

The Muddy Puddle

VOLUME 2, ISSUE 4

JULY 2000

It's all getting a bit Technical

This month I've tried to give the magazine a bit of a theme. Technical Diving.

There is a introduction to technical diving which includes a description of the Devil Gas, Nitrox.

With greater numbers of Divers taking a mixed gas approach to diving I thought it would be nice to cater for them, and have been given a article from a club member regarding how to set out a decompression station, for those long cold hangs you don't get told about in training. Given the number of applications for Diver of the Month I doubt many club members should be allowed to enter into decompression diving, let alone deeper into the technical aspects of the sport.

However Diver of the Month, was won by a non diving, non-foolish act(?), but has been given in recognition of a major change.

Once again we have no official word from our Chairman, some say he has lost the power of communication but I say, nah hold your touge. He's just building for something big to say. The D.O. Seems to have taken the same route as the Chairman, but didn't he do well last month.

On the subject of last month, I must apologise for all those reader who receive

there copy by snail mail, (non electronically, (by post)). Due to a printing problem the magazine was not posted out. That is why you received last months with this months. If anyone wants to complain, well I dare you too, you'll only end up having to publish the mag next year.

Finally I have it on good authority that Narced will return. Happy Bubbles.

Pool Times

During the Summer and at all times unless otherwise notified St. Joseph's Pool will be open for training as per normal on Wednesday evenings. Tuesday evenings are **not** available until the new school term.

Here comes the Clowns....

After recent incidents, would all divers please remember to ensure that all the diving equipment required for diving is brought to the dive sites. It is the divers responsibility to ensure that they have the correct kit, no one else's. If you require club equipment, inform the Equipments Officer in good time, and pick the kit up from the club the Wednesday before the dive.

It is also the d-

ivers responsibility to ensure that they have enough air to complete the dive (or to attempt the dive). Bottles should be checked and filled before the day of the dive, not at the dive site.

Although it makes good reading in Diver of the month, it will ruin your day's diving.

Please also remember to take all you kit home with you.

INSIDE THIS ISSUE:

Tekkie....	1
Lizzy Bird Speaks	2
D.O.M	3
Deco Station	4
Crab Pasties	5
Six in the Scillies	5
Dry activites	7
Intro to Tekkie Land	8
Diver of the Year	12

DIVES COMING SOON

Saturday 12th August

Littlehampton
8:30am
Paul Brown (SD+)

Sunday 20th August

Littlehampton
7:30am
Tom Maguire (CL+)

26-28th August

Falmouth
Under Pressure (SD+)

Sunday 3rd Sept

Littlehampton
8:30am
Dave Enderson (SD+)

CL = Club Diver

SD = Sports Diver

DL = Dive Leader

Letter to all Diving Officers and Branch Officers

Wreck Diving

For some time there has been a small but growing public concern at the apparent vandalism by sport divers of military wrecks; these are often referred to as war graves, but include all military wrecks where life was lost, whether in war or peacetime. This concern has been greatly developed over the last year. Following some well-publicised incidents in which the media showed interest, the activity by certain pressure groups seeking to stop sport divers from diving on military wrecks intensified just before Christmas 1999. Since then we have been in constant discussion with many different groups of people in an effort to raise the profile of the responsible recreational diver who enjoys diving wrecks. We have joined with PADI and SAA in an initiative called 'Respect our Wrecks' aimed at ensuring that all divers act within the law; and with sensitivity towards war graves. We have been working hard in your interests, and it is time now to ask for your help as Diving Officers and Branch Officers in ensuring our freedom to dive wrecks continues for many years to come.

All divers in British waters are facing a very real threat to their freedom to dive military wrecks. There are some pressure groups who are lobbying Parliament very successfully to make diving military wrecks illegal. Questions have been asked in Parliament, and some MPs are arguing that a ban on all diving on war graves should be brought in immediately. These pressure groups are effective because they are totally committed to what they are doing.

At the moment only military aircraft have been protected under the Protection of Military Remains Act 1986. These cannot be dived, or excavated on land, without a licence from the Ministry of Defence. If shipwrecks are designated under the 1986 Act then the situation will be more serious. We have good reason to believe that where shipwrecks are concerned they will be designated at 'control level'. This will make it illegal to dive these wrecks at all. We believe that as many as 11,000 wrecks would be designated at control level. We also believe that it would be difficult for groups to get permission to dive these wrecks for any purpose.

The designation of these wrecks can be completed within days by statutory instrument, and diving them will then be illegal.

There are people who believe that such a ban could not possibly be policed. This view is not accurate. If designation of shipwrecks proceeds then the MOD will ensure that resources will be made available to detect and prosecute offenders, and anyone found guilty will have all the problems of a criminal record to deal with.

We are facing a very serious threat to our freedom. We need you and your members to do three things now:

* Stop taking any material from military wrecks, and their

debris fields.

* Act within the law by reporting all the material lifted from non-military wreck to the Receiver of Wreck as soon as possible after the dive.

* Ensure that everyone in our branches understands the implications of the current situation and knows how they can help to ensure that we can continue our free access to wrecks.

The best course of action is to stop taking wreck material full stop. If you have undeclared material in the branch, or at home, then contact the Receiver of Wreck, who will advise you of your next steps. The current Receiver of Wreck is very approachable, and sympathetic to divers and will give you good advice. The Receiver of Wreck can be contacted at:

The Marine and Coastguard Agency
Bay 1/05.
Spring Place,
105, Commercial Road,
Southampton
SO15 1EG
Tel:023 80329474.

