

snow and the ice cliff underneath were now safe to practice crevasse rescue. The rest of the course went normally.

Analysis

My mistake was acting automatically (choosing a similar slope and ice cliff as the last year and the year before) and not using enough thought in action. I should have initiated a snow stability test. Especially since this was a class, we should have spent a good amount of time on analyzing the conditions (pit, layers, compression test, angle estimate, etc.) and reviewed the students' avalanche knowledge.

The mistake of others was not thinking for themselves and relying on my thinking. They should have questioned whether what we were doing was safe. Nobody voiced any concern.

How do we learn from this?

- Prevent acting automatically. Think of what you are doing.
- Be self-sufficient; think for yourself and don't rely on thoughts of others. Safety is everyone's responsibility.
- Even relatively short moraine slopes can pose an avalanche danger. Test the slopes before you use them.

Should we carry beacons on the Castner Crevasse Rescue Course? One of the questions asked by students at the planning meeting before the trip was whether they should have beacons. My answer was that they don't need beacons because we won't be in an avalanche prone area. I encouraged them to have shovels and probes, though (even though at that time I mainly meant it for camping and testing crevasses).

Next time, I still wouldn't require the participants to have beacons, but I would at least recommend them. I think most years we will be able to eliminate avalanche danger by proper selection of ice cliffs to practice on. But good cliffs are scarce and it can sometimes happen that the only suitable ice cliff will have an avalanche slope above it. Beacons could be useful in that situation. I still don't see them as a necessity, though, because we are talking about small avalanches and chances are high that people won't get completely buried and if they do, chances are high that even without beacons they will be quickly found, given the number of people around and given the relatively small area covered by the avalanche. (Source: Tomas Marsik, age unknown)

HAPE, ALLOWED TO DESCEND ALONE, POSSIBLE CO POISONING

Alaska, Mount McKinley, West Buttress

The 2008 Ulsam McKinley Expedition, led by Jeong Sang Kim (34) flew onto the glacier on May 1 and climbed to the 14,200-foot camp in eight days. The expedition stayed at the camp waiting for better weather to ascend to the 17,200-foot high camp, and during this time had made at least one carry

to the base of the fixed lines at 15,400 feet. The group then made their move to the high camp on May 15. However, Kim felt ill after arriving at the fixed lines and elected to descend while the rest of the expedition continued up. While he was descending solo, he was observed by the NPS patrol stationed at the camp. The patrol noted that he required multiple rest stops while descending and that he could not walk the remaining 200 meters of level ground into the 14,200-foot camp without sitting down twice to rest. The patrol ranger and primary medic contacted Kim, and after a brief physical exam discovered that he had an oxygen saturation of 51 percent, the normal for this altitude being approximately 84 to 89 percent. The one abnormality noted was that pulmonary rales were not found during auscultation. Kim was diagnosed as suffering from atypical High Altitude Pulmonary Edema (HAPE) and brought to the medical tent for treatment. While on low flow oxygen via nasal cannula, his oxygen saturation began to fall to the low 40's. He was immediately placed on high flow oxygen with a non-rebreather mask. Following contact with medical control, he was then administered Diamox and Albuteral. The Incident Command system subsequently was activated and the park helicopter was placed on standby for an evacuation, but poor weather conditions prohibited any evacuation attempt that day. Kim remained in the care of NPS personnel throughout the night and was kept on oxygen. The rest of the Ulsam expedition returned to the 14,200-foot camp the following day and were informed about his condition. Another physical exam was performed to evaluate the possibility of Kim descending with the assistance of his fellow team members, but it was discovered that his saturation level would plummet shortly after being taken off oxygen and not performing any physical exertion. Based on these findings, Kim and another patient were evacuated from the 14,200-foot camp during the evening of May 16 by the NPS Lama helicopter. After being flown to Talkeetna, the two were transferred to a fixed-wing medical evacuation flight for transport to the Alaska Regional Hospital. Kim's symptoms had resolved and he was released following his examination at the hospital.

Analysis

Kim was fortunate in that the NPS staff suspected that there was something irregular occurring and undertook an investigation. There is a strong possibility that had he gone to sleep alone in his tent that evening, he could have died. Kim's medical condition worsened even after being placed on low flow oxygen and necessitated aggressive medical treatment on the part of the NPS patrol to stabilize him. When I went to consult with the expedition leader, I discovered that while the group was cooking outside the tent, they were using a portable isobutane-style stove to heat the interior. They indicated that this was a normal practice and erroneously stated that since it was a single small stove, there wasn't any danger from it. The expedi-

tion had maintained a prudent acclimatization schedule, but the practice of heating their dome tent with a stove put every member at risk of carbon monoxide poisoning and may have contributed to Kim developing HAPE. In addition, splitting the expedition and allowing an ill member to descend by himself could have resulted in Kim's death by the simple fact that no one would have been aware that he was in respiratory distress. Furthermore, un-roped travel on glaciated terrain is not recommended because of the danger of falling into crevasses. (Source: John A. Loomis, Ranger, Denali National Park)

FROSTBITE – DEHYDRATED, FAILURE TO PAY ATTENTION TO WARNING SIGNS

Alaska, Mount McKinley, West Buttress

Hervé Laurence (40) was a member of a party of eight French climbers who were planning to ascend via the West Buttress. This group departed on May 6 and purportedly arrived at the 14,200-foot camp on May 12. Following a brief stay for acclimatization the expedition, attempted to climb to the summit in one push. The expedition departed at 0400 on May 16. Laurence reported that his feet were very cold and never warmed up. At 0900, the expedition arrived at Denali Pass. Laurence determined that his hands were now frostbitten and so elected to turn around with one climber. Upon reaching the 17,200-foot camp, the two sought assistance from fellow climbers, who in turn contacted the NPS patrol at 14,200 feet via FRS radio for advice. When questioned, Laurence and his partner stated that they could climb down so they were instructed to continue their descent to 14,200 feet and seek out the rangers upon arrival. The two arrived in camp at 1800. A physical exam was performed. Although Laurence was only complaining of frostbite to his hands, a full exam was accomplished and it revealed that Laurence had deep frostbite on the toes of both feet and superficial frostbite on the fingers of both hands. When Laurence was asked why he didn't turn around when his feet began to freeze, he replied that he had suffered frostbite to his feet two times previously and they had always healed without any complications. Further history revealed he had only consumed 1.5 to two liters of water in the previous 48 hours. Following treatment, the patient was evacuated to Talkeetna and then to Anchorage.

Analysis

This case of frostbite was caused by the climber not hydrating properly and ignoring warning signs. During the climbing briefings conducted by the National Park Service, adequate hydration and the warning signs associated with frostbite are stressed. The climber also stated that he had been wearing mittens when his hands froze. His boots were La Sportiva Olympus Mons,