



Author / speaker Rod McDonald launched his latest book about the Force Z wrecks at OZTek.2013 (lower left). John Garvin presented a "behind the curtains" story of James Cameron's successful "Deepsea Challenger" project ([www.deepseachallenge.com](http://www.deepseachallenge.com)). The filmmaker / explorer reached a depth of 10.9 km down in the Marianas Trench.(top right); A view of the 2013 OZTek Exhibition (lower right); (lower right)

# Tales of 'Daring Do'

— *And a Sobering Lesson from OZTek 2013*

Text by Rosemary E Lunn  
Photos by Paul Morrall



Although Facebook is a useful tool, it can never replace physical interaction with friends, colleagues and peers. Without a doubt there is a need for a regular gathering of the clans. Events like EUROTEK and OZTek serve a vital role drawing people in from all over the globe, bringing together briefly a good part of the technical diving village, and reinforcing the strong sense of community we share. We meet to discuss information, tell stories, share ideas, celebrate success, learn and laugh from our collective mistakes, and mingle with the top explorers, pioneers and exhibitors in our field.

Michael Menduno made a valid point when he suggested "these conferences may even be more important today when a preponderance of misinformation, in many cases perpetuated by self-proclaimed Internet experts (the online equivalent of TV's talking heads), seems to reign supreme."

OZTek.2013 dive conference and exhibition certainly successfully played its part by delivering accurate, relevant, educational and entertaining content. Over the course of two days (Saturday 16 and Sunday 17 March)

over 50 talks were held at Sydney's Australian Technology Park, with delegates sorely tempted by four halls of concurrent talks—talks that covered so many aspects of diving, from technique, such as *Stick maps to virtual cave diving: Instruments and techniques for constructing maps, 3D images and even virtual cave models* by John Dalla-Zuanna, to exploration, such as *Bermuda's Deep Water Caves* in which Professor Tom Iliffe talked about how this project is employing sonar, ROV's and CCR divers to explore and document the island's extensive network of underwater passageways.

Safety was reviewed, as in *CCR Bailout: How much?* in which Ben Reymenants took a fresh look at every CCR diver's worst scenario. Is the current thinking of bailout gas volumes realistic, conservative or otherwise?

To getting au fait with the latest technology, as in *Mastering the Light* in which Kevin Deacon discussed a new genre—images shot using black light equipment.

With some amusing anecdotes along the way: *Carry on diving: The lighter side of diving*, with Martin Robson's entertaining view of the minor hiccups and diplomatic incidents that can only happen on a dive trip.

## Dive safety and rescue

For once I got to sit and enjoy some of the talks. (When you are organising an event, you rarely get to enjoy this privilege). The talk at the very top of



my personal wish list was *Rescue of an unconscious diver from depth: The new UHMS Diving Committee guidelines, their findings, and the arguments supporting them*, delivered by Associate Professor Simon J Mitchell.

The UHMS—Undersea and Hyperbaric Medical Society at [www.uhms.org](http://www.uhms.org)—is an incredible source of information for diving and hyperbaric medicine physiology worldwide. Approximately three years ago, a number of members of the UHMS Diving Committee (Simon Mitchell,

Mike Bennett, Nick Bird, David Doolette, Gene Hobbs, Ed Kay, Tom Neuman, Richard Vann, Richard Walker and Alan Wyatt) came together to discuss questions posed by the AAUS (American Academy of Underwater Science) and PADI. (PADI was revising its Rescue Diver manual at this point.)

There had also been much discussion by armchair forum divers on 'the question'. The great question posed—and no, it was not "what is the meaning of life, the universe and everything?"—was





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"what are the recommendations for rescuing a submerged unresponsive compressed gas diver?"

The team started looking into this and found that it was hard to find anything written in diving literature on rescuing an unconscious diver. A project was set up to develop definite guidelines, and three years later a paper was published.

Simon Mitchell's presentation (and the paper) covered a number of questions:

- If the regulator is out of the mouth, should it be replaced?
- If the diver is in the tonic (rigid) or clonic (grand mal) phase of a seizure, should the ascent be delayed until the clonic phase has passed?
- Are there any special considerations for rescuing CCR divers?
- What is a 'safe' ascent rate?
- If the rescuer has a decompression obligation, should they take the victim to the surface?
- If the regulator is in the mouth and the victim is breathing and has decompression obligations,

does this change the ascent?

- Is it necessary to hold the victim's head in a particular position?
- Is it necessary to press on the victim's chest to ensure exhalation?
- Once you reach the surface, is it possible to assess breathing in the water?
- Can effective rescue breaths be delivered in the water?
- What is the likelihood of persis-



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tent circulation after respiratory arrest?

