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 Little 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 get 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—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 Doolittle, Gene Hobbs, Ed Kay, Tom Neuman, Richard Yann, 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...
Paul Haynes discussing 'Project Reclaim'.

“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 in 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?
• What is the likelihood of persistent 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). However, the UHMS has kindly given The Dive Forum (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.htm (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 useful 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.

The 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 or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board, laminated and put in with their first aid or dive centre notice board

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 to 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 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 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-Zaanna, 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.

Simon Mitchell’s talks are always incredibly popular.
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 commenced.

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 lie 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 human physiology when we technical dive to these kinds of depths. (220 metres = 23 bar of pressure).

Whilst the technology still functions, the body does not. Extreme pressure causes respiratory complications—inhaling so much nitrogen 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.

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”.

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 with a deck scene. Billed as a rebreather accident analysis session. Billed as a rebreather accident analysis session.

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 inerrent giggle factor of hearing how the bell came home in time for tea and medals.

Happyness to heartbeat For me, one of the most significant moments of the conference was a rebreather accident analysis session. Billed as Oxygen cell
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 factor in both fatalities appears to be a double O₂ 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 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...
It was a bittersweet conference.
Event organiser David Strike announced that he was retiring and this would be his last OZTek. 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.