The Receiver of Wreck also has some useful leaflets that will explain the law in more detail. Alternatively you can contact BSAC and we will obtain expert advice for you.

We cannot emphasise too strongly that we need to regulate our own diving behaviour now before others are forced to impose regulation on us. You, the Diving Officers and Branch Officers have a vitally important role to play by actively discouraging the wreckers in your branch, and by ensuring that everyone acts within the law. We know that there will always be those who will not listen, and those are the individuals who have got divers such a poor reputation in the public eye in the first place. It is possible that the actions of an unthinking or uncaring few mean that the rest of us cannot dive our favourite wreck sites.

Please bring this letter to the attention of your members, and post it on your branch notice boards to ensure that everyone understands the gravity of the situation and the need to act responsibly. We need your help in ensuring that the joint initiative undertaken by BSAC, PADI and the SAA, and the huge amount of work that has gone on behind the scenes has the outcome that we all want: the freedom to dive wrecks responsibly.

Any queries about this information should be directed to Jane Maddocks via BSAC Headquarters or by email to jane.maddocks@bsac.com.

Phil Harrison **Lizzie Bird**
BSAC Chairman **National Diving Officer**

Diver(s) of the Month

After the recent performances by club members for the diver of the Month award I was beginning to despair of any one winning the award again. But then we have had a bumper month this month.

It all began with Mr. Elpick and Mr. Bodington in the Scillies. After being late for the first days diving and missing slack. These two gentlemen kitted up early for the second day. So early in fact that both were sitting full kitted, breathing from their regs 40 minutes before reaching the dive site. They then bumbled there was into the water not first but as the third pair in. Anyone who knows the dive ritual of these two gentlemen are, I'm sure, aghast with their ability to kit up at any other time, other than 10 minutes after slack. However, they did not win, I can't give it to myself.

Mr. Eddie Driver and Mr. Ed Wilkins, also on the Scillies trip managed to lose each other at 30 minutes and surfaced 7 minutes apart from each other, bad, very bad. But how did they lose each other? Well, Mr. Driver happened to mention that he was following Mr. Driver along on a wreck, when a large torpedo shaped object shot past his head and dived into the wreck, then the reg to his pony bottle tried to follow. Have you guess what the torpedo shaped object is yet? Yes, Mr. Driver had not connected his pony bottle to his tank yet.

Apart from these two minor points the Scillies was very disappointing from a DoM point of view. However, on ordinary Saturday day's diving has brought several other people into the running. The first our present most capped Diver of the Month, Joanne, attempted to gain the award again, but I have discounted her entries for this month as I'm sure it is an attention grabbing thing.

On this day in question, a few of the less experienced members of the club were being shown how not to behave from some of the "Should Know Better" Brigade. To quote one Dive Leader "I returned to the shot, could see through all the silt, as there were six divers there. So I just grabbed a buddy, anybody and went up!" Mmmh!h!

One this day, the Great Gloved One (Paul Carvall), step forward to show us all how to dive. One the second dive of the day he and his buddy, Joanne, descended to the bottom, a depth of 9m, which soon rose to 6m. After 25 minutes at 6m, Paul decided it was time to go up. Like the "Good Boy" that he is, he thought about a decompression stop.

Ah, now he was in trouble, Paul usually stops at 9m and at 6m, but he had just dive to a maximum of 9m, but spent most of his time at 6m. What a dilemma, he thought, the solution came to him; stop a 3m for a minute or two. For those that don't believe it, I believe there is a Dive sheet to confirm this. But Paul doesn't win either.

One this same day, another Dive Leader decided to show his prowess. This twin laden "Adonis", showed his metal, deciding this would be a good opportunity to impress the younger members. However, I do not believe all when according to plan. For the weather was not kind, and between the Technical Talking and strutting like a South American Dictator, this Diver was throwing up for England. Then after kitting up and claiming to be ready, it was pointed out that his dry-suit inflator wasn't connected, then it was pointed out he wasn't wearing a weight belt. Oh dear time to de-kit again. It was said that Mr. Gary Eason blushed, blushed??? And looked very ashamed of himself. No never.... But even this doesn't win.

Years of pressure from the League Against Cruelty to Animals have finally paid off, and we have a right and just winner of Diver of the Month. He was a late entry, with a unique approach, not diving related as such, but does have its advantages in an underwater environment. It is with great pleasure that I can announce that the Stoat on the back of Dave Elpick's has been freed (or it's died and dropped off Dave's not saying). No more will we hear that familiar cry from Dave "Has anyone seen my hairnet hair band", no more will you have to try to sort out his dry-suit's neck seal against that mass of tangled roots, no more will Dave look like a Cone-Head underwater. Yes, the rat is dead, long live the basin job. Dave's excuse is that he's getting into technical diving, and it's a Tekkie haircut, but we know the truth. Well done Maz. Dave is our diver of the month for the complete image change, don't get me wrong this is a good thing, and in recognition of this, this is he's reward, and for once not for being stupid or foolish. Well done Dave, on this brave new step, I hope this means we can get in the water sooner in future, but I somehow doubt it.

