FREE ASCENTS: A VIEW FROM THE SCOTTISH SUB-AQUA CLUB

Professor ASG Curtis
President, Scottish Sub-Aqua Club

I have been asked by Dr D Walker to write a defence of the practice of free ascents in the training used by the Scottish Sub-Aqua Club.

Speaking purely personally for a paragraph, I would remark that I have been surprised at the intense and righteous disapproval that some people have evinced on hearing about our use of free ascents. It seems to me that as soon as we have a perfect knowledge about how we should dive and train it will be time to start throwing stones at those who are clearly amongst the imperfect. We are not at that happy state yet and the SSAC regards its present practices as the best it knows, but is quite aware that in the future both the accumulation of evidence and of thought is bound to alter at least some if not all of our training. Thus the views expressed in this article represent the present and the historical position but cannot be held to be a statement of what we may do in the future.

First, what do we do? SSAC training and testing is not greatly different from CMAS or even from BSAC training. The stages which a trainee should pass through are Snorkel Diver, 3rd Class Diver, 2nd Class Diver, and then onwards to 1st Class Diver and/ or a variety of instructional qualifications. During the open water tests for the 2nd Class award the trainee, who by now will have at least twenty and probably more than thirty open water dives to his or her credit, is asked to complete, after appropriate training, a test in which a slow (1 metre per 3 seconds) free ascent in a non-buoyant state from 6 or 7 metres depth to the surface is performed.

Why do we do it? Basically for three reasons:

1. Free ascent situations will occur, however careful we are about matters like equipment servicing, dive planning, and avoidance of situations which might lead to free ascent. After all, a great deal of training is directed towards situations which never ought to happen, eg. rescuing someone else. In recent years, as well as earlier, at least 16 incidents per 10,000 dives have occurred in the SSAC in which such events as equipment failure, air supply exhaustion, rescue of panicking divers, and very occasionally unforeseen difficulties in handling potentially buoyant articles on wrecks, etc. have led to the necessity of making free ascents. Similar incidents have occurred in other clubs.

2. Our training philosophy is that training is mainly towards meeting potential emergencies and that it should be practical rather than purely theoretical. In other words it is better to have some practical experience of one’s ability to cope with a potential emergency situation (simulated in training) rather than a purely theoretical knowledge, as this gives greater insight and confidence as well as proven ability: provided that the risk in training is appreciably smaller than the risk in not being practically trained. We should also look at the likelihood of a situation arising and thus determine whether the training should be given to every diver or only to those who have both more experience and more probability of carrying out a large number of dives and thus of encountering the situation. We also need to analyse each situation and the appropriate response(s) and consider at what point, taking into account other practical and theoretical knowledge required, should the training be introduced.

3. At this point we enter an area where information is partially lacking. Nevertheless it is clear that practicing free ascents as we do it (see below) must have a fairly small risk. The Scottish Sub-Aqua Club has now completed more than 2800 free ascents without incident since the practice was re-introduced. It can be argued that perhaps a very small amount of barotrauma might have been detectable shortly after the ascents but there is no evidence from which to suppose that this was so.

The Club is in the process of introducing a regular requirement for repeat medical examinations for divers and those, admittedly few, divers who have been re-examined after undertaking free ascents have shown sign of lung damage.

Are free ascent accidents more frequent in those clubs that ban their practice? We do not know as yet, but we do know that incidents requiring free ascent do occur during dives. Evidence on the incidence of various types of accident in the SSAC is set out in Table 1. The data for this table was collected in a recent survey.

Basically, the table tells us that air failure is a far commoner incident than decompression sickness, or hypothermia, or unexpected sickness unconnected with diving, manifesting itself during a dive.

It is worth looking at the events and arguments that led the RN to suggest that free ascent training should be banned. In the late 60's and early 70's RN had a small number of cases of fatal barotrauma during submarine escape training, mainly amongst the trainees. The training requires the use of a very fast highly buoyant ascent with speed of 2 metres per second or faster with buoyancy in excess of 10 kilograms. Clearly these very fast ascents do have a relatively high risk of barotrauma, perhaps particularly amongst those who have little or no previous experience of being underwater. It can be pointed out that the nearest equivalent situation for the amateur diver arises either during ABLJ training, in which mismanagement can lead to highly buoyant ascents, or when weight belts are lost, particularly by those who have inflated dry suits or who carry a great deal of weight. If free ascent poses a great risk to the amateur diver we should perhaps consider banning ABLJ training or the use of inflatable dry suits.

Surprisingly the RN does not have appeared to have carried out any detailed research into the incidence of free ascent barotrauma amongst amateur divers in arriving at its recommendations and may not have been aware of the type of training that was in fact being used. In the SSAC the emphasis is first that would-be divers should receive whole plate X-ray examination to ensure that they are free from bullae. When practical training starts the trainee starts working on a shot line with great care being taken to ensure that he or she is very close to neutral buoyancy. Initially the trainee is accustomed to use a shot line for ascent, finning to ascend. Then the trainee works on the line ascending with his mouthpiece out, but close to hand should the need for it be felt, breathing out and with an instructor by his side. When free ascents can be done from 6-7 metres at the correct speed on the shot line, the trainee then repeats this free from the shot. Free ascents from depths in excess of 7 metres do not form part of SSAC training.

