Thoughts on mountain safety, mainly in the light of the Feith Buidhe disaster

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The Feith Buidhe Disaster and the subsequent Public Inquiry should have had a deep and lasting effect on the thinking of those concerned with taking parties of youngsters into our Scottish hills, particularly the Cairngorms. In the past decade, we have carried the bodies of nine teenagers from the Cairngorms, and at least ten others have been saved, some of them unconscious when found: all of them literally at death's door. Dozens of others have been very lucky in that the weather remained clement until they were rescued or reached shelter.

It has been obvious for years that a major disaster was bound to take place. The Ainslie Park School expedition was no worse than many others, and indeed the children were better equipped than most. What is not commonly realised is that this expedition was fortunate in that only six lives were lost; it could so easily have been more than double that number, as the other half of the party also was only a hair's breadth from catastrophe when they were descending the March Burn on ropes and struggling through the deep snow in the Lairig Ghru.

There is nothing new to be learned from the Feith Buidhe Disaster, and there is nothing in the following article which has not been known to experienced hill men for generations. Nevertheless, if the reiteration of known truths can save anyone grief, either as a parent or as a leader, then it will be more than justified.

In mountaineering, as in any other situation, there is no such thing as absolute safety, and different people find that different levels of risk are acceptable to them. It may be that an adult, confident in his strength, feels able to challenge nature, and he may derive personal satisfaction from deliberately taking risks. While one may not agree, one must admit that each individual is entitled to his own opinion. However, this must be at all times a personal decision, and no one has any right to impose deliberate risk on others. This is relevant to anyone who has charge of a party less experienced than himself, but above all it is mandatory for those in charge of parties of young people. Adults make a reasoned and personal decision to go to the hills, and implicitly accept some risk, but children who are being taken hill walking, perhaps as part of their education, have not made any such decision,

and therefore the degree of risk acceptable in their case is very low indeed. A 'press on' or 'do or die' attitude is inexcusable. It is extremely important to realise that only relevant experience allied with good judgment will enable anyone to properly assess the potential risk of any proposed expedition, and that there is no fast way of gaining experience.

There are many tools, techniques, and items of equipment designed to help us survive in adverse circumstances, but it should never be forgotten that man, although physically a puny and defenceless creature, has survived because he has used his brain instead of what little brute strength he has at his disposal. If we are to survive in any difficult situation, it is crucial that we use our brain to avoid hazards we may be unable to cope with physically. 'Survival' is nowadays a popular subject for discussion, and in this context, the fable of the oak tree and the sapling is particularly apt. True survival consists of avoiding uncontrollable situations, not of trying to live through them.

The foundation for most accidents (including getting lost, exposure and so on) is laid before the party leaves base. The most common basic causes are over ambition; lack of appreciation of weather conditions; insufficient navigational skill, and lack of foresight. I do not include poor equipment. Accidents attributed to this are usually caused by someone putting equipment to a use for which it was never intended, such as trying to rock climb with smooth soled shoes, or trying to carry out serious navigation with an inappropriate map or a compass from a Xmas cracker. The only bad equipment is equipment which is not functional, for example, waterproofs which do not keep the wearer dry, or ice axes which break too readily.

Of all planning faults, over ambition is the most dangerous. An expedition should be what one is capable of doing, not what one would like to be capable of doing, and there is often a vast gulf between the former and the latter. There is no pleasure, only danger, in tackling something beyond one's capabilities. By all means use Naismith's Rule,* but it should be modified to suit the user. The only sensible thing to do is to gradually increase the length of walks, so that one knows how far one can walk and climb in comfort carrying a certain load. If any of the components (load, distance, height climbed) are increased, then the others should be reduced accordingly. Load should always be kept to a minimum, as heavy loads are excessively tiring. Other factors apply, such as the type of terrain, and, very important, weather

* One hour for every three miles of distance plus half an hour for every 1,000 feet of climbing.

and snow cover. Deep soft snow can easily reduce speed to 1 mile per hour, and with a head wind, progress may be impossible. The effect of all these different variables can be learned only from experience, never from books.