Decompression Techniques for Deeper Diving

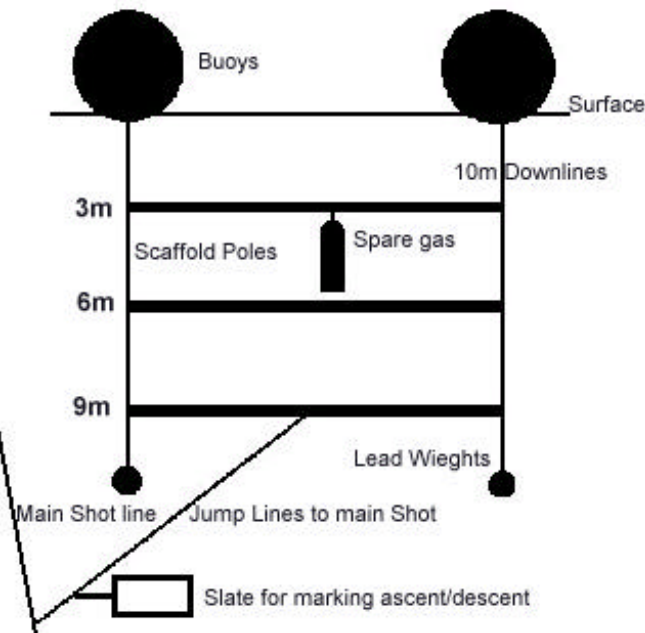
The major problem with deeper diving is the decompression penalty incurred through spending time at depth. Clearly when diving to 40 or 50m staying within the no-decompression limits is pointless – anyone fancy a 3 hour ride out to a wreck to spend 5 minutes on the bottom? No Thanks...

When making our stops there are several techniques that can be employed to make us more comfortable. Crowded shot lines and hanging on to lines like flags in the wind are not the best ways to carry out our stops – it is uncomfortable, stressful and it does little to aid the decompression process. For our deco to work ideally we want to be able to hold our stops at the required depth (not a meter either side) without having to either hold ourselves down or fin like mad to keep ourselves buoyant. So perhaps the first point to make is that if you are talking about doing decompression diving then your buoyancy should be spot on.

If we are using only the shot line to deco on it is going to get very crowded with 12 divers all wanting to be at 6m for 20+ minutes. A simple solution to this problem is the Jon Line, this is exactly the same as a buddy line but tekies like to be different.. The Jon line has a caribiner at each end – one end clips on to the shot line at the required depth, the other clips on to the diver. As the line is played out (about 3m of line is usually sufficient) the dives are kept at the required depth, away from the shot and away from other divers. A second advantage to this system is that in rough seas the Jon Line will take some of the shock out of the shot and save the divers bouncing between 3, 6 and 9m. By organising a system whereby buddy pairs have different length lines several pairs can deco at the same depth without getting in each others way.

A favoured technique to using the shot line is the use of a deco station or trapeze. As shown below:

The station is set up by the first pair of divers at the start of clip at each end – and one to the 9m the shotline, at the to the shot there is a names and 2 boxes the descent (so we scended) and a sec-cent. The final pair list on this slate and descended now have have ascended (and This allows the final that the station floats can carry out their scaffolding bars as a low extra cylinders at the appropriate drinks and reading planning to stay there a while). Extra clip on weights can be left here so more air can be put into the suit to keep warm, the bars are useful for dropping off any awkward bits of gear or bags of goodies. If the final pair does not make it back to the station the jump line may be unclipped from the 9m bar after some agreed time (eg 10 minutes after they were expected). If the pair do make it back to the shot but the station has gone then they can either carry on up the shot line or can put up a delayed SMB – this must be agreed with the skipper prior to the dive.



is set up by the first pair of the dive. The jump line has a one clipped to the shotline bar. Descents are made down end of the jumpline attached slate with a list of divers for each. One box is ticked on know which pairs have de-ond tick is made on the as- of ascending divers will see a know that all those who have the second mark to say they are therefore on the station). pair to unclip the jump line so along with the current. Divers deco in comfort using the visual reference. The bars al- of deco gas or air to be staged depths and goody bags of material to be left (if your

The use of both the Jon Line and the deco station are becoming standard practice among deep divers as they provide a safe comfortable way to carry out decompression. We will soon have a station made up that will be used on the deeper diver we are making this year – hopefully everyone will appreciate the comfort it provides and there will be no more gripping on to the shotline for dear life.

Diver of the Year.... (The Real One)

This years REAL Diver of the Year Award is going to be run slightly different to that of previous years.

The D.O has request that club members nominate divers for the award. Then at the end of the year he will assess each nomination and award as appropriate.

Nominees do not need to be the great and the good, but a diver who has impressed others with their actions, temperament and attitude throughout the year. This could be a novice diver who has excelled during their training, or had to overcome great difficulties and finally won through.

Alternatively this could be a diver who has grown in stature over the season, or someone you respect and admire (as a diver).

You will be asked to validate your reasons for nominating the individual. All nominators will be forwarded into a raffle.

Use the form on page 10 and hand it to the Dry-Member or D.O before the end of the season.

Crab, Leek and Saffron Pasties.

2lbs (900g) Chilled Fresh Puff Pastry

¼ teaspoon Saffron strands

2 teaspoons hot water

12 oz (350 g) white Crab meat

3 oz (75g) brown Crab meat

8 oz (225g) thinly sliced Leeks

2 oz (50g) fresh white Breadcrumbs

1 teaspoon salt

White Pepper (10 twists of the mill)

1 oz (25 g) Butter (melted)

Pre-heat the oven to 200C/400f/Gas 6.

Divide the Pastry into 6 pieces. Roll out each piece on a lightly floured surface and cut into a 7 ½ inch (19cm) circle.

