Case Study: The European avalanches of 1999

The avalanches that killed 75 people in the Alps in February 1999 were the worst in the area for nearly 100 years. Moreover, they occurred in an area that was thought to be fairly safe. In addition, precautionary measures had been taken, such as an enormous avalanche wall to defend the village of Taconnaz, and a second wall to stop the Taconnaz glacier advancing onto the motorway that runs into the mouth of the Mt Blanc tunnel. However, the villages of Montroc and Le Tour, located at the head of the Chamonix Valley, had no such defences.

The avalanche that swept through the Chamonix Valley killed 11 people and destroyed 18 chalets (Figure 9.30). Rescue work was hampered by the low temperatures (–7 °C), which caused the snow to compact and made digging almost impossible. The avalanche was about 150 metres wide, 6 metres high and travelled at a speed of up to 90 kilometres per hour. It crossed a stream and even travelled uphill for some 40 metres. Residents were shocked, since they had not experienced an avalanche so powerful, so low in the mountains and certainly not one capable of moving uphill.

Nothing could have been done to prevent the avalanche. Avalanche warnings had been given the day before, as the region had experienced up to 2 metres of snow in just three days. However, buildings in Montroc were not considered to be at risk. In fact, they were classified as being in the 'white zone', almost completely free of danger. By contrast, in the avalanche danger zones no new buildings have been developed for many decades. Avalanche monitoring is so well established and elaborate that it had caused villagers and tourists in the 'safe' zone to think that they really were safe. In Montroc, the experience was the equivalent of the eruption of an extinct volcano – the last time the snow above Montroc had caused an avalanche was in 1908.

Meteorologists have suggested that disruption of weather patterns resulting from global warming will lead to increased snowfalls in the Alps that are heavier and later in the season. This would mean that the conventional wisdom regarding avalanche 'safe' zones would need to be re-evaluated.

