

Everything you wanted to know about

Avalanches*

by Douglas Gantenbein
sports editor

Everything pointed towards a perfect day of snowshoeing.

The weather was fine, with a little gusty wind but clear skies and a warming sun. A heavy storm the previous night had deposited a fine deep layer of snow across which a little group of three was happily plowing through.

They traversed a hillside of timber, then came to an open gully, with just a few bent trees on it. They peered up the slope and admired a fine, wind-sculptured overhang of snow. Looked solid enough.

So the leader headed across the slope to the forest on the far side. No problem. Laughing and yelling, he called his companions across.

They were just about over when they heard a loud "whump" and looked up in horror to see the cornice atop the slope break loose and roll rapidly their way. They tried to run for it but their snowshoes slowed them and before they had gotten a few yards the white tide rumbled over them.

Then just as suddenly as the avalanche came, it stopped. The mountain again was quiet, leaving a now lone hiker standing in shocked silence.

This is a scenario becoming increasingly likely and common as thousands more people annually are discovering the world of winter sports away from the carefully groomed ski slopes and long lift lines.

This year especially, with frequent and heavy storms depositing large quantities of snow the threat of potentially murderous avalanches is high.

And yet, few people are really aware of just what constitutes high avalanche danger. Indeed, the common picture of an "avalanche" is of a churning mass

of powder snow hurtling down a high alpine slope.

The fact is that those types of avalanches, caused by what is known as "wild snow" are virtually unheard of in the Western states. Far more common are smaller avalanches caused by loose, wet snow or the more dangerous "slab" types in which blocks of solid snow slide whole down a hillside.

In fact, many avalanche-related deaths are caused by fairly small slides of 300 feet or less. As U.S. Forest Service recreation specialist Roland Emetaz said, "Even the small ones are killers."

But like the Northwest weather that causes them, avalanches are far from easy to predict. As U.S. Forest Service recreation specialist Roland Emetaz

snow, or worse, greasing up the whole works. "Rainwater percolates through the snow," said Emetaz. "It'll hit an old rain or sun crust, the moisture acts as a lubricant and it'll slide."

Naturally, gravity is an important factor so the degree of the slope is important. Surprisingly, the steepest slopes to NOT produce the most slides—hills of about 30 to 45 degrees (60 to 100 per cent) are the most treacherous ones.

Yet, shallower angles can be hazardous, too. "It's difficult for people to relate to 25 degrees," Mt. Baker National Forest snow specialist Paul Frankenstein noted. "They can better judge 30 degrees, because they relate that to the side of a triangle, yet they should watch for slopes less steep than that."

Finally, wind can add to avalanche danger by blowing snow into precarious positions, such as the cornice (an overhang of snow) that surprised our friends at the start of this story. If the wind is strong enough to blow snow off the top of a hill, it's a sure bet that it is also strong enough to create hazardous deposits on the lee side of a hill.

Spotting avalanche danger
So, by now you're no doubt certain that every flake of snow in the woods is waiting to crash down upon your head, wreaking havoc on you and your person.

Not so. Certainly there are hazards but a careful and watchful person can avoid them.

When on the trail, look for recent signs of avalanche activity such as the bent trees our ill fated group of three saw. Avalanches aren't like lightning, they'll strike the same place frequently.

Small disturbances should be noted as well, such as snowballs or "pin-wheels" tumbling down a hill. They could be a harbinger of bigger things to come.

Try to hike on the windward side of a hill, opposite any cornices there might be. Or, if you must walk the lee side, stay in the valley as far as possible from the hilltop.

Timbered areas rarely avalanche, so hiking through them is relatively safe. Ridgetops are also safe, although care should be taken not to disturb any cornices there might be.

If you must cross dangerous slopes, do so near the top. Never traverse an exposed slope when ascending or descending. Go straight up or down.

And, check ahead of time to find what the potential avalanche danger is for a given day (see inset). The Forest Service and weather bureau both have avalanche information available.

The wilderness is a place to have fun, but those who don't respect its dangers are asking for serious trouble. Enjoy yourself, but be careful.

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said, "It's a very imperfect science. There are just too many variables."

Still, Emetaz and other snow experts say there are some good, general rules regarding avalanche threat prediction.

Two main slide types
First, just what types of avalanches are there? Two, basically—the loose snow and slab types mentioned in the above paragraphs.

As their names imply, those differ basically in how they are put together. Loose snow avalanches are often caused when the snow crystals lose their shape due to melting and no longer interlock. Typically, a loose snow avalanche will start with a small point of instability and spread to encompass a larger area.

Loose snow avalanches may be triggered by a passing skier, or simply start when the snow can no longer support itself.

Either way, the conditions that spawn them also lead to their demise, as wet, melting snow that most frequently leads to loose snow avalanches is also quick to stabilize into a compact mass.

