

# GREAT WHITE FRIGHT

**Do the maths this season to stack the avalanche odds in your favour.**

**By Roger Payne.**

**L**ast winter 55 people were killed in avalanches in the French Alps - the worst year for avalanche accidents since 1971. The French Minister of Sports described the deaths as "unacceptable" and said that there was "often a lack of sufficient mountain knowledge". So - just what do you need to know to avoid becoming a statistic?

Well, it would be wise for anyone heading into snow-covered mountains to understand something about avalanches. The British mountains have their particular avalanche characteristics - rapidly changing conditions and plenty of wind affected snow, whereas the Alps have a greater area and altitude range of snow-covered terrain. There are daily avalanche forecasts and avalanche manuals for both. But sometimes it's difficult to decipher exactly

what the forecast really means - and how do you differentiate between the key points and the interesting, but non-essential, detail? Worry no more. Having spent a fair amount of time in avalanche terrain, here is my suggested way of remembering the key principles for this coming season.

Some people may think that a 3x3 is a top of the range Robin Reliant or an all-terrain wheelbarrow. Those with knowledge of avalanche decision-making protocols know that it is a clever risk reduction calculation. However, for me it is a very basic way of understanding avalanches. The first "3" are the three key questions that anyone travelling in avalanche terrain should be able to answer; and the second are the main parts of the answer to the questions.

Descending from Mt Maudit, with some rather dodgy slopes visible. All photos: Roger Payne.



## Q: What do you need for an avalanche?

**A:** For an avalanche you need (1) snow, (2) a slope and (3) a trigger.

As snow falls out of the sky and forms layers on the ground it is affected by the ongoing weather. More precipitation (snow or rain), temperature changes, solar radiation, and wind all change the characteristics of the snow. Some of the changes create stability and a low avalanche risk; others cause instability and a high avalanche risk. Key points to know about snow are that both loose snow and firm slabs are able to avalanche, and that thin snow cover and low temperatures cause crystal growth and a weakening of the bonds between the snow particles; whereas deep snow and relatively warm temperatures (e.g. -1 to -5 degrees C) causes the snow to bond and become more stable.

For an avalanche to slide there needs to be a **slope**. The best angle for avalanches to fracture and slide is around 35-40 degrees (i.e. just the sort of angle of slope leading up to most winter climbs, and the steepness where skiing becomes really interesting). Also,

certain aspects of slope are more prone to avalanches. In the northern hemisphere avalanche hazard is more likely on chilly snow laden north faces.

The main **trigger** for avalanches where there is an accident is a member of the party. This is not as bad as it sounds, because it means that through education and understanding it will be possible to reduce the number of avalanche accidents. Any area of snow will have weak points where an avalanche could easily trigger (e.g. warmed snow falling from rock slabs and trees, a ground shape that is convex, or a ground surface that has low friction to hold the snow in place) and the snow pack will be in layers that can create sliding surfaces. There will also be areas of the snow that are stronger and where it is safer to ascend or descend (e.g. deep layers of well-bonded snow). A very important point to realise is that thin layers of poorly bonded snow will easily fracture, and the fracture line can travel a long way into deeper layers and cause a very large avalanche.

Snow pit analysis



## Q: How do you keep out of an avalanche?

**A:** To keep out of an avalanche you need (1) information, (2) to make observations, and (3) make the right decisions.

So, before heading out into the snow covered winter wonderland first gather the obvious **information** from guidebooks, study maps (how close are the contours on a 30-40 degree slope anyway?), and follow the trends in the weather and avalanche forecasts.

Then, when you get to your particular snow-covered paradise, **observe** what has, and is, happening with the snow pack and weather. Look for evidence of avalanche activity, the areas of current potential high risks, and those areas that seem to have a very low risk. Check the latest forecasts, and if necessary carry out your own stability tests and a profiling exercise. Remember that these are effective ways to see and understand the significance of layers in the snow pack, but they can be an inexact way of making a decision to take a particular route. For example, in a day's journey or climb in the Alps you could be on snow slopes that vary in angle between 15 and 45 degrees; that cover a wide range of terrain shapes and type; that in some areas have triggers present; that at times face north, east, south or west; are at altitudes between, say, 1500m and 3500m; and finally will have varying exposure to the current weather and changing daytime temperatures. So, there is always going to be a range of hazard level depending upon the exact location and time of day. The trick to safe travel is to be constantly sensitive to the changing level of hazard; and making the right decisions to minimise your exposure to risks and to enjoy the best conditions on your climb or journey.