- Does the recent advocacy for 'compression-only resuscitation' suggest that in-water rescue breaths should not be administered to a non-breathing diver?
- What (if any) rules should guide the relative priority of in-water rescue breaths over accessing surface support where definitive CPR can be started?

Normally we (every day recreational and technical divers) would not get access to this paper for a few years, until it was made available to the Rubicon Foundation ([www.rubicon-foundation.org](http://www.rubicon-foundation.org)). However, the UHMS has kindly given The Dive Forum ([www.thediveforum.com](http://www.thediveforum.com)) permission to upload the paper on their forum.

It should only be printed once you have downloaded it. This is because the UHMS wants to track the downloads of this paper, so please send everyone to this link: <http://www.thediveforum.com/incidents-safety-information/1329-uhms-39-paper-unconscious-diver-recovery.html> (You will need to register on The Dive Forum before you can download the paper.)

Once you have downloaded the paper, you will find a very use-

ful flow diagram on page eight. It is a summary of the important recommendations and decision-making processes in the rescue of an unresponsive diver from depth. The authors have stated this chart should be considered along with the relevant comments made in the related sections of the paper.

This flow diagram was created so that it could be printed out and pinned to every diving club or dive centre notice board, laminated and put in with their first aid and oxygen kits, and included in every emergency action plan. It is an exceptionally useful rescue resource for all divers.

### Safe exploration

Another presentation came from another diving doctor—this time Dr Richard 'Harry' Harris. Having briefly observed Dr Harry in action at Rebreather Forum 3, I was curious see more. Harry Harris teamed up with fellow Wet Mule team member Craig Challen for a talk on extreme exploration entitled, *Beyond 200 metres*. The Wet Mules discussed the factors limiting safe exploration at these depths based on their experiences diving New Zealand's Pearse Resurgence.

The Pearse River Resurgence is located at the northern end of

Simon Mitchell's talks are always incredibly popular



# DIVE INTO THE POSSIBILITIES.

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New Zealand's South Island, near Mount Arthur. It is Australasia's deepest underwater cave with 'summer' water temperatures of less than 7°C. Exploration has been going on here for a number of years, with various teams of experienced cave divers coming together to progress the cave at regular intervals. Back in 2007, a major leap forward was achieved by David Apperley and Rick Stanton MBE.

Over the years, expeditions had repeatedly pushed this cave system, and in 2011 during a nine hour dive, Craig Challen set a

Another view over the OZTek exhibition

new record depth of 194 metres, with the cave continuing to 'go'. A year later, the Wet Mules team again comprising David Bardi, Craig Challen, John Dalla-Zuanna, Richard 'Harry' Harris, Ken Smith and Sandy Varin returned, armed with two objectives. They wanted to see if Pearse was connected with nearby Nettlebed Cave. With the assistance of Nelson's Speleological Group, dye tracing from the Spillway in Nettlebed confirmed a deep connection at >120 metres.

Jayne Jenkins, OWUSS Rolex Australasian Vice President, received an OZTek Industry Recognition Award



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Scuba Industry stalwart (and previous OZTek award winner) Terry Cummins, presented explorer Jill Heinerth with the OZTek Media Award for her sustained work on 'We Are Water'



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Attention then focused on pushing the cave once again. Four habitats were installed at 7, 16, 28 and 38 metres, gas was staged and build up dives commen-



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Richard Taylor received an OZTek Industry Recognition Award from AUP's Tony Davis

ced. Dave Bardi and Sandy Varin dived to 180 metres followed by seven hours in-water deco.

The next day, Harry Harris tied off to the end of Craig Challen's 2011 line in 194 metres, and proceeded to lay a further 70 metres of line in large passageway, tying off at 207 metres. He had a total run time of 10.5 hours in-water, in reasonable comfort, thanks to the habitats and surface supplied suit-heating systems.

Weather stopped play, with the final push dive being done by

Craig Challen two days later. He tied off to the end of Harry Harris' line and scooted on a short distance

only to discover another steep descent. Craig Challen made the final tie off at 221 metres and returned to the surface. His total runtime was 17 hours.

The passage way continues to go, and the technology is capable of going deeper. The obstacle to on-going exploration is human physiological limits.

Two short videos were played of the lines being tied off at depth—one of Harry Harris' dive, the other was Craig Challen's. What struck me was the soundtrack of the video, because of the grunting and coughing. These noises may not sound much to you, but it indicated a real and significant threat to both divers.

