

to climb a fixed rope. He slipped and fell below the rope about 150 feet where he was killed.

*Source:* Carl Heller.

*Analysis:* This is a classic example of inexperienced persons who needed an adequate rope, a knowledge of belays, and a realization of the need for belays.

*Alaska, Mt. Marcus Baker.* On 22 June Helga Bading, John Bousman, Aaron Schnieder, and Ruth Schnieder (25) were ascending the Knik Glacier. While taking over the lead to break trail in waist deep snow Ruth stepped through a hidden bergschrund and fell approximately 30–40 feet hitting a projection during the fall with her left leg and side. She did not lose consciousness at any time and was able to assist in hauling herself out (they could not use the normal technique of two ropes with the person alternately standing in loops — or prussics — since Ruth could not stand on her injured leg). Since they were changing the lead at the time, Ruth's rope was slack and allowed her to fall a considerable distance before the pull came on the rest of the party.

*Source:* John Bousman.

*Analysis:* We should have been belaying during the change of trail breakers since a person walking past a party would not have the protection of a tight rope as normally would be expected in continuous roped movement on a glacier. We miscalculated on the chances of crevasses in the particular area, so did not belay.

*Alaska - Hayes Range* — On July 24th Don Jensen (21) and I (Dave Roberts, 21) were hiking across the east fork of the Gillam Glacier at an altitude of 6700 feet. It was the thirty-seventh day of our two-man expedition, which was now attempting to reach an airdrop site in a basin west of Mt. Hayes, only three miles away. The drop, including twenty days' food, had been made about six weeks previously. We were travelling with 75-pound packs, wearing light aluminum snowshoes. At about 1:00 P.M. (temperature about 28° F.) Don, leading, sank in to his chest in snow apparently bridging a crevasse. At the other end of the rope I immediately anchored Don. He flailed around, unable to get out. At last I anchored the rope with my axe and an extra axe, untied, and walked up to help Don get out. As we were maneuvering, the snow broke around Don and he fell, ripping out the axes. Standing only ten feet from the crevasse, I grabbed the rope, but it was wet and slipped through my hands unchecked. Don fell sixty feet free, landing upside down on his pack, wedged between two walls of ice. He received a cut and possible concussion on the head, about five sprained fingers (at the time he thought his right thumb was broken), and a badly bruised right thigh.

After a few moments he was able to answer my shouts. We could barely hear each other at the top of our voices. Don warned me to stay away from the edge of the crevasse, since the lip overhung a gigantic interior. He could see that it would be impossible to climb out of the crevasse, even after he had changed to crampons; he would have to prussic out. First, therefore, we had to get his pack out. From my pack I got parachute cord, slings, carabiners, stirrups, even boot laces, and

tied them all end to end. At last I had about eighty feet, enough for a hauling line. Don and I had managed to orient with respect to each other, so he knew where I was and I knew which way the crevasse ran. During this part of the operation I got no closer than twenty feet from the hole Don had fallen through. I threw one end of the hauling line into the crevasse and lowered it. Don tied on a small load, but when I pulled it up the line cut back into the lip of snow, and the load stuck under the lip. We realized that I had to cut away the crevasse lip back to hard ice.

I returned to the other end of the climbing rope, where the axes were attached. I had our snow shovel, so I dug a pit in the snow about three feet deep, planted the axes, then buried them. After a while they froze in, making a very solid anchor. Then I attached a sling to my waist loop and tied it with a prussic knot to the climbing rope. Using this sliding anchor, I could get very near the crevasse. Don got out of the way somehow, and I chopped and shovelled away the loose lip of the crevasse, cutting back about ten feet to hard ice. After that the hauling went smoothly. As soon as the last load was up, I lowered prussic slings to Don. He was very cold and wet, and he could use his fingers only clumsily, but with a slow, steady effort he got out five hours after he'd fallen in.

We now had five days of food left, and we knew a hike out would take five days. We had two choices: to push on and hope to find our airdrop, or to hike out. Because of the danger of the glacier, and the chance that the drop had been buried under the heavy snows of the last month, we decided to hike out the Susitna Glacier and River.

