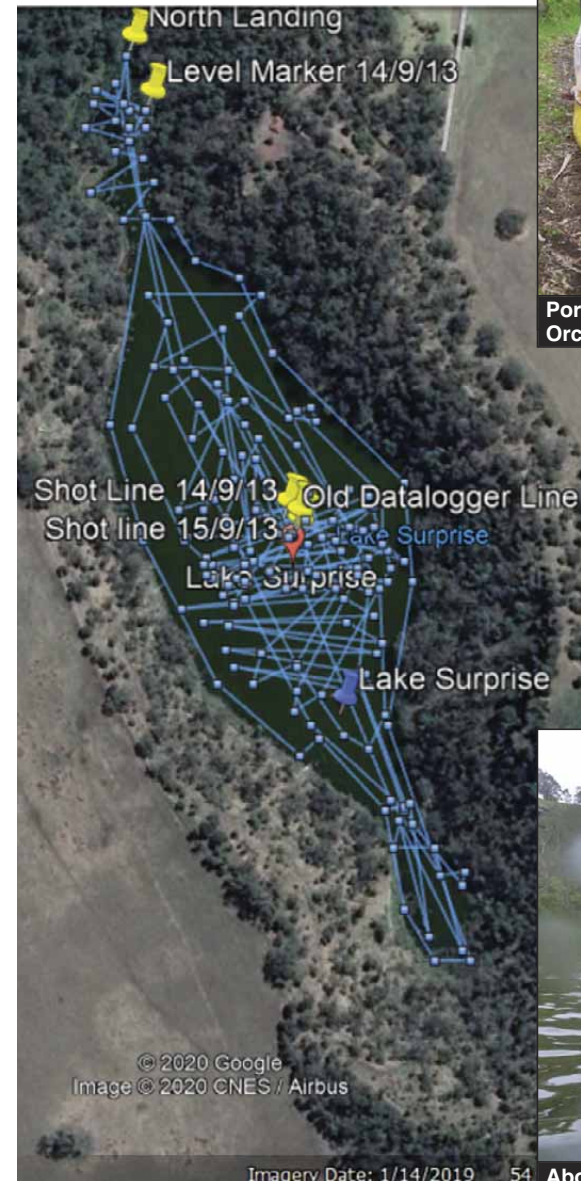
Since we were there and could well have been the only time



Electronic surveying paraphernalia and my younger self

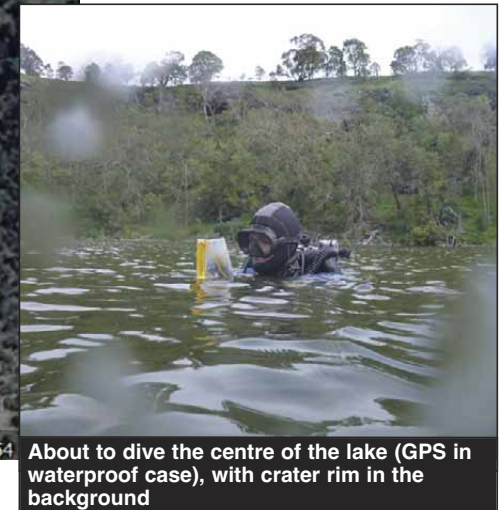
anyone was idiotic enough to dive the site, we did an expanding circle search pattern on the bottom and discovered a rope heading up towards the surface, but which didn't quite reach. There was a "Hobo" brand datalogger attached – likely a remnant from a previous

study we could not identify, although the manufacturer kindly downloaded several years of temperature data for us (and I have kept a copy).