The more threatening avalanche type—the slab avalanche—is a product of snow crystals bonding together into a rigid mass. Unlike loose snow slides, a slab avalanche will break at once over an entire area.

Slab avalanches typically have a high mechanical strength and are capable of withstanding a considerable amount of stress before breaking loose. As a result, an entire platoon of skiers may cross a slab, but the steps of the last person crossing may be the little extra bit of stress that could cause a fracture. One case on record in Switzerland is of a slab being dislodged by the last three men of a 34-man military patrol.

The explosiveness that most slab avalanches display is due to their tendency to "creep" downhill. As the slabs inch down the mountain, they stretch like a drumhead and tension is built up.

Then, when they finally break a great deal of energy is released at once.

The amount of pressure built up depends a great deal on the temperature of the snow. Temperatures around freezing soften the snow and allow a great deal of creep in a short period of time, creating a relatively short danger period.

Low temperatures, on the other hand, allow tension to build up gradually, creating a long danger time.

Causes of avalanches
Avalanches are triggered by a number of related factors with "perfect" avalanche conditions, occurring frequently at this time of the year: heavy snowfalls and high winds followed by rising temperatures.

For the snow traveler, a half foot of new snow is suspicious, a foot of it ominous and any more than that an avalanche is just waiting to happen.

The rate of snow is also a factor. Three feet of snow that fell over the space of a few days is probably well consolidated, but a foot of snow in a couple hours can constitute a real danger.

Another variable is the type of snow that is falling. A soft flake with a well-defined crystal structure will interlock and stabilize with other flakes easier than a hard, sleety type of snow. Catch a few on your mitt to examine them.

But one of the most critical factors is temperature. Cold powder snow atop a warmer, wetter base is a fairly stable combination, but the colder snow does not bond together well, and should a heavy coat of wet snow fall on top of cold snow it doesn't have the strength to support the load.

The rain storms that often follow a warm front can add to the hazard, increasing the weight of the surface

If you're caught in an avalanche

"It's a helluva lot better to avoid them," says Zigzag ranger station avalanche expert Wendy Evans, but should you be so unfortunate as to find yourself in the path of an avalanche there are a few rules to follow that might save your life.

First, when in a potentially dangerous area, be sure you have good body protection with gloves and hat on and all outer clothing securely fastened.

Then, check to see that all ski straps and poles are loosened so they can be quickly discarded in an emergency.

If an avalanche starts and you see that you won't be able to escape, dump as much of your equipment as possible. If on a snowmobile get away from the vehicle.

When the snow strikes, make vigorous swimming motions. Try to stay on top of the avalanche, and move off to one side if you can.

The critical time comes when the snow mass begins to slow, for as Evans said "once it stops it's like cement." Keep one or both hands in front of your face and push the snow away to make an air pocket. "If you don't have an air space, the chance of survival diminishes greatly," Evans points out.

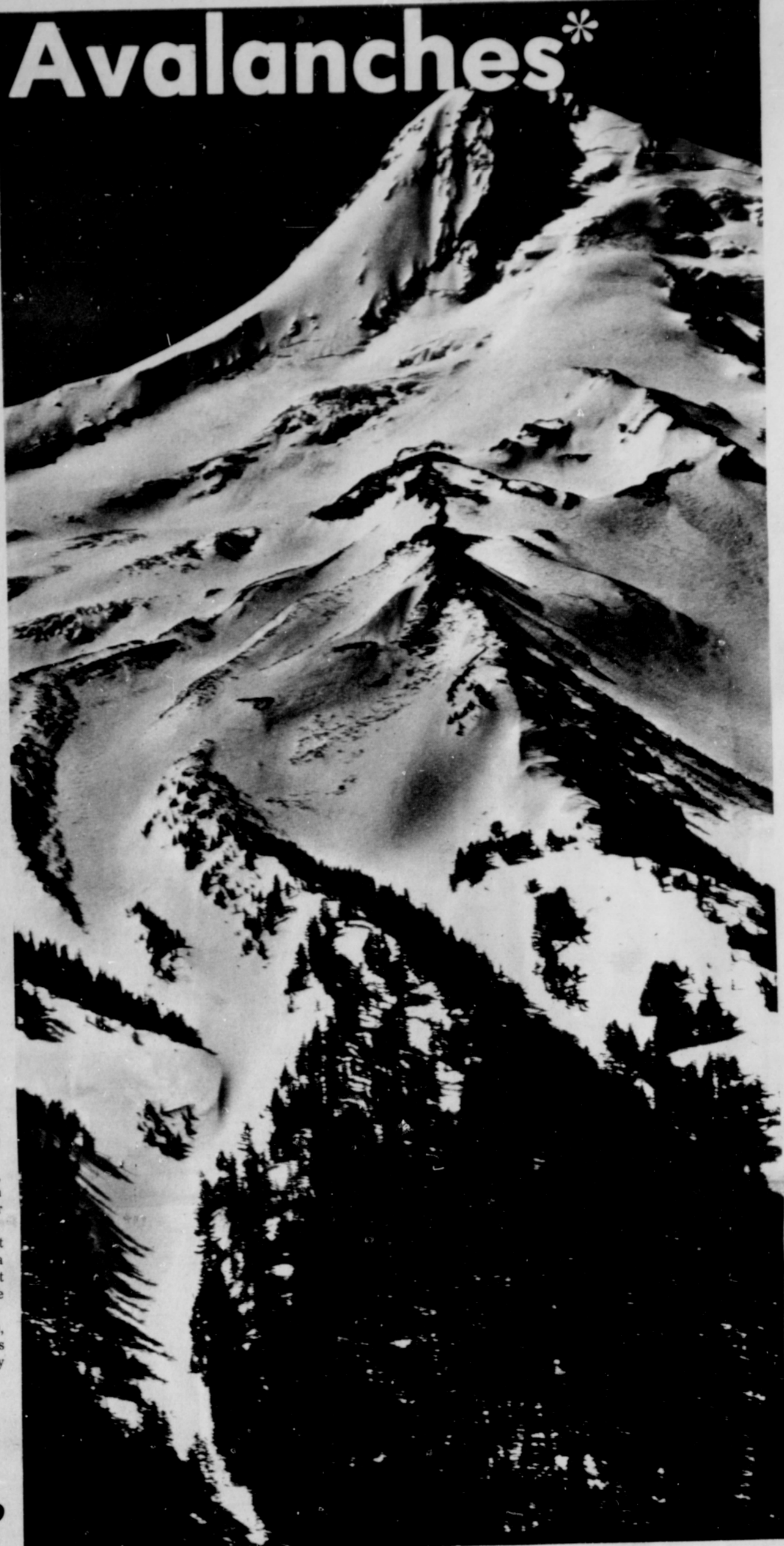
If you are the survivor of an avalanche, you are your trapped partner's best chance of survival. Unless there are several members in your party and help is just minutes away, don't leave the area as avalanche victims rarely live more than 30 minutes and it may take hours to get up a rescue party.