For the filling, soak the Saffron in the hot water for 5 minutes. Put the white and brown Crab-meat, Leeks, Breadcrumbs, Salt and Pepper into a bowl and stir together until well mixed. Crush the Saffron a little into the water to release the colour and flavour, then stir in into the melted butter. Now stir this into the rest of the filling ingredients.

Divide the filling mixture between the pastry circles. Brush the edge of one half with a little water. Bring both sides together over the top of the filling and pinch together well to seal. Crimp the edge of each pasty decoratively between your fingers. Transfer to a lightly greased baking sheet and bake for 35 minutes, until golden brown.

Serve Hot or Cold.

The Silly Six go mad in the Scillies

It was the last day of June the weather was typical for the summer of 2000, drab and overcast around the South East of England as the Scilly Six set off. But as we travelled westward towards Dartmouth the weather improved until we were met by brilliant sunshine. That Last Friday of June, the intrepid adventurers met in a pub in Dartmouth, the six from Croydon BSAC, met with Ian, Pete, Ray and Glen from Mid-Herts BSAC, Keith an PADI Diver from Tonbridge and Frank, a wreckie, from California. Here too most of us met the crew of the MV Maureen, the husband and wife team Mike and Penny, plus their son Giles.

Saturday morning came too soon for most as we left Dartmouth to the sound of a rumbling diesel and cranking of the anchor chain. Several members of our party looked and felt like a dog that had been kicked in the head, after the previous night's session. The first dive was on the Maine, a wreck between Devon and Cornish, in the 28-30-metre range. Most members of the expedition managed to keep their hearty breakfasts down. The viz wasn't great but better than is usually expected off Brighton, and was in the 5-8 metre range. The wreck was

much better than your average Littlehampton flattened plates and smashed boilers, with some of the superstructure remaining.

As per usual some things never change. Mr Boddington and Mr Elphick were the last to enter the water, due to Boddington Ear Syndrome, resulting in Compression stops on the decent. The other reason for their late entries was the phenomenon known as Elphicka, described by one of the worlds leading technical divers as "I have never seen any one, take so bloody long to kit up!" It seems that Mr Boddington has also contracted the disease from Mr Elphick, although not too the same extent.

The Tekkie twins, Mr Brown and Mr Emuss, lead the charge closely followed by Keith and Frank the Yank. Most entered the water on slack (with obvious exceptions) but during the dive the tide turned and began to run. The result was divers deco'ing whilst hanging on for dear life to the shot, with the exception of Paul Brown who lined off from the shot and got in Mark Emuss's slipstream using him as a buffer against the tide.

From here it was further down the English coast towards the Lizard, where the group did their

second dive. From there the MV Maureen travelled across to the Scillies. The crossing was not smooth as such; in fact comparisons were made with Red Sea boats, and roller coasters. The general consensus was that the boat could definitely do with stabilisers, or even better two hulls. Even when the sea was calm, the boat rolled through 80 degrees. When Cormorants dived for fish, the ripples created would send the boat rocking and rolling for hours afterwards.

Every night the boat would moor up in a quiet little fishing village somewhere on route, and after an excellent meal, cooked by Penny, the diving group would venture shoreward in a small inflatable and search out the nearest local. This would give the cabin's cockroaches time to scamper unhindered around the mess of sleeping bags and clothes below deck.

The bulk of the diving around the Scillies was Wreck Diving, with the general quality better than those regularly dived off the channel coastline. A large number of wrecks were coal-ships, plying their trade. Most amazingly nearly all of the wrecks were within a stones throw of the shoreline, with nearly every ship going down due to being run aground. This led to the same question being asked by nearly all the divers "How the hell did they not see the land?"

Most of the wrecks reached from 28metres down to almost 40metres. Such is the number of recorded shipwrecks in the Scillies that several sites had 2 or more ship's remains lying on top of one another.

Most wrecks were fairly well broken up, mainly due to storm damage over the years, some have become so embedded into the granite that it becomes difficult to work out where the wreck ends and the rocks start. But still enough remains to entertain the die-hard wreck divers, which inhabit British waters.

Few swimthrus remain and as on most wrecks in British waters, they are dominated by huge triple expansion boilers. These huge cylindrical units have retained their shape and presence after suffering all that the Atlantic storms have thrown at them for the past 70 years.

Kelp and Pollack dominated marine life on the wrecks, with some specimens well reaching into double figures in weight, and almost 3 foot long. Edible Crabs were few and far between, whilst large shoals of Bib (or Pouting) nestled amongst the wreckage. Flounder, Plaice and Dabs were found away from the wreckage on sandy ground between the rock canyons, and every where the ever present Wrasse patrolled, with smaller species hiding amongst the fringes of Kelp.

As can happen on a week's Wreck Diving Holiday, soon one wreck looks like another to the non-wreck devotee. Then mid-week, between dives Mike, lead us to a rocky headland, to meet the local inhabitants. Groups of camera shy Seals, slowly the group kited up, with Mr Elphick entering the water a good 30 minutes behind everyone else. For most on board this was their first time to swim, snorkel or dive with Seals, those who had the patience we're rewarded with fleeting visits from our mammalian cousins. The seals would often stick their heads out of the water, and watch the divers watching them, then disappear underwater towards the waiting diver. They would lie waiting for the approaching seal, only to find the seal is behind them, watching them, wait-

ing for the seal to appear. Once spotted the seal would swim off, slow and gracefully, trying to entice the watching human to follow. Those that tried were reminded who's environment they were in, as the seals gained speed, cartwheeling around, giving one last parting look as if to say catch me if you can, then dived off into the blue. More patient divers were reward with return visits from seals, possibly wondering why they weren't being followed.

