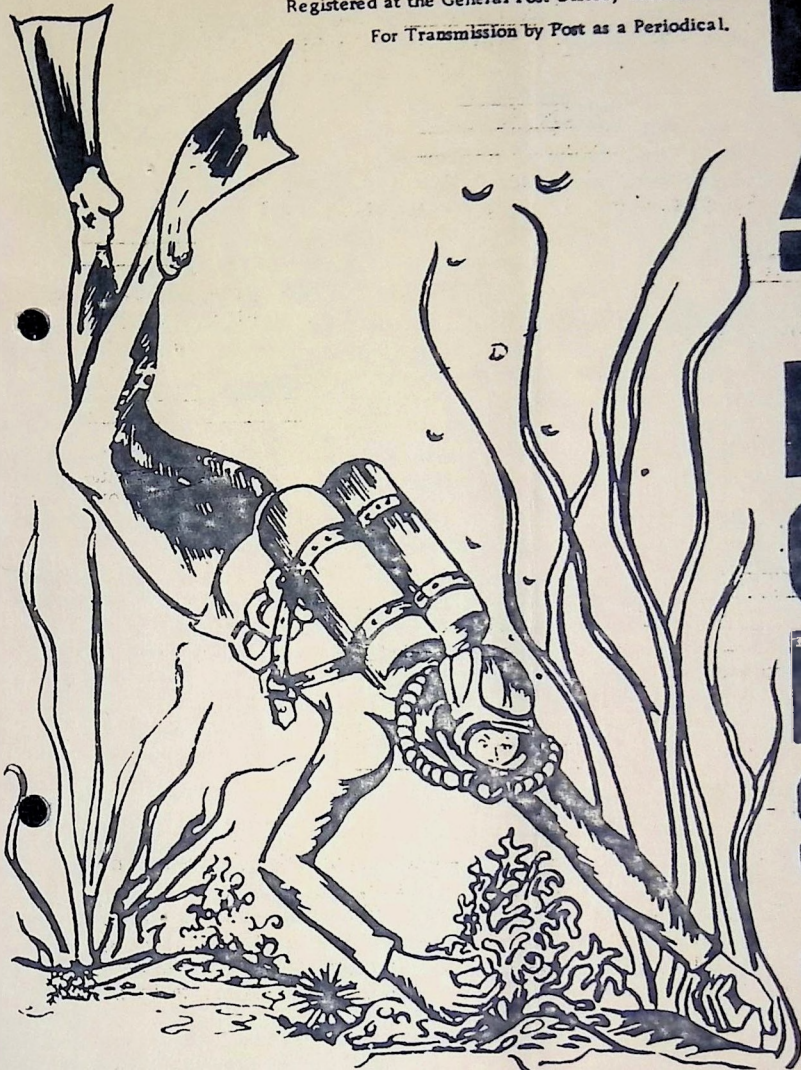


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FATHOMS



VICTORIAN SUB-AQUA GROUP

F A T H O M S

(Official Journal of the Victorian Sub-Aqua Group)

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CLUB MEETING -

The next meeting of the Victorian Sub-Aqua Group will be held on Wednesday 19TH JULY, 1978 at the Celtic Club, 320 Queen Street, Melbourne. The meeting will commence promptly at 8.00pm. Members are requested not to bring drinks up to the meeting room, but reminded that the facilities of the club are available afterwards for a sociable conclusion to the evening. Visitors welcome.

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FOREWARD

This month sees the conclusion of our Project Stickybeak articles. I hope that you have found them interesting, and have learnt something from them. In the "discussion" printed this month, you will see that many of the deaths occurred on or near the surface, so have a think about that. How fit are you and have you had a medical check-up lately, these should be a couple of questions to ask yourself while you can. This month we also have articles on decompression sickness and hyperthermia, the latter being of significance now that winter is upon us.

Being the editor of our magazine is fast becoming an easy task. Whereas a few months ago I had to implore you all to contribute, I now find that I have only to fit the articles together and can even hold some over for following months. This means that I don't have to set to and churn out filler articles to swell the pages. It also means that the club magazine has an interesting content reflecting the clubs activities and member's interests, so keep the copy flowing.

With the waning of the club year the "fight" for the "Clubman of the Year" trophy is hotting up and once again we look set for an exciting, close finish. It certainly reflects the keenness of our competition, when, after a year of fierce but friendly rivalry, only a couple of points usually divides our place getters. The winner normally is a regular diver, who is involved deeply with the week by week running of the club, so therefore it comes as no surprise to learn that in the six years we have had this award, it has been carried off three times by the incumbent club president, who will it be this year?

