

ket at this location. The weather conditions were extreme, with high winds, heavy snow/sleet and 30 degree temperatures.

In conclusion, there are some key points to keep in mind. 1) Royal Arches is a 17 pitch route rated at the YDS 5.7 A1 level, and is well described in the first chapter, "Staying Alive," of the guide book they had. The specific problems they encountered are discussed. 2) Their clothing choice needs no further comment. 3) They did not adhere to a turn-around time. 4) Not knowing how to prusik resulted in taking more time to untangle the ropes. 5) By tying their two ropes together, they could have made a single rappel to the ground from the ledge where they bivouacked. (Source: From Yosemite National Park Case Incident Reports)

FALL ON ROCK, EQUIPMENT FAILURE—CARABINER BROKE

California, Lover's Leap

Gear worries were far from our minds on a beautiful June morning when Tom Stargaard and I were heading off to Lovers Leap for a day of climbing. The recent cover photo on *Climbing Magazine* had renewed our interest in this fine area, and we hoped to spend the day climbing a few of the classics.

A trio of climbers was completing The Groove, but since they appeared to be setting up a top rope, we decided we would also have to forgo this last of the classic pitches on the Lower Buttress. After passing The Farce, we looked over at a steep crack that we had known about for a few years, but had never actually climbed. It was reputed to be a short, awkward 5.10a/b crack that lacked character. After a brief discussion, we decided that, since neither one of us had ever done this route, we might as well give it a go.

Despite the fact that I had been climbing much more than usual for the past few weeks, I was "sketchy" as I led up the first pitch. In my customary fashion, I placed several pieces of gear—a small Camalot right off the ground, an old hex just above. At the first 5.10 section, I placed a wire and a TCU. Higher, another wire and another TCU. As I reached a bulge, about twenty feet off the ground, I stepped up onto a face hold and placed a beautiful number 3.5 Camalot. I clipped the attached "hot wire" carabiner and was relieved to be to the hand crack. I pulled the bulge and continued up the crack. About five feet higher, I placed a number 3 Camalot, carefully clipping the color coordinated blue anodized Quicksilver "biner." Just above this, the crack pinched off with a horizontal dike—a frequent characteristic of Lovers Leap climbs. As I contemplated this move, I felt a little shaky, but I knew that I had protection at my knee, and once I pulled past this section, I would be on easier ground. While I was trying to decide if I should pull on the dike or crank from an insecure hand jam, I came off. I did, however, have time to warn my belayer. Tom braced for what he thought would be a short fall.

As I dropped, it seemed to me that the piece at my knee pulled rather easily. In apparent slow motion, I flipped upside down and rapidly approached the ground, head first and backwards. Finally, with an abrupt, yet springy halt, I stopped just short of the rocks and brush at the base of the wall. Just as the rope

pulled tight, the back of my head smacked against the granite, and blood shot out in abundance. I had an incredible rush of adrenaline and a hollow feeling in the pit of my stomach; I was shaking all over. Tom yelled, "Are you okay?" I quickly flipped onto my feet and realized that, other than the hole in my head, I was actually okay. I did, however, have some kind of strange sympathetic neck sensation, knowing that if I had gone six inches further, I would have snapped my neck.

I tried to untie from the harness, but the knot had pulled so tight I couldn't get it undone. Thomas volunteered to run down to the other climbers to get a knife. Before he left, he gave me his T-shirt to help slow the profusion of blood from my head. While Thomas was gone, I looked for my glasses that dropped during the fall. I saw them, but didn't retrieve them right away. I continued to fiddle with the knot; soon Thomas was back and we cut the rope. At this point, I walked over to the base of the climb, took out the first piece of gear I had placed, picked up the rack, looked up at the wall and noticed that, strangely, the rope was not running through the number 3 Camalot. Rather, it was five feet lower through the 3.5 Camalot. However, the higher number 3 Camalot, the piece that was at knee level when I fell, was still in place. Confused, I put on my glasses and continued down the trail.