The next day came the dive most on board had longed for, the Cita. The Cita was a freighter, which went down Christmas 1996 and remains fairly intact. Her back has been broken, but much of the superstructure remains. It is possible to swim into her bridge, and venture from there to the crews quarters by way of here internal corridors, and from there travel into the bowels of the ship, to storage rooms and into the huge engine room, without coming out into open water. However this should only be done by the most skilled and bravest of divers, as the command superstructure rests in over 40 metres of water, and the internal rooms and corridors are slightly silted. The depth also restricts the amount of natural light, and the internal areas can only be described as blacker than black, and without the aid of torches it would be impossible to penetrate.

The Cita lays on a sloping rock face 100 metres from shore. Her bows are in roughly 20 metres, with the cargo areas between 24 to 30 metres. The top of the Command superstructure is at roughly 32 metres and dropping to 45 metres.

The Maureen then left the Scillies for the trek back to the mainland, four more dives followed, with the final dive being on a wreck called the Oregon. Here the visibility improved greatly, with the aid of a white sandy bottom, to an impressive 15 metres. The wreck was full of life, ranging from Squat Lobsters up to impressive Conger Eels. The bow and stern were present, as were the boilers, the rest of the ship had been ravaged by time and storms.

On the journey back to Dartmouth, another oceanic traveller, a juvenile Basking Shark joined the Maureen, although this particular individual did not want to have he's picture taken. It was a fitting way to end the week.

The motley crew of Maureen gelled extremely well, had some good friendships formed. Promises of future join events were made between Mid-Hert's and Croydon BSAC, and Keith and Frank were told they were always welcome. One of these muted events was attendance of an underwater explosives course but Ian from Mid-Hert's and Chris from Croydon, (this has yet to be arranged). The last night was spent (as usual) in the bars of Dartmouth, without the worry of being too drunk to dive the next day.

Then final farewells were made, and all went their separate ways, thanking Mike, Penny and Giles, for an excellent week.

Croydon BSAC
are proud announce the
Christmas Party 2000

9th December 2000
Pitchers Sports Bar
Sutton

This is open to members and non-members
alike.

Tickets will be on sale from the 1st August

For more details see
Dave Elphick

To Bubble or Not to Bubble??

The Close Circuit Rebreather seems to be transforming diving, and to have gripped the diving press in a state of frenzied excitement.

But what is the truth and what is it really like? Now you can have a chance to find out

Mark Emuss is putting together a session on the Buddy Inspiration Close Circuit Rebreather. This will involve a talk by a Rebreather user and then a try dive with the unit.

Details are still to be arrange but if you would like to attend please contact Mark Emuss. Place are limited.

In a Rich Man's World

The committee has taken the decision to apply for a grant (or two) for funding for projects within the club. This is a complicated procedure and is required to be well thought out. To receive any funds we require a reason for the funding. Two suggestions which have been given and both will probably be used are:

- 1) A new engine or engines for the RiB.
- 2) 10 Complete sets of training kit, possibly including wetsuits for open water diving.

The Chairman and D.O are preparing the plan of attack at present and will report back at the next committee meeting in the second week of July. If you have any suggestions for raising money, or requirements for the club then please contact a committee member by the 13th August.

Committee 2001

We may be in the middle of the so-called British summer, and in the heart of the British Diving Season, but we, the committee, would like you to start thinking about next year.

After the end of the season the club AGM will be held. At which point the present committee will resign and a new committee will be voted in.

Any club member my apply for a post (especially editor), although some posts such as Diving Officer have qualification requirements.

Some of the present Committee will be reapplying for their posts whilst others will not.

If you wish to apply for a for a post please contact Dave Elphick for an application form, even if you wish to apply for Dave's post. He won't bite and likes a good bit of healthy

Club Fees :

Membership fees rose from the 1st June 2000, by £10. The cost of a renewal will be £145. This increase covers the £2 BSAC membership increase.

Please note this is the first increase in 5 years so don't whinge too much or too loudly.

Dry Activities

Calling all potential **Schumachers** and **Rambos**, the dry officer is looking into an evenings Go-Karting and possibly a days Paintballing. These events will go ahead if there is enough interest.

If you are interested in these or have suggestions for Dry Activities then contact :

Dave Elphick. on 020 8 688 5161

A BEGINNER'S GUIDE TO TECHNICAL DIVING.

by Mike Busuttil

You will have seen more and more references to "Technical Diving" on the pages of dive magazines over the past three years. When the term was first introduced its meaning was unclear and undefined and, in the U.K. in particular, there were many who declared that it brought nothing new, and that it had been with us for a long time under a different guise. If its meaning is a little clearer today, then it is because the said activity has evolved and matured during this time, and it has begun to take its place in the diving scene.

If we consider what we mean by "Sport Diving" or "Recreational Diving" then we can define it as the kind of diving that is contained within a broad sphere of activities that should be enjoyable, attainable, perhaps exciting and demanding, and surely safe. It has been the aim of the training organisations, such as the BSAC, to bring people to a reasonable level of competence in this activity, always bearing in mind that diving, when considered as a leisure activity, should not expose its participants to any unnecessary risk.

Now, the degree of risk is often in inverse proportion to the competence and experience of the diver. A further period of training should improve competence, and reduce risks.