Raffle ticket sales for SDF have been progressing well, now all we have to do is wait and see if any of our numbers are drawn out on September 1st at the dance. If you still haven't got either the raffle tickets or got your name down for the dance see either jovial Pete Oakley, or the lovely Julie Okle or the volatile Johnny G. who will all be able to satisfy your needs.

In November the Milk Board are going to sponsor the Big M Marathon, this will be a run from Frankston into the city. We sent our roving reporter around to talk to our "star" athletes to find out if any were going to participate. At the time of going to press, Fathoms can announce that we do have one definite starter for the epic run on November 5th. Anyone who is interested either in running or in

assisting our as yet lone entrant over the 26 odd miles please contact the editor who will then if necessary, book another hospital bed.

Finally an item of interest to us all as divers breathing compressed air. As from this month all air fills in Victoria will cost \$2.00 regardless of tank size, so be prepared.

ED.

NOTICES -

SKIING

Remember the annual ski weekend will be at Mt. Hotham over the 29th & 30th of this month. Any problems contact Jay Cody 846-1313

S.D.F. DINNER DANCE

This will take place on Friday 1st September at the Tudor Court 141 Kooyong Road, Caulfield at 7.45pm \$16.00 per head all found.

We intend as we are organising it, to make it the best yet. You will have a chance to meet fellow divers from all over Victoria and have a good time to boot. Tickets available from the Terrible Trio Pete, Julie and Johnny G.

GENERAL MEETING

Just a reminder that we did agree that drinks should not be brought up to the meetings, so could we please have your co-operation in this. The bar is open after the meetings finish, so you can take the discussions to the bar for a pleasant end to the evening.

NIGHT DIVING AROUND SORRENTO PIER

Around 6.15pm on Saturday 17th, the stalwart fishermen of Sorrento Pier were given a bit of a shock when seven VSAG divers arrived to join their fishy targets under the water. It was a good night for diving, the water flat, the air warm and an almost full moon above.

The water looked reasonably inviting, and due to the stillness of the night looked a lot further away than it actually was. We elected Fred to do the right thing and in he went, finding to his surprise that in fact the water was only a few feet away. As nothing seemed to want to molest Fred we all went in.

The water was not cold and even without our torches we had some vision on the bottom, and looking up we could see the moon. We had a trip up and down under the pier and a visit to my bottle area, to no avail I'm afraid. It was easy seeing one another and the only problem was the sand kicked up by divers in front, however the current effectively cleared this away quickly. We moved out from the pier in the direction of the reef to the left of the pier, swimming against the incoming tide. Not much fish life evident, some small ones, and a few small crabs scuttling across the sand. We were reminded of the presence of other divers in front of us by the small clouds of drifting sand which occasionally drifted over us from out of the darkness ahead. Eventually about 30 feet ahead we could see the gleam of their torches, and we joined up with Tony and Carl hoodless as usual. Then it was time to return to the pier drifting back along the bottom until we bumped into the pier's columns. Then we eased between them to make our way to the ladder. Here it was possible to swim without torchlight aided by the moon and finally by the light atop the pier itself.

We emerged into the night air somewhat reluctantly, we had all been in around an hour, and the time had flown by. Everyone enjoyed the dive. As we came out another group of divers was preparing to enter the water so obviously Portsea Pier is a popular haven for night divers. Luckily the night was not too cool and we were able to change comfortably. Tony gave his impression of the Naked Vicar now, and was told by a passing constable, "Miss, put your clothes back on", which just goes to show that the new blue suit must let a lot of the cold in.

Lastly our gallant cast in alphabetical order commencing with, Georgie, Mária and Wendy who got colder on top of the pier than us under it. Then we had Carl, Carol, Fred, Johnny, Neil, Tony and myself.

BRIAN LYNCH

DIVE CALENDAR

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>DIVE CAPT.</u>	<u>NOTES</u>
JULY 15,16	DEAL ISLAND (Hopefully)		J.Goulding 25-2883	
JULY 16	FLINDERS	10 AM	D.Moore 547-2791	
JULY 19	GENERAL MEETING	8 PM		Celtic Club
JULY 29,30	SKI WEEKEND		J.Cody 846-1313	
AUG. 6	MYSTERY DIVE Clue No.1. Add 2&2 and then be prepared to dive under, what is over to win the prize		D.Moore 547-2791	
AUG. 16	GENERAL MEETING	8 PM		Celtic Club
AUG. 20	SORRENTO Boat Ramp	To be advised	P.Tipping 387-2027	
SEPT. 1	S.D.F. DINNER DANCE			
SEPT. 3	FLINDERS PIER	10 AM	B.Lynch 795-2834	
SEPT. 17	SORRENTO OR TORQUAY	To be advised	M.Synon 465-2812	
SEPT. 20	ANNUAL GENERAL MEETING			Celtic Club

THE GOORANGI' REVISITED

The 21st May started out as a windswept Sunday morning when all but the over-optimistic would consider that diving was out of the question for the day. However several years of experience have taught me not to be daunted by Melbourne's unpredictable weather and to push on regardless. As luck would have it, a few of us had a great dive on the Eliza Ramsden, and taking advantage of the unusually long slack water period we moved across to where several boats were anchored, to find we were sitting on top of the 'Goorangi'.