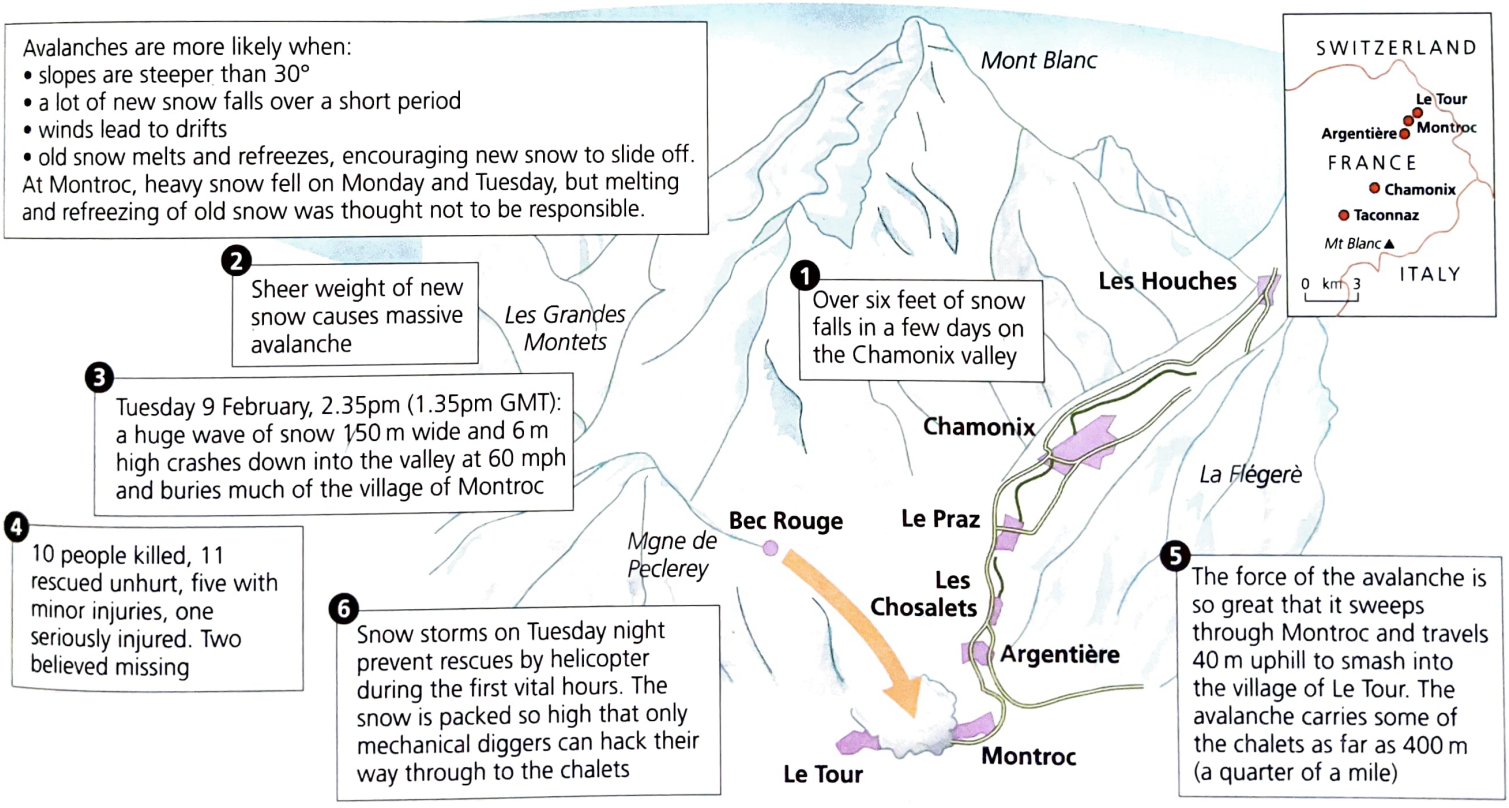

Figure 9.30 Causes and consequences of the Montroc–Le Tour avalanche

Snowslides 2009–10

In December 2009 and January 2010, dozens of people were caught in the path of avalanches. The increase in snowslide activity sent ominous rumblings through the communities of Europe's Alpine resorts. Residents live in fear of seeing a repeat of early 1999 (see above, when 75 people were killed over a period of three weeks), or even of 1950–51, when more than 265 people died in three months.

Heavy snowfall combined with rain and an easing of the extreme cold prompted Météo France, the national meteorological service, to raise the avalanche warning to level 4 (out of 5), meaning 'high risk'.

In 2009, scientists in London warned that global warming, in the form of rising temperatures and melting permafrost, could make avalanches more frequent.

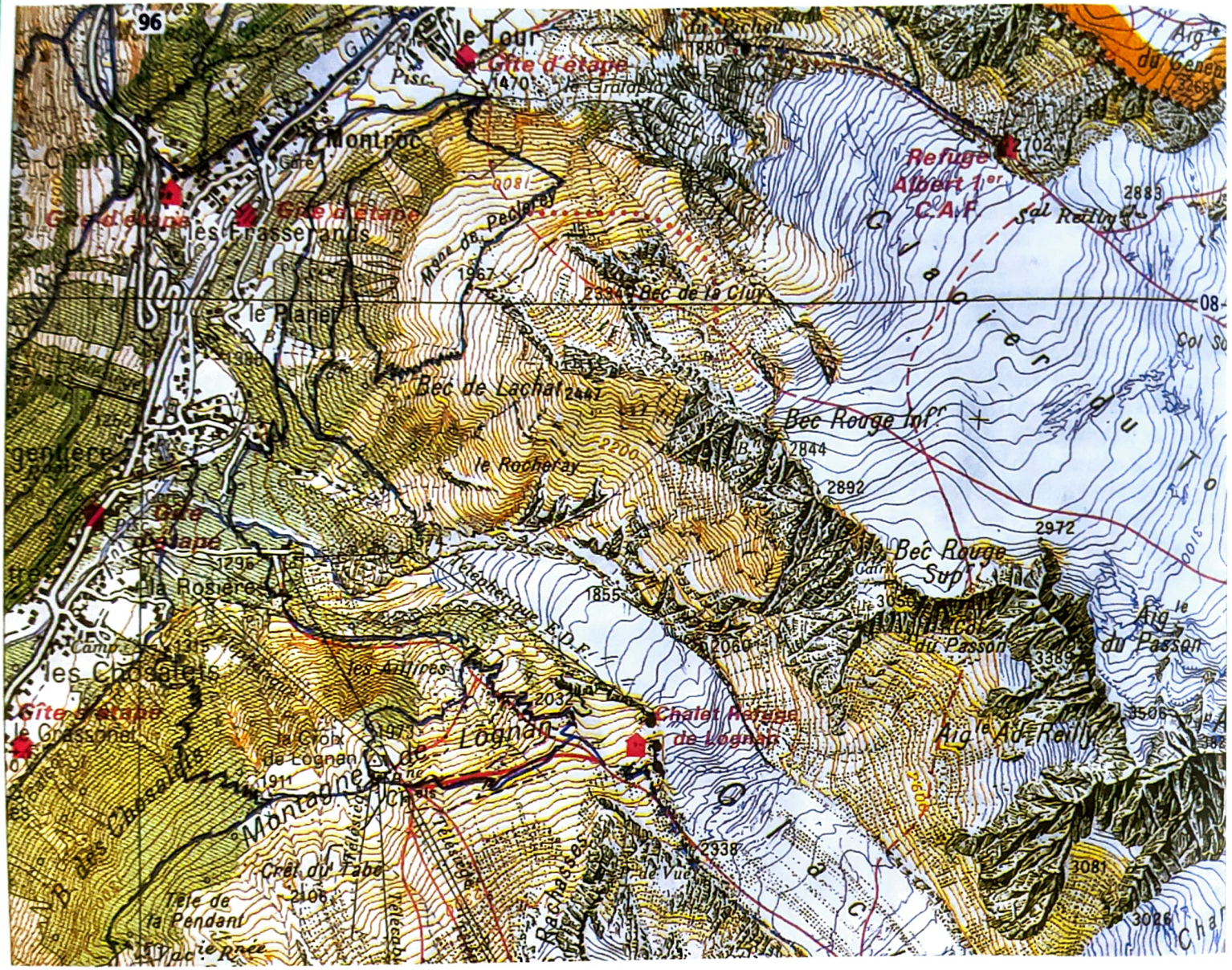

Figure 9.31 Survey map of the Alps – area affected by 1999 avalanches