We are right on the edge of

Whilst the technology still functions, the body does not. Extreme pressure causes respiratory complications—in a nutshell, the gas is so dense that the body perceives it as an issue when breathing, and therefore starts coughing to deal with the problem. It can tragically lead to an inability to match ventilation with the demands of physical work at great depth - see reference 1 in footnote.

I sat there drinking in the tantalising crystal clear deep-water footage Craig Challen and Harry Harris had shot, showing a cave continuing to go, with my heart noticeably thudding. I have nothing but admiration for the Wet Mules; they quietly get on with remote exploration. To push the cave depth by another 27 metres is a significant achievement at these depths. However, I personally hope that this extreme project is put on hold until technology is able to catch up and support the body far more effectively and efficiently.

REF. 1): MITCHELL SJ, CRONJE FJ, MEINTJES WAJ, BRITZ HC. FATAL RESPIRATORY FAILURE DURING A 'TECHNICAL' REBREATHING DIVE AT EXTREME PRESSURE. AVIATION, SPACE AND ENVIRONMENTAL MEDICINE 2007; VOLUME NUMBER (78) 2



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Gala hosts Michael Menduno and David Strike

## Daring do

Time for OZTek speaker Paul Haynes to enter stage left. His delicious rip roaring yarn of 'daring do' had me giggling in my seat. It was entitled, *Operation Reclaim: The gripping story of the race by a combined British civilian and military expedition to recover the ship's bell from HMS Prince of Wales.*



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Simon Mitchell presented Pete Mesley with the OZTek Outstanding Achievement Award for "exceptional contributions to the growth and development of technical diving"

Very briefly in the early 2000s, during a British expedition to the Force Z wrecks, diver Gavin Haywood chanced upon *HMS Prince of Wales* ship's bell. It was protruding from the sand beneath the starboard gunwale at the forward end of the wreck. Haywood was instantly faced with a moral dilemma. He knew he was diving a protected site—'look, no

touch'. However, the bell was in a visible place, and the wreck would inevitably be visited by divers who do not always respect British laws. What to do?

Haywood left the bell on the seabed, surfaced and rang the Receiver of Wreck, the U.K. Government Agency that overseas U.K. shipwrecks by satellite phone. Their reaction? The bell should remain with the ship.

Then the word went around that good money could be made for recovering the bell. A non-British private collector wanted it in his board room. The Ministry of Defense realised that this historical bell was in imminent danger of being claimed as 'a trophy'.

An urgent case for salvage was made by Lord Clifford, the Chair of the Force Z Survivors Association, who requested full U.K. Government support should be given to a U.K. civilian dive team preparing to recover and return the bell to the Royal Navy. This support turned into a full-scale military operation, following an initial conversation with the U.K.

civilian dive team, that included Paul Haynes.

Haynes' story could have been taken straight out of any *Boys Own Manual*. It had everything in it. The danger, the toys, the failure, the boys, and the ticking clock. In cinematic terms think *Where Eagles Dare* meets Michael Caine's *Italian Job* featuring James Bond 007. I was enraptured. If you ever get the chance to listen to Haynes regale this story in the future, grab it for the sheer irreverent giggle factor of hearing how the bell came home in time for tea and medals.



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Pioneering shark expert, photographer and cinematographer, Valerie Taylor received a standing ovation when she was given the OZTek Lifetime Achievement Award by Jayne Jenkins

## Happiness to heartbreak

For me, one of the most significant moments of the conference was a rebreather accident analysis session. Billed as *Oxygen cell*





Brian Kakuk waxing lyrical about scientifically significant underwater Bahamian caves.

*failure in rebreathers: Critical safety lessons from relevant cases, this was a very rare and exceptional presentation and a key teaching moment for the 200 odd delegates crammed into the room. Thanks to the kind permission of the coroners, police and the families, two recent rebreather deaths were broadly analysed to help prevent future deaths.*

The packed, standing-room-only audience listened to Drs Mitchell and Fock, as they lead a discussion on the fatalities, with supporting comments from rEvo CEO Paul Raymaekers. Data from both final dives was available because of the on-board Ambient Pressure Diving recorder, or black box.

It should be noted that the official cause of both deaths was not known at the time of this presentation, though a potential contributing fac-



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tor in both fatalities appears to be a double O<sub>2</sub> sensor failure. Most rebreathers use three sensors and a voting logic algorithm. Both divers had sensors more than two years old in their units.

The session began with a very strong statement from Fock requesting that attendees do not post he-said/she-said facilitator opinions, as the coroner had not yet ruled on at least one incident, adding that there was "already too much misinformation online". Fock then dived into a presentation of the circumstances of both accidents.