The Goorangi had been a R.A.N. minesweeper which sunk with all hands after being run down by the troop carrier 'Duntroon' in 1940. Sometime afterwards the Navy exploded the wreckage of the Goorangi as was proper for the finale of a fighting ship of the flag.

It seemed that there was only one group of divers who knew the true bearings of the Goorangi's remains and they were not giving any secrets away.

As we had searched for the wreck for several months we were not going to let this opportunity pass to get a 'fix' on where she lay. In total we took 9 different bearings and with this store of knowledge we returned on the 5th June.

On nearing the "reckoned position", Paul Tipping and Brian Lynch went over the side of Lil 'Ab to do a drift dive and buoy the wreck. In less than two minutes they had attached a marker buoy and commenced their dive. Although the buoy was dragged under water with the swift flowing flood tide we knew that it would surface again at slack water.

Lynch and little Pauly surfaced after 15 minutes and we headed back to Sorrento for some lunch.

Barry Truscott joined us for the afternoon dive and again we went to the Goorangi and waited for our buoy to surface. Our navigation again proved to be correct for the buoy popped up less than 50 feet away.

This time Barry, Tony and I dived and found the twisted remnants of this once proved ship.

Although the Goorangi is now very much a dead ship it provides the skeleton of a very-much-alive artificial reef abundant with colourful sponges and rich in fish life.

The Goorangi is a lot smaller and far less impressive than the Eliza Ramsden, yet it has its own fascination in that it is relatively modern and is scattered on the otherwise barren sandy bottom as a vivid reminder of the destructive force of man.

JOHN GOULDING

The following article concludes the Provisional Reports on 1976 Australian Diving Deaths by Dr. Douglas Walker.

Discussion

The primary lesson one can draw from these eleven case histories is that one can never afford to hold the sea in disrespect. It is necessary to be able to swim and to master the snorkel, a piece of equipment too little respected, even for calm water safety. The frequency of the fatal pattern of events developing in divers at the surface illustrates that one is not home and dry until safely out of the water and the dive plan must take account of this fact. The surface layer is the killing ground for those whose training and equipment are not up to the demands of the occasion, the rapidity with which death can occur making the prevention of the aspiration/unconsciousness/death progression preferable to an overoptimistic belief in the efficacy of resuscitative measures in such casualties. Though reliable buoyancy vests were of value to several of the survivors, none of the victims had such aid. The failure to function of the vests of the two victims who had them confirms the belief of many that CO2 inflatable vests are liable to failure at the crisis time, which at the very least must be had for the user's morale. Both cold water and worsening sea conditions are significantly noted by survivors and lack of buoyancy, with little or no remaining air, aggravate the risk of exhaustion and compounds - the - problem of making a safe landfall.

On one case the fatality was due to a "heart attack" in a diver separated from his friends. This raises the question of fitness to dive. It is unfortunate that the victim's medical history is unavailable but the experience gained from the examination of Australian airline pilots over a ten year period has been that there is a poor predictive score from the routine examination and resting ECG when checked against later events. Of the twenty pilots in the study who suffered coronary thrombosis only one was "predicted" while

three infarcts occurred un-noticed between routine ECG checks. Few of the pilots who were disqualified from flying on the basis of ECG changes were known to suffer a later coronary thrombosis. Of course none of this group had admitted symptoms. One other victim was said to be obese, with the implication of reduced fitness. Both these cases also involved significant factors additional to the health problems.

A better assessment of sea conditions, an adequate reserve of air in the tank for the return from the dive and a reliable buoyancy reserve are basic requirements for even the "certificated and experienced" who wish to reduce the odds against them. It is advisable to fit a submersible contents gauge, and be guided by it. And look before you leap into the water. As always, THINK.

TABLE 1

Case	Information Source	Age	Skill	Vest	Buddy	Air Status	Brief Notes
BH1/76	Inquest	26	nil	no	no	-	alone, 3' deep calm sea
BH2/76	Depositions Report	24	slight	no	no	-	poor swimmer calm sea, 44ft deep
SC1/76	Depositions	45	slight	no	sepn.	???	1st open water dive: CT
SC2/76	Depositions	36	C-card 1 year	no	sepn.	off	surface, calm sea
SC3/76	Inquest	40	C-card	no	no	full	professional diver killed by propellor
SC4/76	Depositions Report	20	C-card	no	sepn.	low	COLD, rough; waved for help surface buddy vest
SC5/76	Inquest	21	C-card	FAIL	sepn.	satis	surfaced from 100ft; calls for help

Case	Information Source	Age	Skill	Vest	Buddy	Air Status	Brief Notes
SC6/76	Depositions	55	30 yrs	FAIL	YES	satis	COLD; lost mask; washed off reef; rough water
SC7/76	Depositions	32	slight (hookah)	no	sepn.	empty	COLD; rough; dropped wts, tank; surface
SC8/76	Inquest	18	nil	no	YES	full	rough sea entry off rocks
H1/76	Inquest	23	trained	no	no	**	supplied oxygen at 70ft.