I was feeling well enough where we opted not to drive to the hospital in Tahoe. Instead we headed towards home in Auburn. Within two hours of taking the fall, I was in a small office with a doctor and three nurses. They shaved part of my head, injected anesthetics and cleansers directly into the wound, and ultimately sewed me up with eight stitches, telling me the whole time how lucky I was. Meanwhile, I continued to replay the events of the morning in my mind, always wondering, how did the rope come unclipped from the blue carabiner?

Analysis

For the next several days, I hung around my house thinking about climbing. I spent a lot of time on the phone with friends who called to offer their condolences, express their happiness that I was okay, and ask what had happened. I decided that the following Tuesday I would return to Lovers Leap, pick up the gear that I had left, and go climbing to see how it felt to be out on the sharp end once again. After my fall, we had arranged with Brent and Steve, the two friendly climbers with the knife, to remove my gear from the climb and leave it at Strawberry Lodge for me to pick up later. When I walked into the lodge, the day manager, Mary, greeted us. As she handed me the gear, I was shocked to discover that the blue Quicksilver carabiner that had been clipped to the number 3 Camalot was actually broken in two. In over thirty years of climbing I had not seen or heard of a 'biner actually breaking in a "routine" fall; I was stunned. Climbing gear just doesn't break. When I later talked to both Steve and Brent they relayed how when Steve had rappelled the route to clean the gear, he was horrified to come to a Camalot with a broken 'biner hanging limply from the sling. The two climbers sat at the base of the climb pondering, "How did that guy break a carabiner?"

I am happy to report that I put the broken carabiner in the trunk, grabbed the rest of my gear, and we headed off for a great day of climbing at Lovers Leap. I did, of course, wear my helmet, and it was amazing the sense of comfort that I had.

I learned a great deal from this experience. First, it is my intention to always climb with a helmet. A beautiful, sunny day, as we've learned many times from all sorts of climbing literature, can quickly turn to tragedy. A helmet offers peace of mind and protection. Second, I've learned that gear does break. Just because the pro is at your knee and the wall is smooth and steep, doesn't mean that the system is fool proof. After hours of discussing this issue with friends—fellow climbers with literally hundreds of years of combined experience—we've concluded that there's not enough in the journals about the whiplash phenomena of carabiners. During the course of a fall, a carabiner can snap open. If during the instant that the gate is open, the climber's full weight comes on the 'biner, it can snap, as probably happened in my case. Rod Johnson, designer of the Bod Harness, modifier of the original Chouinard stopper, and five year employee of Chouinard Equipment analyzed the carabiner and said that it showed all the classic signs of being loaded with the gate open. After talking on the phone to Black Diamond's Quality Assurance Manager, Chris Harmston, I agreed to send him the broken binder and a few others of similar type and age. After testing and inspecting my gear, he also concluded that "the carabiner struck the rock during the impact of the fall and caused the gate to open due to whiplash." The odds of this are very slim, but it did happen to me.

Third, check the gate open strength of your carabiners. Common industry practice is to prominently display the open and closed KN rating of the carabiner. I am currently upgrading my carabiners to an open gate KN rating of, at least, nine. (A KN is a force or impact rating. One KN is approximately 225 lbs.)

Fourth, my experience also reconfirmed the fact that dogged insistence on anchoring the belay is essential. Tom was tethered to a tree, and it helped him stop me just in time. It also convinced me that placing a lot of protection is a good idea. For years when I have been climbing, I wonder, "what happens if this piece fails?" Well, now I know, it can happen, and it's good to have another piece not too far away.

Fifth, after ignoring or only half-heartedly understanding all the information about UIAA ratings and statistics, I have a vivid example of how a short fall near the ground can create a huge amount of force, because there is so little rope out to absorb the impact. I now carry some lightweight, locking carabiners on my rack to help stem the whiplash effect when leading difficult pitches near the ground. I have been told that a number of climbers have been doing this for years; I just never noticed the practice. Most of my new, replacement 'biners are the type with wire gates. They have a greater open gate test strength, and the wire gate is less prone to whiplash.

Finally, climbers, check your gear! (Source: Bart O'Brien)