Instead, immediately mark the spot where the victims were last seen and begin searching the area beneath it. If they are not visible from the surface, scuff and probe the surface with a stick or ski pole.

When the victims are recovered, treat them for suffocation and shock and get them to a first aid station as quickly as possible.

Evans said that the number of avalanche survivals depends a great deal on the kind of people you ski or snowshoe with, so know your partners and be certain they are aware of the hazards avalanches present and how to cope with them.

Finally, always remember that help may be hours away. Think of your group or even yourself as a self-contained unit, capable of meeting any crises on its own. When planning a trip, plan for the worst possible event and pack food, clothing and first aid gear accordingly.



ELLIOTT GLACIER on Mt. Hood: A common site of avalanches. (Photo courtesy U.S. Forest Service)

*** But were buried to deep to ask**

Check the snow before you go

Before going on a backcountry snow outing, Zigzag ranger Wendy Evans recommends that you check on recent avalanche conditions before heading out.

At Government Camp, daily backcountry conditions are posted every day except Wednesday. These reports provide capsule summaries of danger areas in the Mt. Hood area based on

weather conditions, snowfall, the amount of moisture in the snow and a report from Mt. Hood Meadows.

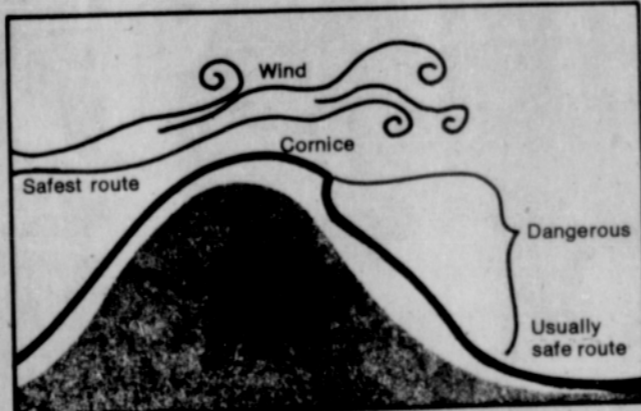
For the most accurate avalanche conditions, Evans said the Forest Service strongly recommends the purchase of a small VHF weather band radio tuned into the National Weather Service continuous broadcasts at 162.550 MHz.

The continuous National Weather Service broadcasts provide the most complete and up-to-the-minute information, Evans said.

Other general information can be gathered by calling the Weather Service in Portland, or by tuning to television news broadcasts. During times of severe avalanche danger Portland stations give current con-

ditions and applicable elevations.

Evans said that in all cases the reports apply only to backcountry areas, not to controlled ski areas. "A lot of people hear these reports and get scared off the mountain," she said. "But it's just for the uncontrolled areas."



THIS DIAGRAM shows the safest route around a snow-covered hill and illustrates how the wind will form dangerous cornices on the lee side.

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