Thus though we recognise that free ascent does carry some potential risk there is a very low risk of consequent barotrauma, so low that in fact it has not been seen in SSAC. All training and diving procedures carry a measure of risk: for instance there have been at least three cases of incipient drowning in pool during SSAC training, happily obviated by watchful and knowledgeable instructors. But it is clear that the incidence of the need to carry out free ascents is very much higher, however avoidable they might have been in a more perfect world. However the SSAC regards

free ascent as the solution of last remedy to an air supply failure, which should be solved by preferably making use of a companion's octopus rig, then by breathing from an ABLJ, then by a shared ascent and, as a last resort, by free ascent.

The evidence we have allows us to answer two of the three important questions which follow, and which sum up the whole question.

Do situations leading to free ascent occur with sufficient frequency to require training for this form of ascent? An incidence of one free ascent per 243 dives (about 6 years diving for the average SSAC member) suggests to us that since free ascent is the fifth most common diving incident it is well worth training for it, provided that the answer to the next question is suitable.

Is there an appreciable incidence of risk in free ascent training? The answer to this is that since no incident has occurred during the 2800-odd training ascents it must probably be a very low risk.

At this point all we can conclude is that there is little risk in free ascent training and that it trains for a fairly frequent incident. However it might be the case that trained divers who have not received free ascent training also cope just as well with free ascents as those who are trained, so we need to ask: Is there appreciable risk in not being trained for free ascent?

The SSAC cannot answer this, but we await data from other clubs which do not carry out free ascent training with interest. It should be remembered that the reasons which lead a particular diver to choose to carry out a free ascent may represent failure of reasonable maintenance of equipment, pre- or in-dive checks, misjudgement of situations and incorrect thought at the moment of accident, all of which can be reduced in incidence by better training, but that it is impossible to eliminate such human failings entirely. We plan to carry out a larger, more thorough survey amongst our members to discover if the frequency of free ascent is related to duration of experience, and whether it is commoner in our earlier trainees than in our most recent trainees.

PROJECT SEAFARER RATED SAFE

Since its conception, Project Seafarer, the huge underground antenna grid system proposed by the US Navy for communicating with submarines, has been controversial. President Carter considers Seafarer to be essential to national security. Other persons fear that the extremely low-frequency radio waves to be used could cause biological damage to people (specifically, increased serum triglyceride levels), orientative and navigational problems for birds, and behaviourable difficulties for fishes.

A National Academy of Sciences (NAS) committee has now evaluated preliminary studies of potential effects and has concluded that it is "very unlikely" that people living near the Seafarer system, if it is constructed, would be adversely affected by it. The committee did recommend, however, long-term studies of certain biological-ecological aspects to obtain more definitive information.

(Reproduced from Sea Secrets,
a publication of the International Oceanographic Foundation
(vol 21, 1977), to whom our thanks are due.)

TABLE 1

SURVEY ON FREQUENCY OF VARIOUS TYPES OF DIVING INCIDENT

Sample: SSAC members. 4868 dives, representing 148 years of diving experience.

SHARED ASCENTS	1 incident per	173.8 dives
RESCUE OF DIVER STARTING UNDERWATER (including ascents in which rescuee did not use own main air supply)	1 incident per	187.0 dives
RESCUE OF DIVER STARTING ON SURFACE	1 incident per	202.0 dives
FAILURE OF AIR SUPPLY	1 incident per	206.7 dives
FREE ASCENTS	1 incident per	243.4 dives
CONTAMINATED AIR SUPPLY	1 incident per	270.2 dives
ABLJ ASCENT USED	1 incident per	486.8 dives
OCTOPUS ASCENT USED	1 incident per	486.8 dives
HYPOTHERMIA	1 incident per	811.3 dives
ILLNESS NOT CAUSED BY DIVING BUT MANIFESTING ITSELF UNEXPECTEDLY DURING DIVE	1 incident per	2434.0 dives
DECOMPRESSION SICKNESS (Not based on sample but on whole club data)	1 incident per	170,000* dives

* Data rounded to nearest 000.

Note that data under some categories may appear also in other categories. For example failure of air supply was the main, but not the only, cause of shared, free and other ascents, contaminated air supply being the other main reason for shared, free and other ascents.

DROWNING, A CASE OF “LOCAL RULES”

Maoris have claimed a curse, in retribution for damage done to sacred places, was responsible for the drowning of eight people off the Waikato coast of New Zealand recently. A local leader said “The drownings will continue as long as the land (in which a friendly water spirit, a Taniwha, lives) is in other hands”. Another Maori leader points out that no Maori had ever been drowned in the area. The curse was imposed last year and since then the local council and building contractors have had a series of mishaps while trying to build on the disputed land.

Australian, 13 January 1978