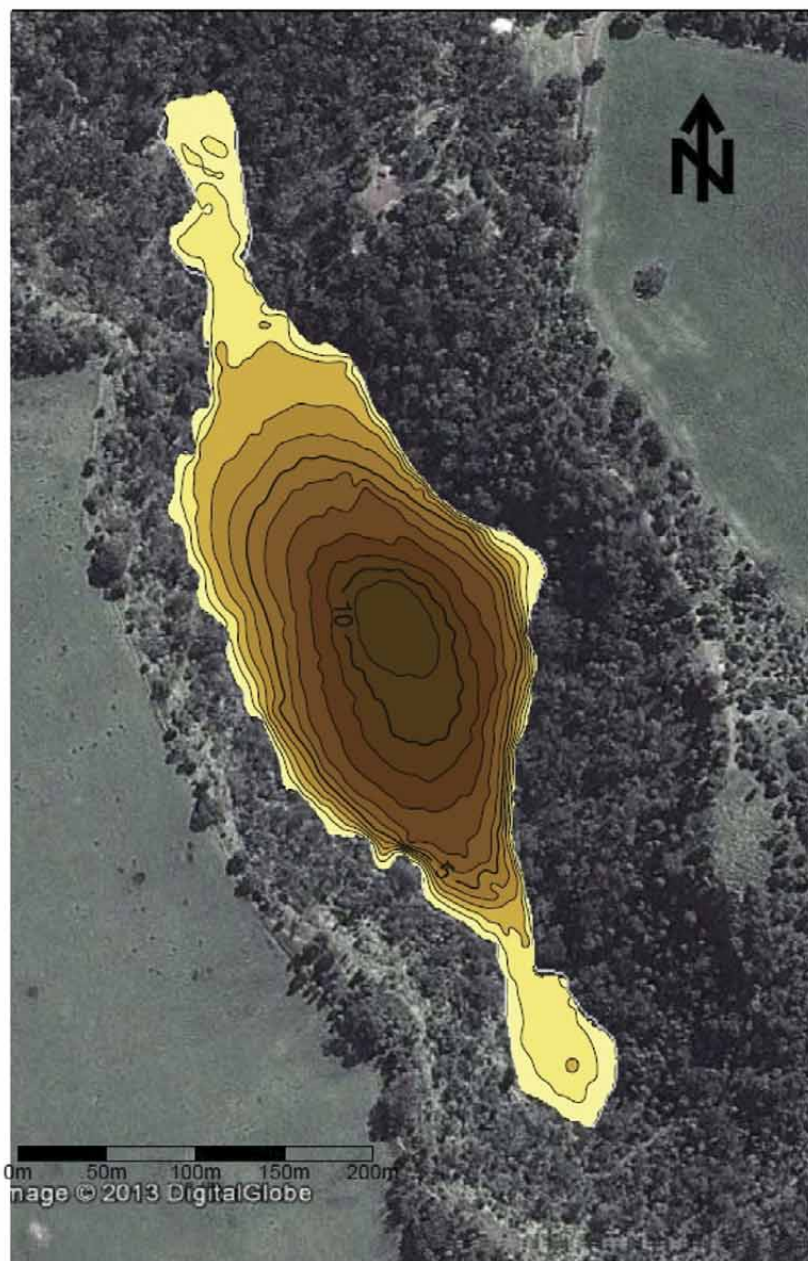


Portaging our survey vessel "The Orca" to the water

Our canoe tracks and other points of interest on the lake



About to dive the centre of the lake (GPS in waterproof case), with crater rim in the background



Project Research & Conception by Patrick FitzGerald
 Data Collection by Stephen Fordyce & Patrick FitzGerald, 14/7/13
 Data Processing & Cartography by Stephen Fordyce
 Copyright Stephen Fordyce 2013

The depth map generated from our data (don't get excited about jagged lines and apparent features – they are artifacts of inaccurate data)

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Cautionary Tales - Quick Disconnects

By Richard Harris #1360

In my view the most important incidents are ones that can recur and so by discussing them, we can help save other divers from the same fate. I have chosen to recount 3 separate close calls, all caused by the same problem, all happening to close friends. The theme is the use of quick disconnects (QDs). The names have been changed to protect the innocent!

Incident 1:

I was diving in a deep cave in Australia with a good friend Bob. Our plan was to explore a new section at over 100mfw so we were both wearing back mounted CCRs with sidemounted bailout cylinders. A shotline from the surface lake had additional bailout cylinders strung on it. Bob had his left bailout connected to his CCR by a Swagelok QC6 QD which was supplying diluent to his bailout valve and the rebreather's automatic diluent addition valve (ADV) via a manifold.