KEY:

Depositions = statements of witness as to police at incident time
 Inquest = witnesses with statements before the Coroner
 Report = direct "Stickybeak" report by a witness
 Buddy YES = Buddy present and active help all critical times
 " sepn. = Buddy separated at critical time of the incident
 " no = dived or swam alone on the incident dive
 COLD = witness assessment that this a significant factor

HYPOTHERMIA

The following passage is taken from the notes and lecture delivered by Dr. John Knight at the FAUI training program in 1977. I thought it appropriate to publish this article now because July, August and September seem to provide us with our coldest water for diving:-

Victoria is unique in many ways. Not only do we have dirty water and unpredictable weather to contend with, but also cold water. The temperature of Victorian water ranges from a maximum of around 18°C in January to a minimum of about 11°C in August.

The human body operates most efficiently at a temperature of 37°C (97°F). This is known as the core temperature. It is measured deep within the body and not on the surface of the skin. The body attempts to maintain this temperature within a very small range. If the core temperature rises the body compensates in 2 ways. Surface

blood vessels are opened up and the blood can lose heat directly to the atmosphere. Perspiration secreted by the body evaporates from the skins surface and thereby cools the body. If the temperature drops below 37°C heat is conserved by shutting off blood flow through the extremities and by shivering which is an involuntary muscular action which helps to generate heat.

If despite these efforts the core temperature drops below 37°C a number of signs and symptoms become apparent.

35-36°C - shivering, peripheral numbness, difficulty in performing co-ordinated fine tasks, loss of muscle power, increased discomfort, fatigue and general apathy cyanosis.

40°C - confusions, disorientation, temporary amnesia

33°C - shivering replaced by continuous muscle rigidity

30-32°C - heat irregularities, unconsciousness, dilated pupils

24-25°C - death

The body loses heat far more rapidly in water than in air at the same temperature.

Chilling if not severe enough to threaten life leads to a loss of co-ordination, a decrease in the ability to think clearly and difficulty in the performance of fine tasks. Swimming ability is decreased with increasing discomfort and fatigue. As a result of the constriction of peripheral blood vessels, there is an increase in the central blood volume which causes an increase in the rate of urine formation and the subsequent need to empty the bladder. As hypothermia progresses however heart function is affected and the amount of blood pumped per minute is decreased leading to decreased urine output. A further effect of hypothermia is an increase in blood viscosity and a decrease in the rate of oxygen delivery to the tissues leading to tissuehypoxia.

In serious cases the treatment is to maintain respiration and circulation while rapidly rewarming the diver by placing his body in a warm bath and elevating the limbs and head out of the water. Immersion of the limbs may cause death by causing the blood vessels in them to open up and overload an already enfeebled heart. For less serious cases a hot shower may suffice. Wetsuits may be left on during this treatment. The temperature of the bath should be initially around 36°C and raised rapidly to 40°C. Since this warming can be fatal it is advisable for it to be done in a hospital. The best first aid treatment is to use the body heat of several

people huddled around the patient. Skin-to-skin contact is the most efficient way to do this. Wrapping the patient may also be of some value. Alcohol is detrimental since it causes dilation of peripheral blood vessels. Marihuana also acts to stop the blood vessels being shut off to conserve heat.

In mild cases the only treatment is common sense. Get out of the water and warm up. A second dive should not be attempted until the body is able to perspire.

Hypothermia can be prevented or lessened by wearing some form of insulating garments, increasing the amount of fat under the skin decreasing exercise and adopting a huddled position in the water, to minimise the area of contact with the water. The body is capable of acclimatisation to cold but this takes a long time.

Clearly the best solution for a sports diver is to wear a good wetsuit. Any leaks should be patched up so as to stop cold water continually flushing out the warmer water next to the skin.

It should be remembered that the insulation properties of neoprene decrease with depth due to compression of the rubber. Therefore in deep dives a diver is likely to experience a greater heat loss per unit time.

Even after getting out of the water heat continues to be lost from the deep tissues and the core temperature may drop to a point where the symptoms may become serious. It takes several hours to restore all lost body heat.