It is when the type of diving being practised starts to present new problems that require new solutions, that new techniques come to be evolved. The steady progress of diving exploration is taking us beyond the more accessible inshore sites, toward less accessible sites requiring a broader range of techniques in order to maintain the required level of safety.

The training received by most divers has equipped them to undertake air diving to the limit allowed by their qualification, but in any case, not below 50m. For the vast majority of divers this is more than they should ever need. But it is, as always, the troublesome minority who have arrived at this limit and still find the need to go further who have caused the ripples that have resulted in the Technical Diving wave. This category of divers found the "amateur diver" description a poor fit as their needs led them to adopt techniques and equipment from the professional and military sectors, and then to evolve their own.

For many, the need arose from the pursuit of projects which slowly but surely took them outside the envelope of normal sport diving and into a new area of risk which needed a new set of solutions. This is the area which we also call "Extended Range Diving" since it recognises the basic needs of being able to go further, for longer, and in perhaps more extreme conditions. It is this "professional amateur", professional in approach, amateur in motivation, that forms the core of the Technical Diving community.

What does it involve?

Technical Diving uses a range of special techniques and equipment to extend the safe operational range and the possibilities of the diver. A principle feature is the use of gas mixtures other than plain air to reduce problems associated with nitrogen (decompression and narcosis). Initially this means breathing a Nitrox mixture which has an increased level of oxygen, and a lower level of nitrogen than normal air (21% oxygen/79%nitrogen).

A further refinement is to further reduce the nitrogen content by replacing all or part of it with another inert gas (usually helium) to reduce the narcotic effect of the mixture during deep dives. These mixtures can be breathed using conventional SCUBA equipment, specially adapted SCUBA equipment, or rebreathers, which recycle the mixture to make full use of the oxygen it contains and to give longer duration.

Technical diving also considers carefully the selection and suitability of all the diver's equipment for more adventurous or extreme diving. Special equipment and accessories have been developed with the aim of maintaining a high level of safety while diving under more difficult conditions. The Technical Diver leaves little to chance and aims always to be prepared for any predictable emergency, usually by carrying the solution with him. This is the direct opposite of the minimalist approach preached in warm water recreational diving and should be understood as having quite different objectives.

Techniques have been developed to ensure safe diving during penetration of wrecks, deep into underground cave systems and for diving under ice; a set of conditions grouped under the description "Overhead Environments". Diving into a situation where you cannot make a direct ascent to the surface presents a host of additional problems and gives new urgency to the problems of managing your gas supply. Once you go beyond the reach of natural light you have to rely on the illumination you can carry with you, and you have to concern yourself minutely with the question of navigating your way in, and more importantly out, of the cavity.

Other techniques have been evolved to allow extended in-water decompression procedures to be carried out in greater safety and with greater efficiency. Longer decompression procedures can underline the need for improved thermal insulation, beyond that required on normal dives.

The passage from normal sports diving to Technical Diving does not commit you to running the full gamut of the possibilities available. It allows you to acquire a few more tools and techniques to make the kind of diving you intend to do safer and more satisfying. The better understanding

gained may make your normal air diving safer and more interesting.

What are the advantages?

For most divers the passage into Technical country starts with nitrox. The advantage we are looking for from nitrox is longer no-stop times, or shorter decompression stops. By reducing the proportion of nitrogen in our breathing mixture we will absorb less nitrogen during the dive and have less nitrogen to eliminate during the ascent. For a given mixture we can calculate, or read from a table, the Equivalent Air Depth (EAD). This is the depth at which we would have the same PPN₂ if we were diving on air. Thus our no-stop limit at 30m using air and the BSAC'88 table A is 20 minutes, but if we use EANx36 we will have an EAD of 24m so we can extend it to 30 minutes.

Alternatively, if we want to spend 40 minutes dive time at 30m on air we will need to make stops of 1 minute at 9m, and 9 minutes at 6m. On EANx36 we would need only 1 minute at 6m. (Note: this will only work for the first dive using current BSAC'88 tables since the surface interval is carried out on air, a different gas to that used during the dive).

A "nitrox dive" could be a dive carried out almost entirely on air, perhaps in the 40-45m range, for which air is quite suitable, with a nitrox mixture (probably between 50% and 80% oxygen, or even pure oxygen) used only during the decompression stops. This will still give faster elimination of nitrogen and shorter decompression times.

Another approach to improving your safety margin is to dive on nitrox, but to treat it as air for decompression purposes. To enjoy this benefit you breathe nitrox during the dive or the decompression stops, or both, but use your usual air decompression table or air dive computer to control your decompression procedure. This is an approach which could have an appeal to the more careful, older, less fit, or less frequent diver as it allows you to keep comfortably within the recognised safety limits.

Should you have one of the latest generation of nitrox dive computers then you can gain all the benefits of reduced nitrogen intake due to the gas breathed, along with those due to a possible multi-level dive profile. Before the dive you enter into the computer the oxygen percentage of your gas mix and the computer deduces the balance to be nitrogen, and calculates the decompression requirement accordingly. Naturally, it will work equally well for air diving. A nitrox computer has the added advantage of tracking your oxygen exposure to ensure that you do not exceed the recommended CNS toxicity limits.

It has been suggested that the use of nitrox reduces the narcosis effect, but there is no scientific evidence to support this. The solution to the nar-

cosis problem is trimix, which reduces the narcotic effect of nitrogen by replacing a part of it with helium. Another observation is that diving on nitrox results in a lower consumption rate, since the diver enjoys a higher PPO₂ during the dive, but this has not yet been demonstrated scientifically.

