Provisional Report on the 1974 Diving Deaths

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Overview

The remarkably low number of fatal incidents that occurred in 1974 in association with underwater activities, eight in number, points to the paradox that in so patently hostile an environment so few come to serious harm. These brief case histories are presented to drew attention to the fact that failure to apply the commonly accepted rules for safe diving carries with it the occasional exaction of the supreme penalty, not withstanding the undoubted fact that a large number of divers survive the making of similar liberties with their underwater environment. Every mode of civil diving practice save deep sea professional diving has been represented this year and there are present indications that this group is in active hazard from the slowly developing crippling arthritis associated with dysbaric osteonecrosis.

The significant avoidable factors associated with these deaths are the same as those demonstrated in previous surveys. They are none the less tragic because others have trod the same paths to oblivion.

In brief, there were three breath-hold divers, two scuba divers and three hose supply divers (Hookah type). Causes involved included under-respect for the power of the sea, hyperventilation blackout, total ignorance of scuba apparatus used, the cutting of an air hose and failure to realise that deep sink-hole diving requires treating with great respect, for there are the risks of depth (narcosis) added to risk of being unable to ascend directly to the surface, entanglement, loss of visibility, etc.

Brief Histories

To ensure maintenance of confidentiality in this small series these reports include nothing not already of public knowledge. However, there is much to be learnt from a closer look at the events than is usually afforded to newspaper items.

Case 1 - (Breath-hold) The 22 year old victim tossed a coin to decide whether or not to call off the dive. Unfortunately for him the decision was made to chance the elements and make the dive. There was an 8-10 ft swell and visibility was poor underwater, but he was keen to do some spearfishing and managed to convince his buddy that he was sufficiently experienced for the conditions. They arranged that he should enter the water first and wait outside the surfline, and this plan was followed. When the buddy arrived at the appointed area he was unable to see any sign of the first diver so, after making a short search, he returned to the beach. After a fruitless search across the waves and along the shore he alerted the rescue services. They too could find no trace of the missing man. In fact the body was not recovered for six days. The victim was found to have bean wearing a home-made weight belt whose release mechanism was difficult to operate, a factor that would disadvantage him when seeking to alleviate his buoyancy problem in the rough water. His inexperience made him less able to extricate himself from water conditions he had mistakenly risked. It is well known that anyone in trouble in water becomes incapable of rational thought under the imperative desire to maintain their head above water. The disturbed, rapid, inefficient, shallow breathing reduces the buoyancy and increases panic. The possession of an efficient buoyancy aid could have been lifesaving despite all the other adverse circumstances.

Case 2 - (Breath-hold) This spearfisherman had a good reputation for his ability in the sport. He had ten years experience, though this was said to be the first time that he had worn a wet suit and a weight belt. He is known to have speared a 45lb Kingfish at 30 ft depth and kept with it when it fought hard. A fellow spearfisher saw the victim's gun, and the attached fish, on the sea floor a short time after the kill. Then he observed the victim about 15 ft away from the gun, slowly sinking into a 50 ft trench. He was unfortunately unable to breath-hold dive sufficiently deep to reach the body so swam to summon help. Another diver was able to reach the body but was unable to raise it even after releasing the weight belt, having to procure a hookah hose before effecting the recovery. Naturally, by this time all hope of successful resuscitation had passed. This witnessed death was typical of the hyperventilation-blackout syndrome; a good diver over-extending himself in fighting a vigorous fish and then drifting gently to the sea floor, unconscious. Survival from such a circumstance is entirely dependent on the event being witnessed by someone immediately able to dive to the required depth, raise the body and perform effective resuscitation. Such factors did not operate here. The better the breath-hold spearfisher the greater the need for such a buddy.