Commonsense is the best prevention of hypothermia in sports divers. Take along a thermos of hot coffee or soup to drink when you get out of the water. Remember that the effects of hypothermia take a while to wear off, particularly fatigue and mental dullness. So don't try to drive home immediately after a dive since sleepiness and increased reaction times increase the possibility of an accident.

Submitted by T. TIPPING

P.S. This article was not intended to scare people away from winter dives, nor do I have shares in Vulcan wetsuits. (T.T.)

TIP'S TIT-BITS

One of the most important issues thrashed out at the June General Meeting was the location of the Christmas trip and Jervis Bay looks like being the popular choice. Those who went in '76 can expect better facilities at Huskisson; sealed roads and modern toilet blocks; even the R.S.L. club extensions have been completed. We'll even have a far more comprehensive knowledge of the best dive sites, but unless we get more boat owners interested your chances of getting a dive will be about one in three!

The night dive was great on 17th June - flat seas good visibility warm enough, plenty to see etc., but the entertainment that followed was better still. Mellie got together with Pauline and Antoinette who offered their Somers hideaway for the weekend so Frederica and Wendel, Joan and Murray, Carla, Les, George and Ciril could all shack up. Highlight of the night was Carla's act - striptease to Tubular Bells with stroke lighting effects supplied by Dacor and Ikelite!

As we all know the planned attempt to dive Gellibrand lighthouse was aborted but with Pete Oakley in charge we hit on excellent conditions somewhere out the back of some Peninsula. Over 14 pounds of cray were pulled together with a sizeable feast of abs - incidentally the staff at Brendan Edwards thoroughly enjoyed their 8.6lb lunch next day!

Footnote: Would someone please be kind enough to send Johnny Goulding rules, regulations and specifications regarding the taking of yabbies in Victoria.

Golf: Look out A team! Jay Cody captain of the "B" team thrashed 2 members of the "A" team (who incidentally are brothers but wish to remain anonymous) by five and six strokes respectively on 25th June out at the Yarra Valley Country Club. After the first nine Jay who was three strokes behind gestured to us to quench our thirsts with a drink of Yarra Mud (no doubt the tap water on the course.) It was later found out that Yarra Mud is a cocktail: 1 oz coffee liqueur, 1oz vodka, 1oz island cream liqueur topped with coke. No wonder the subs are so high at that club!

Quote of this month has to go to Maree James on the weekend the whole gang propped at Somers. You see the girls decided to play golf on the Sunday while the fellas dived but next morning Georgie (who's recently tackled a diving course with Peninsula) decided to pike

as it was wet. Said Maree: If it's too wet for her to play
(expletive deleted) golf what's she going to be like when she's
(expletive deleted) diving!!!

THE DAY JOHNNY LOST HIS VIRGINITY AND WAS UPSTAGED BY TONY TIPPING
(WHO ISN'T)

The Sunday 11th dive on the Gellibrand light was shelved as it was reported to be a mud crawl. The alternative site, Goorangi wreck was aborted as the moderate northerly was chopping up the bay. So seven divers set forth from Flinders to try the sheltered offshore area between Flinders and Cape Schanck.

While 14 divers had telephoned as possible starters, only 7 turned up, with the 8th Dave Moore and the 'Italian Job' missing us at Flinders by 2 minutes. Better luck next dive Dave! Thanks to the two boat owners Peter Smith and Tony Tipping we set off towards Cape Schanck, where we could see the swell caused by the incoming tide.

We had a brief look at the bottom 35' depth boulder rock and weed but not promising, so we headed towards Cape Schanck and stopped at a more sheltered head. The exact location is for sale, for as soon as we reached bottom 45' x 25' vis under a ledge 8 little crays sat all in a row.

Johnny with amazing dexterity and the help of an obliging cray, managed to catch one - and thus lost his virginity. (In fact I am certain catcher and catch were virgins at that game, and, as when praying mantis mate, only one survives.) Immediately we surfaced to break the good news, and returned to get more, unsuccessfully, in the strong surge we settled for some abs.

When we surfaced Tip and Brian insisted on a guided tour to the ledge, Johnny obliged. At the bottom en route to the ledge Tip was embarrassed to find a 8.6lb cray dangling from his wrist and cutting off all circulation to his hand, so he surfaced for help. This big daddy in the boat back he went to find two more missing their parents. Brian swears one should have been his but settled for another type of 'find'. Both Pete Smith and Carl had seen the crays with out retrieving any, while Paul shot off his 36 exposures.

As an accolade to Johnny, Carl swam between the boats with Paul's smokes and did not get them wet - gallantly done sire.

All divers safely back, boats ashore, four of us retired to Somers to feast on fresh cooked cray and abs a la Goulding, beautifully cooked. Pity there was only two bottles of beer between 4 divers! A great day to get back into diving.