Over ambition is often followed by false pride, preventing the party concerned from modifying the route or turning back. This is especially a danger on a walk from one point to another, where transport has been arranged for the return journey, or where accommodation has been booked. Never be afraid to modify a route or turn back.

Lack of appreciation of weather conditions has caused many fatalities, especially in the Cairngorms. It should be borne in mind that Scotland is as far north as southern Alaska, and that the weather conditions on the high tops (over about 3,000 feet) are equivalent to those experienced north of the Arctic Circle. The weather, and especially the wind, can be a relentless and fearsome enemy, seeking out all the weak points in protective clothing. Wind multiplies the chilling effect of cold on the body, and a wind of only 15 miles per hour at 30° Fahrenheit, or 2° of frost, is equivalent in chilling effect to still air at −38° Fahrenheit, or 70° of frost.

A sudden winter storm is one of the most serious things which can overtake a traveller in the Cairngorms, and if overtaken by one, the most sensible thing to do is to lose height and find sheltered ground, travelling with the wind on one's back, where it will assist instead of impeding progress. Both wind and cold increase with altitude, so always allow for the fact that a breeze with cold rain in the valley may well be a gale driven blizzard at 4,000 feet, during any month of the year.

Before setting off, always try to get a weather forecast from one of the offices listed in the front of the Telephone Directory. A general forecast may be inaccurate for the hills, so tell the forecaster where you are going. The information required is wind speed, direction and trend, freezing level, cloud cover, precipitation and outlook.

Insufficient navigational skill, or merely the lack of navigational instruments, is also a frequently recurring cause of mishap. Nothing much need be said regarding this, except that 'sufficient navigational skill' is a variable quantity, depending entirely on conditions. On a fine summer's day it may be sufficient merely to be able to read a map. In a white-out, an error of a few yards on a compass bearing may end in death. It is therefore again important to realise one's own limitations and to act within them.

Lack of foresight is allied to over ambition. It is failure to use the brain to best advantage. One should always consider the likely and the possible implications of any proposed action, and it is important always to keep open as many options as possible. Perhaps the most obvious example of this is the planning of bad weather variations on a route, and noting the presence of escape routes.

Before setting off, one should know where one is going to go for help, should the need arise on any particular part of the route. This usually entails knowing where the nearest telephones are.

Always be careful in coming down a convex slope on a strange mountain. From above, one can see the more gentle slopes, but if they are interspersed with crags, these will probably not be visible. In a situation of this sort, it is easy to become crag-fast, especially in failing light.

Party size is very important, and it is noticeable that the larger a party becomes, the more it assumes the characteristics of a flock of sheep, with everyone following whoever happens to be in front. In any party, regardless of size, it is important to keep a check on navigation, lest everyone thinks that someone else knows where they are going. This sounds ridiculous, but it can very easily happen, especially on 'known' ground.

A party of six or seven is the largest desirable size, even in summer. In winter, it is too big, the optimum being three or four. If the party is more than about six strong, it is very easy for someone to fall behind and not to be missed.

Where the party is of children accompanied by adults, then the ratio of adults to children is important. It is impossible to lay down hard and fast rules about this, as so much depends on the age, strength, and comparative experience of the children, but the ratio should in some cases be as low as one adult to two children. A party of about thirty children accompanied by one or two adults is very unwise, other than on a very sheltered and well-defined low-level route.

If a planned route involves fording a river or stream, be very careful. The force of water is extremely deceptive, and mountain streams can rise to spate levels in a very short time. If in any doubt about the safety of crossing a stream, do not hesitate to make a detour, and always use bridges when they are available.

The possibility of accident is ever present, although completely unavoidable accidents are very rare. It is essential in a case of accidental injury to make the victim as comfortable as possible, and, even more important, to make him feel that the situation is under control

and that he is going to be all right. Part of the danger of solitary expeditions is that an incapacitating injury is followed by the psychological shock of knowing that there is no one else to rely on and that no outside help is available.

When treating mountain accidents, it may well be impracticable to effect any positive remedial treatment, but remember that if you can prevent any deterioration in the patient's condition, you will have done well.