Case 3 - (Breath-hold) This spearfisherman and his friend had received some training in Skin and Scuba diving early in 1973. He was said to be competent both as a swimmer and as a diver and to be aware of the dangers of pre-dive hyperventilation, though he still practiced it. On this occasion they were spearfishing about 20 ft from the rocks at the sea's edge, the water being calm. The friend left the water with his third fish and became involved in conversation with two passers-by who were intending to go swimming in that area. One of these witnesses saw the victim at this time swimming normally on the surface. A short time later one of the men entered the water to examine a red float a little offshore. He was wearing goggles and the water was clear so he was able to see, to his great surprise, a diver lying quietly on his back on the sea floor in about 15-18 ft of water. A speargun was lying nearby and the facemask was still in position. After shouting the alarm to those ashore he dived and released the victim's weight belt, thus enabling him to surface the body. Together with the help of the other swimmer, he brought the body ashore, chest compression resuscitation being performed, without success, both in the water and after landing. The period of submersion was very possibly too long for success to be expected but EAR might have been a better choice of method. This quiet death in calm water could also be a hyperventilation blackout. Once again, dive alone, die alone; ... and possibly unnecessarily.

There were two addenda to this story. First, one of those present was said to be a diving instructor yet he did not attempt EAR. Second, a surviving fragment of the onshore conversation taking place as the diver died: one of the strangers said, on seeing the size of the speared fish, "Why don't you give it a chance to grow?" The reply made was "They are getting smaller all the time".

Case 4 - (Scuba) The circumstances of this tragedy are almost unbelievable and it is hoped they will never be repeated. The victim was making an inspection of a submerged outlet valve in a shallow freshwater dam. He tried to do this by breath-hold diving but found it too difficult so thought to use scuba apparatus. It was no part of his duty, it would seem, to be a diver and in fact he was totally ignorant of diving. He borrowed a wetsuit and weight belt from someone and then approached a neighbour for the loan of a scuba tank and demand valve, refusing the offer of flippers because be intended to both enter and leave the water by walking. The owner of the equipment was aware of the total inexperience of the victim so showed him how to turn the air on and how to breath

using the mouthpiece. There was no quick-release on the tank harness. Being not a fully equipped diver, he returned to the dam and his first ever dive.

At the dam he dressed and entered the water, there being handed a couple of loose spanners. He told his companion it would be only a short dive as he didn't have much air. The companion then rowed away on another job, losing sight of the diver. When he returned at the agreed time and was not met by his friend he searched for the air bubbles. Something in their character alarmed him so he made some breath-hold dives but was unable to locate him in the conditions of nil-visibility that always existed in the dam water. Being by now highly anxious for the safety of his fellow worker, he rowed ashore and called the Police. But by now the flow of bubbles had ceased.

The body was recovered by a brave policeman making breath-bold dives. The depth was 20 ft, the water cold and opaque and the victim dead when reached. When found he was noted to have his hands and forearms tied together by a line also attached to the two spanners. This line had apparently been on the underwater valve from a previous occasion and removed by the victim for use to prevent the possible loss of the spanners. The light nature of the line had done the rest, allowing it to float freely but uncontrollably around him. His mask was dislodged to behind his head and he had lost the mouthpiece of the demand valve. Not only was the tank harness without a quick-release, the weight belt was too long and he had the buckle to one side, so it would be difficult to reach even had he been experienced and had his hands free. The muddy bottom of the dam sloped such that a crawling escape to safety was impossible through slipperyness. He was alone, without air, his arms tied and without a lifeline to guide a rescuer. Even Houdini could not have escaped such a combination of self-inflicted circumstances.

Case 5 - (Scuba) This deep dive at Mount Gambier received the publicity usual to all such deaths. The circumstances of the dive were probably not unlike those associated with many dives with uneventful outcome, if one may judge from other incidents on file.

The two divers involved, of whom one died, were apparently experienced in scuba diving in the sea but their experience of deep diving and of cave/sink-hole diving is presumed to be slight. In this they were possibly typical of the majority of casual divers in these inland waters. There is some element of conjecture in the story of what occurred, no actual Inquest being held. The Coroner was content to accept the statements made to the Police in their investigation as adequate basis for a finding of death by misadventure. Such a procedure was his prerogative and completely proper but leaves some points relating to the incident undocumented.