What are the problems?

While reducing the nitrogen content brings some advantages; increasing the oxygen content introduces some new problems. We have all learned that oxygen becomes toxic when breathed at higher partial pressures, and that at 66m normal air has reached the maximum recommended limit of 1.6 bar PPO₂. When we take the advised limit of 1.45 bar then we find that EANx32 has a maximum depth limit of 35m, EANx36 is limited to 30m, and air to 59m. Clearly, nitrox is not a gas for deep diving.

An additional problem represented by oxygen is that it can have a toxic effect on our Central Nervous System if we are exposed to higher concentrations over longer periods. For normal recreational dives the required exposures are longer than we are likely to meet, but can be built up over a series of dives. If we are diving to 30m on EANx36 (PPO₂ =1.44) then our maximum exposure should not exceed 120 minutes at that depth, which would give us a number of other problems as well (gas supply, decompression times, cooling). Over the course of 24 hours our time spent at this PPO₂ should not exceed 180 minutes. These exposure times get substantially longer at lower PPO₂ levels.

Oxygen in high concentrations can also give problems in its handling and use. Oxygen has the property of supporting combustion, although it is not itself flammable. When it comes into contact with certain substances, such as hydrocarbons at high pressure, there is a risk of explosion. Any part of our diving equipment which stands a chance of coming into direct contact with high concentrations of oxygen must therefore be scrupulously clean and free from any such contamination. The first candidate is our diving cylinder which, along with its valve, must be cleaned for oxygen use, known as 'in oxygen service', since the procedure for filling it with nitrox could start by introducing a quantity of pure oxygen into the cylinder. Our standard air regulator should be suitable for use with nitrox mixtures containing up to 40% oxygen, but if we wish to use it for higher concentrations, such as decompression mixes, then this too must be cleaned for oxygen use and never used with normal air.

What we need to do to go deeper is reduce the oxygen content, to avoid toxicity problems, and reduce the nitrogen content, to avoid narcosis problems. This usually means making up the balance with helium. Now while helium helps considerably with the narcosis problems of deep diving, it brings no decompression advantage, and will even increase decompression times on shorter recreational dive exposures. For deeper diving we can continue to reduce

the oxygen content, and replace all of the nitrogen with helium, to give a mixture called Heliox. Unfortunately such a Trimix or Heliox deep-diving mixture would have such a low oxygen content that it would be unsafe at shallower depths.

Helium has two major disadvantages; it is horribly expensive, and it cools you down faster than when breathing air. Thus trimix and heliox diving bring additional problems of cooling, which are further aggravated by the longer decompression times involved.

As we can see, there is almost an optimum mixture for each depth range, depending on how long you need to stay, and the thermal factors. The well organised Technical Diver will carry a travel mix suitable for breathing from the surface down to a reasonable depth, and will then switch to a bottom mix, lower in oxygen content, for the time at depth, and during the return to the surface will have to switch back to the travel mix, with the additional possibility of a decompression mix, with an even higher oxygen content to give optimal nitrogen elimination, for breathing during the shallower decompression stops.

Just in case this sounds simple to some of you, you may not have grasped the complexity of a dive which relies on identifying and breathing from the correct regulator, attached to the correct cylinder, for precise phases of the dive, while always ensuring that you have enough of each of the required gases available and in reserve for each phase.

The problem of carrying large amounts of gas with you on a dive is a real one. The best solution is to use the gas more efficiently, and that means to rebreath it so that the oxygen content is used more fully. A rebreather used with normal air (21% oxygen) allows each breath to be recycled about four times as only about 5% is used during the respiratory cycle. A set fitted with a standard 10 litre cylinder would last about as long as a twin 2 x 20 litre set on open circuit. Alternatively, a much smaller cylinder can be carried, and if this is filled with Nitrox, then even greater gas efficiency can be achieved. Rebreathers therefore achieve major efficiencies in gas usage, but have a high initial cost. They also demand far greater care and attention, and considerable maintenance, compared with SCUBA.

We have mentioned in passing a number of commodities, the gases and mixtures, which are not yet easily available, and are all more expensive than compressed air. Dive centres equipped to fill your dedicated nitrox cylinder with the appropriate mixture are still few in number, and this will only change as a result of increased demand. A fully-equipped mixed gas blending system requires a major investment on the part of the filling station. Alternative methods of providing the gas mixtures exist, but they too are logistically more complex than simple air filling, and this must be reflected in the cost. Nitrox is usually the result of adding a prescribed

amount of oxygen to air, and breathing oxygen is a gas which is relatively easy to obtain and not unreasonable in price. Once helium enters the scene then the price of a fill escalates. A helium mix can cost as much as 20 times the price of compressed air. But in a closed circuit mix rebreather the amount of helium actually consumed is very low, making it economical
o n c e m o r e .

What training is available?

If you are already a diver, a BSAC Sport Diver, CMAS 2 Star Diver or equivalent, with some additional experience then you have the base required. If your qualification is higher than this, then that can only give you an advantage. However, in all cases there will be material to be covered which you have not met before, as well as some useful revision of things which you should remember from earlier training.

Where should you go for this training? If you are a BSAC member, then you will soon be offered (end of 1995) Skill Development Courses leading to BSAC Nitrox Diver and BSAC Advanced Nitrox Diver. The Extended Range Diver course is also in hand.