PETER OAKLEY

Concluding the report on the excavation, wrapping, lifting and transportation to Launceston of the anchor and cannon of the ship "Sydney Cove".

UNCOVERING THE CANNON:

The previous evening at debriefing, it has been decided that it would be preferable to lift the cannon found on 2/5/78 if it had no gun-carriage, rather than the one found during October 1977. This was because the "October" cannon was concreted to No. (2) anchor stock as well as the remains of its gun-carriage and would require several days painstakingly slow excavation work, which time was not available.

Ken Atherton and David Carroll started excavating the "new" cannon from the southern-most point (the muzzle) using ejector pumps, one on each side. After about an hour, the cannon had been cleared on all sides but was still supported along its entire length by sand and shell grit. At the breach end, it was found that two coils of heavy 3" diameter hemp cable were partially concreted to the pommel area. They were carefully separated from the cannon.

At 12.30pm, Peter Alexander relieved Ken Atherton at the pump who then commenced triangulating the position of the anchor with Graham Henderson, while Bob Tyson, Ken Trebilco and Peter Mooney sided in both tasks.

Lifting of the cannon was commenced until it was supported at the breech end and about 25cm short of the muzzle end only. At this stage, sideways pressure on the cannon was seen to produce sideways movement so excavation was stopped. Underlay strips were tied around the barrel in front of and behind the trunnions and then the two 44 gallon drums (Nos. (5) and (6)) used for lifting the fluke end of anchor (2) were attached and air was added progressively. After each drum was about half filled with air, movement was detected and the cannon gently floated upwards to drift off in the same direction as the anchor (2) previously. When it was within 20 metres of the anchor it was submerged and buoyed as before and the drums removed.

After this, the holes formed by the excavation were filled in. The main items found under or around the cannon were the heavy cable and curved iron bands covered with braided hemp coverings. These were not removed.

RAISING THE ANCHOR AND CANNON FOR TRANSPORT:

5/5/78

At 9.00am with Ken Atherton filming the work for records, Bruce Benseman and Peter Mooney tenders in a Brooker V14 aluminium runabout above, David Carroll rigged first the cannon and then the anchor for lifting. 12mm diameter nylon rope was used to sling the anchor both near the muzzle and near the breech, with the carpet underlay affixed on the 4/5/78 as protection for the cannon from the slinging ropes. The loop for the ship's crane was formed using the 12mm slings and 5mm lashing.

The anchor was rigged up for lifting using a heavy duty 38mm diameter nylon hawser at the heavy fluke and a 13mm nylon line at the stock end. A conventional sling was used on one side but because of the way the anchor was resting on the bottom, multi-bindings of 5mm rope had to be used in conjunction with the 38mm hawser at the other end. Similarly, the stock end was slung and a lifting point for the crane hook was formed. The market buoy line was then shortened until the buoy was directly above the anchor and the same was done with the cannon.

At 9.45am, the "Flinders Trader", a 106 ft. long steel cargo vessel which had detoured from its normal Whitemark-Launceston run under Captain Peter Donaldson, arrived at the site. David Carroll transferred to the boat of Mr. Frost, a local abalone diver from Lady Barron, and Mr. Benseman and Ken Atherton went over to the Flinders Trader to arrange the pickup.

The first lift was of the cannon, at 10.00am David Carroll guided the ship by signals until the crane hook was in the required position and then submerged to attach the slings. The cannon was then lifted and placed on truck tyres on the starboard side of the ship. At 10.15am the same procedure was followed for the anchor. This was placed on the deck on the centre line of the ship, after which the cannon was lifted again and placed on a large sheet of plastic on the tyres. The plastic was then folded over the cannon and tied. This was to help drying out of the object during its trip.

The Flinders Trader then left for Launceston with Mr. L Jensen responsible for keeping both cannon and anchor wet at all times.

At Launceston, both relics were transferred to a local Council reservoir where they will be both kept until facilities for preservative treatment are available.

D. CARROLL

FLOTSAM & JETSAM

We're sorry to all those divers who had expected a dive with a difference on the remains of the Gellibrand Lighthouse on June 11th. Dive Captain Dave Carroll and Max Synon checked the site out a week earlier, only to report that the bottom was covered in black oozing mud, which silted up as soon as a divers fin disturbed the water.

Dave and Max, both veterans of other black water dives saw fit to change the venue and fortunately the Flinders area was selected for the club dive.

It's a pity that Bazza didn't turn up to give the 'mouth' some competition. In between a repeat of the way he won the Fun Run, Tony managed to pull an 8½ pound crayfish. Actually it was a question of who was pulling whom, but as Tony surfaced with a wide grin on his face we went go into the ins and outs of that one.

Big brother, 'Little Pauly' copped his fair share of abuse for not saving some film to record Tony's epic achievement.