In essence, this death occurred because the dive plan left no margin for safety there was no air-time to spare and no allowance for possible problems of nitrogen narcosis. Thus were the seeds of disaster sown.

The dive was to 200 ft using single 72 cft cylinders plus one reserve cylinder hung at 30 ft. A 220 ft long shot line was used and the victim wore a reel line on his belt. This was to be a bounce dive and in fact the ascent was started after only 20-30 seconds at maximum depth. Both the shot end reel lines were attached to the surface buoy. Before leaving the 200 ft level the second diver switched on his reserve. Ascent was uneventful and hand contact was maintained till 150 ft depth. Here, where the light could be seen above, the diver wearing the reel found his ascent suddenly arrested. His companion was by now low on

air end having difficulty in breathing and this may have similarly affected the victim as their rate of air consumption was usually similar. The buddy assumed that a line had snagged so tried to pull him free. When this failed he never thought to try to cut the line, shortage of air requiring him to ascend to the waiting air reserve, there to decompress. At this time thought of the need to avoid decompression sickness over-rode all other considerations. When decompression steps were completed, be surfaced and gave the alarm. It seems reasonable to assume that his failure to rethink his assistance pattern when the tugging failed was an example of the narrowing of perception, or "tunnel thought", with obsessive concentration on one fact to the exclusion of all others. This would be typical of nitrogen narcosis and increased by the panic stimulus of air shortage. Had the line in fact come free this incident would have been soon forgotten by both those involved. Had more air been available the victim might have cut himself free.

Case 6 - (Hookah) The fatal and unexpected Shark attack on this Abalone diver could not have been foreseen or prevented. It is presumed that a white pointer mistook him for a seal, for he was gathering abalone from the sea floor with his legs floating upwards when the attack occurred. The first that the man in the boat knew about it was when the diver surfaced unexpectedly and called for help. Until he had pulled him back to the boat and was attempting to get him aboard he did not see the shark or realise that an injury had occurred. At this time the victim still lived but death from shock and haemorrhage occurred before shore was reached. There is no note that any attempt was made to give first aid but most of the blood loss may have occurred while still in the water, so not preventable. Seals had been seen in the area previously, though not at the time of the attack. That the risk of attack is low may be gauged from the rapidity with which the vacant fishing licence was applied for and taken up.

Case 7 - (Hookah) There were two divers here on separate hoses from an air compressor in the boat. The owner of the boat and the equipment became the victim, though the only experienced person present. He had bought the equipment new about two years previously and kept it in good condition. Though by this time practiced in its use he may never have received any formal diving training. The other diver was totally inexperienced save for a quick lesson in a pool in the use of hookah apparatus, while the friend left in the boat was a non-diver who was without prior experience with the compressor. The two did not keep together underwater, the novice making the valid point that as the other had a speargun he intended to keep out of the way. Water conditions were good and depth 20 ft.

After a few minutes the victim surfaced, shouted, sank and then resurfaced. The man in the boat correctly interpreted this as a call for help and used the hose to pull him back to the boat. He was apparently conscious till within 8-10 ft of the boat. By this time the other diver had come across the speargun and one flipper on the sea bed and surfaced with them. When he observed what was occurring he dropped his find and went to give assistance. Finding it impossible to get the victim into the boat by pushing from the water while the other tried to lift, he came aboard and together they managed to bring the body inboard. In both this and the previous case great difficulty was experienced in getting a helpless diver back into a boat. It was noted that the victim's demand valve was then functioning normally and the novice at no time had any air supply problem. The total dive time was only 8 minutes. EAR was given but the victim was already dead. Air Embolism was the cause of death but why the diver made an emergency ascent is quite inexplicable. He was certainly aware of the need for exhaling on ascent, having instructed the novice to this effect. Once again, the extreme

ease with which one can use hookah apparatus without training has been illustrated, as also the mode of death (air embolism so typical of fatalities in this diving group and the rapidity with which it can occur).