Always treat the most immediate danger first; for example, severe bleeding, stoppage of breathing or heart failure; and do not leave the patient at risk from dangers such as further falling, rock fall, avalanche, and so on. In an emergency, unorthodox methods may have to be used, and possibly un-sterilised material used for dressings; but remember that the saving of life comes first, and that secondary complications caused by infection and so on can be treated. The hospital will not thank you for a sterile corpse. In the words of the late George Mackenzie, 'If you encounter a massive wound with serious bleeding, and you have no dressing available, then if necessary, shove your bonnet in it. You *must* stop the bleeding'.

Someone should always stay with the patient, while others go for help. Before leaving, the patient should be protected from the weather as much as possible, and should have insulation between him and the ground. If his injuries permit, it will probably be advisable to move him a short distance to a more sheltered spot, which should be marked as conspicuously as possible, and the patient should not thereafter be moved. If it is unavoidable that he should be left alone, it should be impressed on him that he must not move, even if he feels better. Signalling apparatus should be left with the patient, and the exact map reference of the spot written down. Compass bearings from prominent points can also help greatly, provided the reference points are fairly close at hand.

Before anyone leaves to get help, each member of the party should know exactly what is planned, and the one going for help should have all relevant details written down, especially the map references. If two are going for help it is better for them to go together, rather than splitting up and making for two different places.

If the party consists of two, and one is injured, then a decision must be made whether to stay with the injured person or go for help. This will inevitably be difficult, and the condition of the patient will be an important factor, as it may not be advisable to leave him. Other factors affecting a decision are the remoteness of the area, the weather,

and the likelihood of being found. If the patient is unconscious or semi-conscious, or has severe head injuries, he should be tied to a belay so that he cannot wander off. In this case, it is even more important to clearly mark the spot. As a general rule, however, it is better to stay with a badly injured person and try to signal for help.

Benightment, or a similar situation in daytime, when one must stay put, can arise from a variety of causes, of which the most common is getting lost. In summer conditions, this is usually not serious, provided those concerned do not lose their heads, but it must be stressed that an emergency overnight bivouac in the mountains in winter is an extremely serious undertaking, the possibility of which must be avoided by good planning and foresight.

If however, the worst happens, and an enforced winter bivouac is necessary, there are certain things which should be done.

There must be no panic. This is the most immediate danger, but if one forces one's self to act deliberately, the urge to panic will slowly recede. First of all, the situation should be examined and a reasoned decision made. The most important thing is to get out of the wind, and the best way to do this may be to find a suitable spot and dig a snow hole. This, however, takes time, and without a shovel it is very difficult. If a snow hole is out of the question, one can still find shelter, possibly in the lee of a stream bank, or behind a large boulder. The ideal sort of situation is where one will become covered over by snow without being deeply buried. The most satisfactory place is a small sheltered corner in an otherwise exposed area. Avoid large hollows which are likely to accumulate considerable depths of snow. Remember that about 1 foot to 18 inches of snow provides tremendous insulation and complete protection from the wind. If plenty of rope is available, then a rope spread out over boulders can make a useful guide to a bivouac site, but otherwise rope is better utilised to sit on. One's chance of survival in adversity in severe conditions is dependent to a very large extent on one's mental attitude, and so a plan should be made to last through the night – a sandwich or a sweet or whatever is available, every so often, is a great morale booster, although in terms of physiology, it will probably not do very much good. It is important that a party should have a feeling of being all together, rather than being a collection of separate persons, and therefore I greatly favour the large type of emergency bivouac sack which will hold about six persons. In a sack such as this, each person encourages his neighbour, and it is possible to light a stove in the centre. There is however a danger of lack of ventilation which should be guarded against.

In an emergency, every effort should be made to utilise anything which will stop the body losing heat. All spare clothing should be put on, tight clothing and boots loosened, and the feet placed in a rucksack. If a rope is available, it should be used to sit on to prevent heat loss by conduction. Body surface area should be reduced as much as possible by adopting a crouched, foetal position, with the arms crossed inside the anorak or cagoule, and by huddling as close as possible to the others in the party. Never get out of a bivouac to urinate – use a mug or whatever else is available. One's life is much more important to one than hygiene or delicacy. In a difficult survival situation, all one's will-power must be concentrated on reaching the next milestone, whether it be the next sandwich or sweet, or merely the next time the minute hand on the watch reaches the hour. Have a definite goal, but live in the present, and meet each difficulty as it arrives, without worrying about all the dangers to be avoided. Most important of all – do not lose hope.