Tony's was not the only cray taken that day. Johnny tells us that his crayfish cock-tale was the highlight of dinner for Minnie's guests that evening.

The Oceans '78 Congress has come and gone and anyone who attended must have been greatly impressed with the quality of the films, talks and exhibitions.

This congress is now in its fifth year and has gained world wide recognition and placed Victoria in an esteemed position as the diving capital in Australia. We may not have the warm clear waters of the Barrier Reef or the wealth of bullion of the Western Australian wrecks but we do have a wide variety of some excellent diving and a hard core of enthusiastic people who are prepared to contribute so others can enjoy.

Well it had to come --- a successful night dive. Seven divers lined up at Portsea Pier on the 17th June at 6.15pm and jumped into

the flatest, smoothest, most inviting water I have ever seen on Port Phillip Bay.

Murgatroyd and I had played golf at Sorrento that afternoon and on seeing the water some hours later I was sorry that I had not taken the opportunity for a dive in daylight.

Nevertheless the night dive was excellent. Under torchlight the visibility around the Pier and Portsea Reef was about 35 to 40 feet. Not even the water seemed cold. However there was a real lack of fish life. My last night dive at Portsea was about four years ago and fishlife at night was abundant.

The following day we dived the good old Portsea Hole, but the tide conditions cut down visibility to only 20 feet.

Ten members are still waiting for suitable weather conditions to get down to Deal Island. At time of writing, apparently 2 trips have been cancelled and a third is scheduled for mid July. --- Meanwhile we hear that a certain organiser has the 9 deposits invested at 9 $\frac{1}{2}$ % interest. --- Who said there was nothing to gain about running dive trips!

We don't have too many brothers or sisters in this club, but one pair of brothers have a mother who is doing long term historical research on some 300 odd convicts who were the first to settle the colony of Port Phillip in 1803. Our members mother was quoted in the paper recently as saying "For the past 25 years I have lived with 307 unliberated men".

---That might explain some of the antics of our two brotherly members who often refer to each other as "useless bastards"!

Being caught in the grip of Melbourne's winter I must rush off to warm my wetsuit for tomorrow's dive.

BARBY WHIRE
(The Fencer's Daughter)

DECOMPRESSION SICKNESS THEN AND NOW By Chas. V. Brown M.D.

In 1670 a certain snake couldn't see too well. It was in Robert Boyle's new vacuum chamber, and had a bubble in its eye. The significance of that bubble for compressed air divers was lost, since there weren't any in 1670. Later, when there were, who would remember a snake? More than two centuries passed before Paul Bert

established the role of the bubble and Boyle's law in decompression sickness.

It didn't help. Early this century compressed air jobs were increasing, but workers were falling like flies before a flit gun. English admiralty commissioned Professor Haldane to sort things out.

The amount of Nitrogen dissolved in the body is determined by its pressure in the breathing gas, and by the capacity of each kind of tissue to hold it. The rate of in-gassing through the lungs depends on the driving force for diffusion, which is simply the difference between the nitrogen pressure in the breathing gas and in the blood. The rate at which different tissues pick up the nitrogen however, depends on their blood supply. Thus tissues with good circulation (muscle, brain) saturate quickly, while those with poor circulation (cartilage, fat) saturate slowly. All this means that nitrogen uptake is proportional to both depth and time, that different tissues saturate at different rates, and that in time full body saturation will be reached for any given depth. Reverse the situation by returning to the surface, and the excess nitrogen wants to pop out of solution. It won't necessarily wait till it gets back to the lungs, and that means bubbles.

Haldane knew or deduced all this, but had no figures for the critical depths, times, and rates, so he had to experiment. The nearest thing he could find to people which didn't cost as much was goats, so a lot of goats became divers. It turned out that goats saturated beyond a certain depth always got bent (decompression sickness or DS) upon surfacing, while those saturated at lesser depths did not. Haldane knew about saturation, and it seemed the obvious answer. Pour a glass of 7-Up and watch till it stops bubbling, then stir it and lo - a new shower of bubbles. You weren't looking at equilibrium but at saturation.

Haldane studied his figures and concluded that a diver rapidly surfacing could tolerate a burden of nitrogen double what his body usually carried at the surface. Thus was born the concept of the safe 2:1 supersaturation ratio, the basis for the world's first useful dive tables and, empirically modified, for the U.S. Navy and nearly all other tables presently used today.

The dive table simplified life considerably. A working diver could ascend rapidly to about half his absolute depth, wait for some nitrogen to diffuse out, then nurse himself up by stages, watching

the magic ratio. A sport diver had only to avoid the no-decompression limits. DS was no more a mystery, merely physics in action.