Case 8 - (Hose supply) Neglect of precautions is possibly inevitable when undertaking routine procedures. Only the occurrence of the inevitable accident brings a return of a more alert appreciation of the value of correct routines. Such was here the case. This was a normal harbour job of removing a broken pile. The surface barge was required to move slightly and the order given. Unfortunately on this occasion the diver had obtained an excessive length of free hose from his surface tender and it had drifted, unsuspected, under the barge. When the propeller started to revolve it immediately tightened the hose around itself. This not only cut off the diver's air, it also violently jerked him. He was thus in no condition to close his inlet valve to retain his air. It is easy to note the faults in hose management, the risks of unprotected propellers and the incorrectness of having a revolving propeller with a diver in the water nearby. The sins were venal, the penalty mortal. This case is reported in the hope that it will alert others to consider their diving practices.

Discussion

These cases illustrate once again the extremely short span of time it requires for death to occur. None of these victim did anything that others may not have done without a fatal outcome, yet all save the shark victim broke clearly recognised guidelines for safe diving. The reader is urged to consider his own diving practices to see whether, should he too prove mortal, others would say of him "What an unnecessary thing it was that led to him dying'.

The breath-hold divers continue to hyperventilate and few inevitably black-out. In the absence of rapid rescue and resuscitation they will drown. Those most at risk are the spearfishermen seeking to excel. The inexperienced divers under-respect the sea's power and risk simple drowning. That so few in fact do drown may be a tribute to the buoyancy given by a wet suit, though there is no proof of this.

That Scuba divers require training is now generally accepted, and Case 4 shows the possible consequences of lending equipment to the untrained. The lender in this case obviously is ignorant of every principle of safe scuba diving. Case 5 illustrates the trueism that still waters and deep lead men to folly. Once again, it is clear that every dive plan should include a very generous element of safety. To have air available is a great comfort in time of trouble. Perhaps if tank fills were charged by quantity actually supplied rather than by tank size divers would not mind returning from a dive with air remaining unused. It is time that those intending to dive in sink-holes/caves ensure that at least the dive leader is alert to the special risks end precautions of this type of diving and adjust their dive plan accordingly. To dive deep without adequate air and without allowance for nitrogen narcosis is suicidal.

One should remember always that the diver without a line may get lost, one with a line get snagged. The only ready remedy to the deep-dive menace would seem to be if some public spirited person put a notice on the shaft wall saying "200 ft; please sign here" ... at 100 ft.

Hookah diving is another diving discipline that merits special attention from diving instructors, despite the absurd simplicity of the equipment, for the only

thing that goes seriously wrong for the diver is the abrupt cessation of his air supply. But this little matter explains the relationship of air embolism with hookah diving fatalities.

It is apparent that a thorough knowledge of the first aid treatment of Haemorrhage and of Resuscitation may be required at short notice. It should therefore be a required skill.

It is the writer's opinion that role of the Coroner in making verbal examination of witnesses, based on their statements to the investigating police, fulfils an important need. He can often elucidate points left unclear in statements and obtain information not thought significant to the basic investigation as to whether the death was misadventure or culpable, but of importance and basic to consideration of the preventable factors present in the incident's evolution. The Coroner has a key position in the Safety Team. He can also, where necessary, prevent ill-formed "Experts" from having it all their own way, a difficult, skilled and important task. The holding of inquests is as relevant to today's problem as it was to those of times long past when the Office was initiated. Nothing better has yet evolved for the investigation of the generality of accidental deaths. This investigation certainly rests heavily on the work of Coroners.

Acknowledgments

All those who have supplied information are thanked. Special thanks are given to the Attorney General's Departments in all States for their continued assist.

Request for Incident Reports

Without a continued supply of information concerning incidents associated with diving there cannot be progress in further improving the safety of diving, for dangers will remain unrecognised and uncorrected. Although this report concentrates on fatalities, reports of all types of non-fatal incidents are equally required. All are treated as confidential. YOUR reports could help improve the safety of future divers. Please send reports, or queries, to the following address:

Dr DG Walker
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NARRABEEN NSW 2101

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