Unbeknownst to Bob, his rebreather was slowly flooding during the early part of the dive. At 30m, we prepared to enter the first vertical section of the cave. After giving Bob a final OK signal, I headed down the shaft leaving him to follow. Bob rolled head down to follow, and suffered a caustic cocktail as water in the unit came up into this mouth. He immediately went into a head up position and switched his bailout valve over to open circuit. Unfortunately no gas was forthcoming! Back onto the loop to try and clear the flood and get some gas but only caustic water came from the mouthpiece. At this stage the rebreather was getting heavier and Bob started to sink. He grabbed for the regulator on his sidemounted tank but it did not come straight to hand. In a last-ditch effort, he sprinted up to the shot line and grabbed a bailout regu-

lator. By the time I realised Bob was not behind me, the crisis was over and I ascended to find him happily coughing on the staged bailout cylinder above me.

Subsequent inspection of Bob's equipment found that the QC6 has popped apart, despite initially working for the first part of the dive. A very close call.

Incident 2:

Another cave, another good friend. Don and I were exploring a very long Australian cave with large crystal-clear tunnels. We had surfaced in a remote dry chamber, got out of the water for a period of time and were just starting the dive back out of the cave. Don was diving a manual sidemount CCR. A side mounted cylinder supplied both the ADV and BOV on the unit via a QC6. We both submerged to about 3m and started to scooter through a lake area towards the overhead section of the tunnel. As Don started to scooter he suddenly found he could not fill the loop from his ADV. As he sank further, he switched his BOV to open circuit to find he had no gas there either. Still sinking, he tried to fill the loop with his oxygen addition but the flow was insufficient to give him enough volume to breathe. I watched this evolve and had deployed a second stage to offer Don. Unfortunately, he didn't see it. Instead, close to panic and with no

time to grab another second stage, Don aimed his scooter straight up and burst out of the water less than a meter from the overhead part of the tunnel. He was coughing and wheezing for nearly 30 minutes afterwards. Had we been 5m further into the tunnel he may not have survived. The cause? His QC6 QD had separated.

Incident 3:

Third friend, different cave. Sam was diving a manual sidemount rebreather using QC6 QDs to connect both his diluent (from a side mounted cylinder) and his oxygen (from a small cylinder attached to his CCR). On the surface, Sam successfully tested his oxygen manual add valve (MAV) before climbing down a ladder into the cave. On the surface, he noted his PO2 to be on the low side but decided to descend a few meters to get out of his buddy's way due to the cramped conditions at the entrance. Once down to 6m, he stopped to recheck his PO2 and add more oxygen. But no oxygen was forthcoming. Sam checked the oxygen cylinder valve which seemed to be on. He put a hand on the QC6 which felt correctly aligned, bungied to the side of the rebreather. Unclear as to why he couldn't top up his O2, but now looking at a PO2 of 0.19, he decided to ascend the few meters to the surface. He made an active decision not to bailout thinking he would be ok to ascend that short distance. Sam lost consciousness from hypoxia just below the surface and was pulled from the water by his dive buddies. He suffered no ill effects from his very close call. On inspection of

his equipment afterwards his oxygen QC6 had separated.

Conclusion:

The Swagelok QC6 has become extremely popular for technical diving applications. It is very robust, easy to connect under pressure and entrains only very small amounts of water when connected underwater. It has great flow characteristics when high flow is required at significant depths. I have listed the three most serious of many similar incidents I have witnessed or experienced due to QC6 disconnections. I believe there can be two causes. Firstly, a knock to the QD in just the correct spot can make the connection jump apart. This is easy to demonstrate yourself. Secondly, it is possible to connect the QC6's, establish flow, and then find that the connection was not "locked" and the connectors subsequently separate. As a team we have developed the "tug test" to ensure the connect is secure. The call of "tug test!" is a common cry at the water just before descent.














It may be time to return to other products on the market that have a locking function, however my experience with the most popular of these is not perfect either. Whatever you use, check and double check, and don't put all your gas supply "eggs" in one basket. And remember, all three of these divers are in my view, highly experienced, careful and competent guys. You never quite know how you will respond when you only have seconds to find a solution!

**IN THE NEXT ISSUE
OF GUIDELINES**

**The full story on
the CDAA's new Mala
GX80 HDR Ground
Penetrating Radar.**



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PARTING SHOT



Divers descend from 28 to 56 metres inside a ventilation shaft in Ojamo Mine. Ojamo Mine story is on pages 16 to 26 of this issue. Photo by Janne Suhonen