But perplexing questions kept arising. Why should a diver get bent and not his buddy? Why today when not on the same dive last week? How come frequent diving first increases the bends risk, then lowers it? Why do some bends victims recover promptly upon recompression while others don't? Who repealed Boyle's law?

Many concerned scientists have tackled these questions, and some of the answers are in. The big news is that apparently all of us bubble after some (all?) dives. Gadgets called Doppler meters confirm it. The body is like the glass of 7-Up being stirred. After a safe 60 minutes at 60 feet, for example, what we tolerate is not so much a certain supersaturation ratio as a silent bubble load.

Bubbles arise in veins before arteries, not surprising since venous blood has picked up nitrogen from the tissues, while arterial blood has lost some to the lungs, besides being under higher hydrostatic pressure. Venous blood goes to the right heart, then the lungs where the pulmonary capillary bed makes a fine bubble trap. It filters them out and holds them till their gas diffuses out through the alveoli. The diver feels nothing till nearly half his lung capillaries are blocked; then comes discomfort, shortness of breath, and coughing-the "chokes". In time, the increased back pressure against the right ventricle can cause heart failure and shock.

If some bubbles are forced through the lung capillaries (or get through shunts or septal defects), they go to the left heart and are pumped out as arterial gas emboli. Surface tension keeps them semi-rigid, so they end up blocking arterioles and capillary beds. Here's where pure chance comes in. For a few bubbles to cause serious damage, they have to hit some important area like brain, cochlea, or heart muscle. Most bubbles end up in skeletal muscle or in large organs like the liver, and the diver feels nothing. Heavy bubble loads hitting such non-critical tissues nonetheless cause cellular damage which is probably behind the extreme fatigue which some divers experience after deep dives.

Bubbles forming in tissues other than blood may break into the blood stream or remain and mess up things locally. "Slow" tissues and injured areas are thought to bubble easily because their poor circulation doesn't cart nitrogen away fast enough. Fatty areas bubble still more easily because fat holds five times as much nitrogen as water. The pain of limb bends may reflect a growing bubble in a

tendon, ligament, or periosteum.

The most fascinating chapter of bubble lore today concerns their biochemical behaviour. The body somehow recognises the bubble as a foreign invader and counterattacks. A protein called fibrin coats the bubble surface. Platelets adhere to this and become sticky. Such bubbles, still in the veins, are then capable of sticking to and blocking venules and capillaries if pushed into them by a brief backward venous flow. Most spinal hits occur in this manner.

Platelets adhering to bubbles become activated and release or induce a whole witch's brew of potent agents. These unfortunately can do more harm to the diver than the bubble alone would do. What happens is complex, but the end result in severe cases is a shrunken blood volume, and vessels clogged with various sorts of emboli including platelets, clots, fat, detached capillary cells, and sludged red cells, as well as the original bubbles. The patient is in shock and requires more treatment than just recompression.

With this background, we're ready to challenge some myths: The dive tables are not sacred; they work fine for ordinary diving, but can't always handle special situations. Certain super slow tissues in the body doesn't desaturate in the 12 hours the tables say they should, so with frequent diving, these load up and put you into a repetitive dive situation when you think you're clean. On the other hand, a week or two of frequent diving confers some protection against bends, possibly because blood clotting elements have been depleted a little at a time by silent bubbles, or maybe because gas micronuclei (essential precursors for bubble formation) have been used up faster than replaced. The 33 foot no-decompression limit may fail - working dives to 25 feet or less have caused bends. Exercise or slow breathing underwater elevates your CO₂ which then flows into any bubbles, enlarging them beyond what the tables would assume. Under such conditions, a pause to rest and an ascent rate of 30ft/min. is safer than the specified 60ft/min.

And there's no way the tables can account for your illness, hangover, drug use, fatigue etc. - things that strongly predispose to decompression sickness. Some examples will illustrate: A young man got up at 3am drove 2 hours to the pier, vomited 2 hours on the boat, and passed out in the water after surfacing from a "safe" dive. Another died of massive bubbling when he dived soon after a minor operation, with medication. An instructor took her class out although she felt ill, and the dive left her crippled with a spinal hit.

Finally, our new knowledge of bubbling casts suspicion on the very structure of the standard dive table, as used for decompression diving. The initial rapid ascent to the first decompression stop seems to guarantee that bubbles will form, thus imposing longer stops as one nears the surface, so they won't grow too much. Indeed tests show that making the initial stops deeper and longer permits faster progress near the surface, adding up to a shorter and safer overall ascent.

Our knowledge of decompression sickness has come a long way since the engineer who built the Brooklyn Bridge treated his bends with liberal applications of whiskey, inside and out, but full understanding is still a long way off. In the meantime, our best strategy for staying healthy can be summed up in two words. Dive conservatively.

Submitted by - FRED FERRANTE