Finally, the most important dimension of travel in avalanche terrain is combining the information you have gathered, the observations you have made, and applying your knowledge and understanding to make the right **decisions**. Many people who get avalanched knew at the time that there was a high risk, but somehow failed to avoid or minimise their exposure to the risk. Once you realise that you have to travel through a particular area with an avalanche risk you should minimise your exposure (e.g. by taking a line that is least likely to trigger an avalanche, and moving one at a time to points of safety).

John Harin heading for the Super Coluir.  
Avalanches are less of a risk on technical ground  
- but you still have to get there!



Avalanche rescue exercise, Leysin.



## Further information

There is a lot of avalanche information online and in various DVDs and manuals. Lesser-known sources are the transceiver manufacturers, and the National Avalanche Institutes in the Alpine countries (e.g. the Swiss Federal Institute at [www.slf.ch](http://www.slf.ch)).

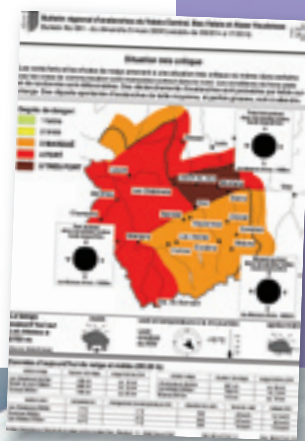
### Avalanche training courses:

[www.pyb.co.uk](http://www.pyb.co.uk) - Plas y Brenin

[www.glenmorelodge.org.uk](http://www.glenmorelodge.org.uk) - Glenmore Lodge

A number of British Mountain Guides ([www.bmg.org.uk](http://www.bmg.org.uk)) also run avalanche training in the Alps including Nick Parks ([www.mountaintracks.co.uk](http://www.mountaintracks.co.uk)), Steve Jones, Bob Barton and Mark Diggins ([www.euro-avalanche.com](http://www.euro-avalanche.com)), Julie-Ann Clyma and Roger Payne ([www.ski-off-piste.com](http://www.ski-off-piste.com) and [www.avalanchetraining.info](http://www.avalanchetraining.info)).

Oops. It's a Cat 5 avalanche risk. But do you know what that means?



Performing a block test.

## Q: What do you do when someone is caught in an avalanche?

**A:** If someone is caught in an avalanche it is essential to (1) observe what is happening, (2) organise yourself and others, and (3) start a proper search for the victims.

The point at which someone was last seen and any of their equipment on the surface of the avalanche are very important clues as to their likely position in the debris. So careful **observation** during the avalanche and of the debris will speed up the search for victims.

Good **organisation** makes a huge difference to the efficiency and effectiveness of any search and rescue operation. Victims have a very high chance of survival if they are found in less than 10 minutes, so it is the people at the scene of the avalanche who can save lives. You should not rely upon the quick arrival of other rescuers - by the time

they arrive the chance of survival will be much lower for anyone who is buried.

The actual **search** should be in three stages with the first stage being a quick look for any additional visual clues and the first sign of an

avalanche transceiver signal, the second stage is closing in on the actual burial area, and the third stage is finding the exact location of any victims. Transceivers make it quite easy to get within 2 or 3 metres of an avalanche victim, but finding the exact location can only be done quickly if the searcher is methodical in the third stage, and using their transceiver in combination with an avalanche probe and shovel. By using a proper search pattern and a combination of transceiver, probe and shovel it is possible to find avalanche victims quickly and avoid suffocation.

Don't be misled into thinking modern transceivers will just home straight in on the victim. With both analogue and digital transceivers the final exact position is hard to pinpoint because of the curved nature of the radio waves coming from the transmitting transceiver - which becomes even more complex in deep burials and confusing if there are multiple victims. The single best way to increase search efficiency is to practice transceiver search techniques.

Other modern innovations include emergency floatation balloons and breathing aids. These help to avoid burial and extend survival time, both very handy, but it's obviously preferable not to need them in the first place. Instead, make sure you have a good supply of the "mountain knowledge" as suggested by the French Minister. Of course, knowledge like this can't be acquired just through reading, so consider getting training from those with experience. Being cautious about avalanche hazards will help make sure you're around to enjoy the whole winter's snow. And as Whymper famously said: "remember that courage and strength are nought without prudence. Look well to each step, and from beginning think what may be the end." ■

Roger Payne was a General Secretary of the BMC and is an IFMGA Mountain Guide, now guiding from a base in the Swiss Alps.