Exposure is a commonly misunderstood ailment, but has with good reason been called 'The Killer of the Unprepared'. It is the most dangerous malady which can afflict one on the hill, as it is insidious, and it affects the brain, so that the victim is entirely dependent on help from others, and in the absence of such help will inevitably die. Exposure is a syndrome, that is, a combination of various causes which combine to produce a common end result. The symptoms may develop with apparent rapidity, and death can ensue within as little as three hours after their appearance. The main component of exposure is hypothermia, a falling of the body's core temperature, leading progressively to collapse and, finally, death. Although hypothermia is the cause of death, its killing power is greatly increased by two other factors almost always present in 'exposure' deaths: shock (either physical shock caused by injury, or nerve shock caused by anxiety or fear); and exhaustion. A healthy person can survive a considerable degree of any one of these conditions, but the three combined rapidly prove fatal, especially to young people, who have been found to succumb much more quickly than adults in their twenties or thirties. It can be seen therefore that it is a mistake to look on exposure and hypothermia as being the same, although they are certainly closely related. Hypothermia, as has been said, is a lowering of the core temperature of the body. The normal temperature is 37°C, and death usually occurs at about 25°C. It is not necessary to be exposed to low temperatures to become hypothermic – all that is necessary is that the body should be losing heat faster than it is being manufactured by the metabolic

process. It is therefore better to think of 'losing heat' rather than of 'getting cold'. Heat is gained by the body in four ways – by the basal metabolic process; by exertion, which can increase the heat production by up to ten times the basal metabolic rate; by shivering, which can produce the same amount of heat as slow running; and by external means, such as radiation from the sun, from drinking hot liquids, or from taking a hot bath. Heat may be lost in five main ways – by radiation, which is an important cause of heat loss, especially through the head; by conduction, as when sitting on a cold rock; by convection as when in a wind; by respiration (cool air is being inhaled and warm air exhaled); and by evaporation, as of sweat, which is one of nature's ways of keeping the body from overheating.

The whole process of gaining and losing heat may be looked on as an equation which must be kept balanced, otherwise the body temperature will move out of the range within which life can be sustained.

In this country, we are nearly always concerned with heat loss rather than heat gain, and so it is important that everyone who is liable to be in exposure-prone conditions should know what to do to conserve body heat.

Before going on to deal with the conservation of body heat, however, I feel that an important word of caution should be given. Many people suffer considerable distress, not because of too little clothing, but because of too much. Not only is it difficult to move freely when encumbered by too many clothes, but the excessive sweating which inevitably takes places renders the wearer even more uncomfortable, and worse, ends in dehydration and excessive salt loss, which can cause cramps, headache and nausea, and greatly decrease stamina.

The most rapid and dangerous heat loss takes place in wet, cold and windy conditions, where wet clothing conducts heat away from the body (the insulation value of wet clothing is reduced by a factor of at least 10), where the wind evaporates moisture, which takes its latent heat of vaporisation from the body, and where the heat loss by convection is greatly increased. If in addition the victim has been overexerting himself and is breathless, the heat loss by respiration will be considerable. This is not serious so long as the victim can generate enough heat by exercise to balance the heat loss, but should he become exhausted or otherwise be unable to produce sufficient heat by exercise, then the body will rapidly cool down and serious hypothermia will occur. Add to this a state of shock or fear, which further reduces the body's capacity to survive adverse conditions, and it can be readily

seen that an extremely dangerous combination of circumstances has occurred. Although I can produce no concrete evidence to prove this, I am personally convinced from my own experience that the psychological aspect is at least as important as the others, and that as soon as a person submits to fear and becomes demoralised, his chances of prolonged survival are enormously reduced. Conversely, I have seen persons suffering very badly from exposure and rapidly approaching death, make an amazingly speedy recovery on realising that help was at hand, although as yet there is little that can be done on the hill to reheat a hypothermic patient, and all efforts are concentrated on preventing further heat loss. Pugh, in his Report to the Medical Commission on Accident Prevention, dealing with Accidental Hypothermia in Walkers, Climbers and Campers, states, 'The evidence is that unconscious or nearly unconscious patients revive spontaneously whatever treatment is administered once further cooling has been prevented'.