An alternative choice is to go to one of the specialist agencies : IANTD (International Association of Nitrox and Technical Divers), TDI (Technical Diving International), or ANDI (American Nitrox Divers Inc.). They all offer a path starting with nitrox diving and continuing through other Technical Diving courses toward Trimix use, and eventually Rebreathers.

These are the early days of rebreather training for amateurs and the specialists are now developing their training courses. However, the pattern of first understanding how rebreathers work in general terms, and then going on to learn how to use a specific set, seems to have been adopted. Most of the rebreather manufacturers have contracted with one or other of the specialist agencies to supply the training for their equipment, and it will often be packaged with the equipment cost since no sale will be made to uncertified divers. Given the high cost of the equipment, it is likely that courses will also be available for divers who wish to qualify as users so that they can hire the equipment for those special expeditions.

A good starting point would be "An Introduction to Technical Diving" by Rob Palmer, available from the Diver Bookshop, £17.95.

If you are a travelling diver then it is worth noting that CMAS (World Underwater Federation) should soon have international equivalents available for a Basic Nitrox Diver and an Advanced Nitrox Diver. This will allow their member organisations (BSAC, TDI, IANTD, etc.) to apply for equivalents to their certificates for issuing to their members. A degree of cross-recognition of certificates will soon be in place between these organisations.

Should I get involved?

Just answer these simple questions :

1. Do you feel the need to lengthen the no-stop times of your dives in the 20-35m range?
2. Do you regularly do dives with long decompressions in the 20-35m range?
3. Do you feel a need to increase your safety margin beyond that which you practise currently?
4. Do you accept that you will probably have to dedicate one or two cylinders and one or two regulators for nitrox-only use?
5. Are you ready to accept strict maximum depth limits on your dives?
6. Do you accept the need for some additional specialised training, whatever your current level?
7. Do your long term aims include silent, bubble-free, constant buoyancy diving?

If you answered 'yes' to at least three of these questions, then it is time you started considering taking the first steps.

If you answered 'yes' to 5 or 6 questions, then you have probably already started, or are about to.

Whatever you decide now, we are bound to see a continuing evolution in the techniques and possibilities offered by new diving technologies, and there will always be new developments to convince you that the time has come to take a step forward.

It is generally accepted that breathing Nitrox mixtures on open circuit SCUBA equipment may not give you the result you need for some of the more serious diving projects. However, it provides a valuable bridge from sport diving techniques and disciplines to the more advanced techniques and stricter disciplines required for trimix and rebreather diving. Although considered a major step today, Nitrox will probably come to be considered a standard recreational diving gas within a few years.

What are the objectives?

Although the immediate objective is to benefit from the advantages offered by nitrox, in all its applications, the main attraction in following the Technical Diving path is to make the leap to rebreather technology.

The attractions of the rebreather probably outweigh for most of us any trifling problems such as cost. The first rebreathers to be offered to the non-commercial, non-military diver will seem to be highly priced, but will surely come down in price as they gain in popularity. Prices quoted today range from £5000 to £10000 for different specifications. But if you count the cost of a fully rigged technical diver's kit it too soon achieves horrific proportions. And don't forget the real economies in gas cost per dive that are possible with the rebreather. But most of all, consider the advantages of a relatively lightweight and compact set which gives you silent, bubble-free, constant buoyancy diving, the dream of every photographer and marine biologist.

Although the cost of specialised rebreather training will probably be part of the package in most cases, it is a real factor for would-be rebreather divers. Adequate familiarity with the equipment needs at

least a week of training before the proud new owner, or renter, can be let loose with the equipment.

In summary, the objectives of Technical Diver Training should be to give the diver a wider range of techniques and knowledge so that the right choices and decisions can be made for each dive, with never a need to compromise on safety. The techniques and disciplines acquired should not encourage the diver to undertake greater risks, but rather to reduce the risk through a more thorough approach to planning and executing a dive.

Although the activity places a heavy emphasis on equipment and technology, none of this will be of any use if the diver does not first accept the need to approach it with the right attitude. Do not expect the passage to Technical Diving to be an easy one; it is intended to make you careful, responsible, thorough, fastidious, and aware of your new limits. You will find yourself more often at the limits of our knowledge on diving physiology; the more experts you meet, the more often you will hear the reply "We don't know, yet."

Take care when exploring the frontiers, it is all too easy to stray from the beaten path.

Some definitions.

ANDI : American Nitrox Divers Inc.

EAD : Equivalent Air depth.

Heliox : A breathing gas mixture containing oxygen and helium

IANTD : International Association of Nitrox and Technical Divers.

Nitrox : Also known as 'oxygen-enriched air', 'SafeAir' (registered to ANDI), EANx (Enriched Air Nitrox). A gas mixture containing nitrogen and oxygen, where the oxygen content exceeds that of normal air (21%). Generally expressed as Nitrox XX, or EANxXX, where XX indicates the percentage of oxygen in the mixture.

PPO₂ : partial pressure of oxygen in the mixture breathed. BSAC recommended limit for this is 1.40 bar for in water use. Overall recommended limit by all agencies is 1.6 bar

PPN₂ : partial pressure of nitrogen in the mixture breathed.

TDI : Technical Diving International. (TDI Europe, Unit 7, Elliott Road, West Howe Industrial Estate, Bournemouth, Dorset. BH11 8JX, U.K.

Trimix : A breathing gas mixture containing oxygen, nitrogen, and helium.

Diver of the Year 2000 Nominee

Nominee's Name :

Reason for Nomination :

Nominated by:

(Required for entry into the prize draw)

Please return to DO or Dry Officer before 11/00.