The handset data of both dives was shown and evaluated, and the hushed audience was able to observe the PP02 readouts for all three cells throughout the dive. It was also noted that the divers had suppressed alarms given by the unit.

The doctors then asked the audience to consider what decision they personally would have made if they had seen the same data on a dive, and take time to step back and reflect on this. Fock and Mitchell neutrally observed that these divers believed at the time, that they were making reasonable and rational decisions both pre- and during the dives, even though they would probably agree that these decisions do not stand up well in the harsh cold

It seemed fitting that Liam Allen received the OZTek Technical Diver of the Year Award from the EUROTEK Technical Diver of the Year, Richard Lundgren

light of day.

All too often we as divers discount such analysis when we are safely seated in our warm armchairs, because we feel that we would not make the same decisions. Yet, here are two divers, in quick succession, who have done exactly the same thing.

It was a sobering session, and we left the room older, wiser divers appreciating that data from accidents is not typically forthcoming, or even made available to the general diving community, because of litigious factors. Both cases and conclusions are currently being written up for publication, after the coroner's determination is released.

So what was the take home message from this talk? Be prepared to recognise, diagnose and deal with double sensor failures, because they WILL OCCUR with existing sensor technology.

The manufacturers present at this talk (APD, VR, Innerspace Systems, rEvo) recommended not using sensors older than 18 months because they are prone to failure. One advocated way of dealing with sensor replacement, which was promulgated at the session, is to replace your sensors one at a time in six-month intervals (to maximize the probability of independence between sensors).

My personal suggestion? We are all busy people with many good intentions. Give your rebreather manufacturer your credit card details, and ask

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It was a bittersweet conference. Event organiser David Strike announced that he was retiring and this would be his last OZTek

them to automatically dispatch a new cell to you every six months.

As an aside, last year an international safety meeting was held about rebreathers called Rebreather Forum 3. A number of the presentations are now available online for free for you to download. Follow this link—[www.rf30.org/presentation](http://www.rf30.org/presentation)—and you will find a talk by Dr Arne Sieber on *O<sub>2</sub> Sensor Technology for Rebreathers*, Kevin Gurr on *Knowing Your Limits: CO<sub>2</sub> Sensors*, and Nigel Jones on *Redundant Oxygen Sensors: Theory and Heresy*. Click on 'Video Link' and you will hear the talk illustrated by supporting slides. In addition, there is also a PDF download available for both Arne's and Kevin's talks. Please pass this website onto anyone you know who is interested in or dives a rebreather.

## Highlights

There are times when I wish I could be cloned. During the run up to EUROTEK would be a good time to

have 'extra Roz hands'. At OZTek my clone could have sat in on other presentations I wanted to watch. It didn't help the suffering much either when I caught up with delegates who had seen my second choice talks, because they raved about what a riveting presentation I had missed. As is always the case, I didn't get to hear everything, but I was certainly spoilt for choice thanks to OZTEK organiser David Strike.

So I had been educated, inspired, and seen all the latest new toys in the exhibition. The only thing left was to celebrate success at the OZTek Gala Awards Dinner. This is held on Sunday night, at the conclusion of the conference at a wow of a venue in Cockle Bay Wharf. (Unfortunately, there is no way that Broad Street on a wet Sunday night in Birmingham could ever compete with Darling Harbour.) We enjoyed the view over pre-dinner drinks in the balmy dusk, whilst catching up with friends.

It was clear to everyone present that David Strike and Michael Menduno gleefully enjoyed being the joint

The OZTek.2013 Speakers and MC's



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Master of Ceremonies for the OZTek 2013 Awards. The evening was a very happy one, with much playful banter and laughter from the audience and those present on the stage.

The OZTek Award Winners were Liam Allen (Diver of the Conference), Jill Heinerth (Media Award), Jayne Jenkins (Industry Recognition Award), Pete Mesley (Industry Recognition Award), Liz Rogers (Image Award), Richard Taylor (Industry Recognition Award) and Valerie Taylor (Lifetime Achievement Award).

There was however a bittersweet moment, because it was the night that Strike announced his retirement from organising OZTek. Whilst most people can take a good guess at just how much work goes into making the magic happen, they never really see the whole of the trick. To consistently pull off a successful conference through these harsh economic times certainly does take experienced wizardry. No wonder Menduno presented Strike 'The Wizard of OZTek' Award.

I sincerely look forward to seeing OZTek continue to flourish in the future, whilst wishing David and Sylvia Strike a very happy retirement, and many thanks for all they have done to serve the recreational and technical diving industry. ■

*The author acknowledges and wishes to thank Graeme Gourlay and Michael Menduno for their assistance with this article.*



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