To prevent exposure, I suggest that three things are necessary: competence, good planning and good clothing. Competence will engender confidence and avoid demoralisation in adverse circumstances; good planning will avoid the possibility of trying to do too much, leading to exhaustion; and finally, good clothing will avoid unnecessary heat loss from the body.

Woollen underclothing is best, as wool retains a considerable proportion of its insulation value even when wet. I refer here not only to vest and pants, but to shirt, pullovers and trousers. Trousers especially are important as the legs contribute such a large percentage of the body's surface area. 'Jean' type trousers are not suitable for mountaineering, especially in winter. A thick cloth with a high woollen content is what is needed. The upper body should be covered by a windproof hooded anorak which will allow ventilation and prevent condensation problems. This should be long enough to completely cover the buttocks, and should have storm cuffs. It should be of a 'breathing' material and so it will not be entirely waterproof, but this is immaterial, as a completely waterproof cagoule and overtrousers should be carried in case of bad weather. The ideal headgear is a woollen balaclava, which can be worn as a cap or pulled down to cover the face and neck in bad weather. The saying, 'If the feet are cold, put on a hat', is not so foolish as it appears, and should be remembered, as a very large amount of heat can be lost through the head.

One final word about exposure. The aim of every party should be to avoid it. If it is encountered, then somewhere along the line

someone has failed. Diagnosis and treatment should be learned but ideally should never be needed.

Getting lost and becoming exhausted very often go hand in hand, and all too often are the fore-runners of death from exposure. Both can be prevented by good preplanning and working within one's abilities. Exhaustion can easily occur in a large party, where natural paces vary considerably. Everyone has his own optimum pace, and in a large party some members have to go too fast, and some too slow, so that the party may stay together. The ones who are going too fast are unnecessarily exhausting themselves, while the ones who are going too slow may well be producing too little heat to keep up their body temperature. Either extreme can very easily lead to exposure.

Exhaustion and dehydration on the hills can be more easily understood if it is remembered that an easy hill of, say 12 miles and 2,500 feet of climbing, is equivalent in energy consumption to a hard day's manual work, and that during the same easy hill day, one can lose almost 7 pints of water (normal – about 4 pints daily). These two dangers can be avoided by having frequent snacks of high calory foods, such as chocolate or dried fruit, and by drinking frequently. One is frequently warned against drinking stream water on the hills, but, provided the water is not contaminated, very little harm can be done. The dangers of dehydration are very much greater.

Haste is always a bad thing on the hill, and it helps one greatly to memorise the lie of a strange piece of country if one stops quite frequently to have a good look around. By doing this, one also sees what the terrain should look like coming back. Needless to say, one should at all times know one's exact position on the map, but if the worst comes to the worst, and one does get lost, the first thing to do is to stop and reason out the situation. At all costs avoid panic action like running. If possible, one should start working out one's approximate position by dead reckoning from the last known position, taking into account time, speed and direction of travel. Other points which may help are directions of slopes and streams, distinctively shaped natural features, lochs and so on.

In summer, one is unlikely to walk over a cliff, but it is very easy to do so in winter, when very often large cornices overhang the cliff edge, and when one may well be navigating in a white-out. In conditions of this sort, extreme caution is necessary, and if there are cliffs in the vicinity, it is advisable to rope up lest the leader should inadvertently go through a cornice. The possibility of this may seem unlikely, but it has happened several times in the Cairngorms in recent years.

No article on safety in the Cairngorms would be complete without some reference to the plateau bothies – the Curran, El Alamein and St Valery. By the time that this article goes to print, we hope that wise counsel will have prevailed, and that they will have been removed. While one tries not to be cynical, one cannot help noticing how few objected when they were built, but how many were knowledgeable about their dangers after the Feith Buidhe Disaster. I think that mountaineers have a lesson to learn from this – that they have a responsibility not only to protect the few remaining unspoilt wilderness areas, but to protect the vast mountain-ignorant public by speaking out loudly and without fear against undesirable and dangerous developments.