I led most of the next day, but in the afternoon, with Don leading at 6000 feet on the Susitna, on apparently safe glacier, he suddenly plunged into a crevasse as he was probing. I belayed him immediately, but because of rope stretch and the rope cutting into the lip of the crevasse, he fell thirty feet, cutting his chin and lip badly on sharp ice. He took off his pack and put on crampons, then chimneyed out the narrow crevasse. I gave him codeine and my down jacket, and chimneyed down to get his pack, which I finally managed to haul out in one piece. We set up camp and tried to treat Don's cuts. Beneath his lower lip there was a hole completely through his cheek. We washed the cut as well as possible, and eventually it stopped bleeding and began to scab. Don had trouble eating, but could manage very small bites.

Taking codeine and empirin regularly, plagued not only by the cuts but by his bruised thigh and sprained fingers, Don pushed on with magnificent drive. We decided not to give him oral penicillin or tetracycline because he was going well and we didn't want to risk a reaction. In four days over rough country we were out.

By the time we got to Fairbanks, Don's cuts were badly infected, but the drugs he later took caused a reaction of high fever and arthritis-like stiffness in his joints that lasted for a few weeks. Since then he has had several minor operations, but is fully recovered.

*Source:* David S. Roberts.

*Analysis:* The obvious criticism is that two men are too few for an expedition. Had Don broken a leg, for instance, it would have been

very difficult to get him out alive. Also, with three or more, one of us could have belayed Don while the other tried to help him out of the crevasse, when he was stuck chest-deep in it. Moreover, if there are four, one can stay with an injured man while the other two go out for help. However, I think the following considerations apply to expeditions of all sizes: 1) A belay which catches a man in mid-air, with a 75-pound pack on, can be worse than none at all. A man could only hang from his waist with that weight for a few moments before becoming unconscious. Even if he had attached prussic slings to the rope beforehand, he couldn't prussic out by himself, since the rope would cut into the lip. 2) No group of people would have been large enough simply to haul Don out of the first crevasse. 3) We were carrying a radio, one of whose transistors had apparently burned out. If the radio had been working, we could have contacted Fairbanks immediately (if necessary), and a pilot could probably have landed on the glacier. However, a party obviously cannot, nor did we, depend on a radio.

The problem of crossing in July or August a glacier like the east fork of the Gillam (which had never been explored) is a serious one. Our accident happened in mid-day. However, we had been hiking at night the previous few days and actually found temperatures and snow conditions the same. It is impossible to probe for a crevasse like the ones Don fell into: even with a long pole you have to be on the snow bridge to probe for the crevasse; even then the probe may penetrate snow all the way (as on Don's second crevasse); snowshoes, though a help, clearly don't eliminate the danger; the crevasses are unrecognizable from the surface, except in an unusual oblique light.

As for belaying technique: we were going continuously, a full rope-length apart. One cannot belay every step on a glacier if he expects to travel more than a mile a day. We felt that being as far apart as possible was safest, since it minimized the danger of both of us falling into a crevasse that ran the way we were walking. We didn't carry coils, since they only make more slack on a belay. During Don's second fall, I was actually looking at him when he fell, and reacted instantaneously, but he still fell thirty feet.

The only solid anchor on an Alaskan glacier in July or August may be the buried axe. It is a good idea to have prussic loops already attached to the climbing rope; at least after a fall one might quickly take the pull off his waist. Prussicing is an utter necessity in a big crevasse with overhanging walls. On an expedition a pack cannot be abandoned; usually it must be got out of the crevasse before the climber. The insides of crevasses are frightening, unpleasant places; the ones Don were in were very wet, with streams of water everywhere, and vast detached blocks of ice overhead, threatening to come down on him. A person can quickly die of exposure in a crevasse.

It is a hard decision whether or not to give drugs to prevent infection in the mountains. In Don's case, a reaction such as he later got would have been far more serious on the trip than the infection he did get. And Don had no medical history of reaction to antibiotics. If the end of an expedition is near, perhaps it is best not to give drugs.

Sanitation is vital, but hard to maintain, especially in a cut in the mouth.