WILDERNESS ROUTEFINDING • WALKING • TRAIL FINDING • SHARING THE WILDERNESS WITH ANIMALS • NEGOTIATING DIFFICULT TERRAIN • READY FOR THE WILDERNESS

CHAPTER 6

WILDERNESS TRAVEL

Climbing the mountain is one thing; getting from the trailhead to the mountain is another. Wilderness travel is the art of getting there—along trails, around brush, across rock, over snow, and across streams. If you learn the skills of wilderness travel, you open the gateway to the summits.

WILDERNESS ROUTEFINDING

Wilderness routefinding is the art of working out an efficient route from trailhead to summit that is within the abilities of the climbing party. Intuition and luck play a role, but it takes skill and experience to surmount the hazards and hurdles between the parking lot and the top. Aside from the orientation and navigation skills described in Chapter 5, Navigation, climbers rely on their ability to interpret trail, rock, snow, and weather conditions before and during the climb to skillfully travel over different types of terrain and to comprehend the clues that the wilderness offers.

GATHER ROUTE INFORMATION

The more information you gather ahead of time, the better your ability to make sound decisions later on. Take time to research the geology and climate of the

party's selected area, in addition to your specific objective. Each mountain range has its own peculiarities that affect routefinding and travel. For example, mountaineers familiar with the Canadian Rockies, accustomed to broad valleys and open forests, will need to learn new rules to contend with the heavily vegetated, narrow canyons of British Columbia's Coast Range. The Pacific Northwest mountaineer familiar with deep snow at 4,000 feet (1,200 meters) in June will discover drastically different June conditions in the California Sierra.

Guidebooks offer detailed climb descriptions, including information on the climbing route, the estimated time necessary to complete it, elevation gain, distance, and so forth. But be aware that guidebooks become outdated; one bad winter can completely alter an approach. Make sure to consult the latest edition, and take a look at two or three different guidebooks, if available. Publications that cover other aspects of the area—its skiing, hiking, geology, and history—may also have something to offer as the party plans its trip.

Check online resources for weather forecasts, snow conditions, and Forest Service and Park Service information. Check also for information from other climbers, on message boards or in other venues. Climbers who have made the trip can describe landmarks, hazards, and routefinding difficulties, and quite often these descriptions contain helpful photographs. As always, exercise judgment when using online sources.

Useful details are packed into maps of all sorts: Forest Service maps, road maps, aerial maps, climbers' sketch maps, and topographic maps. More and more maps and topographic materials, as with information in general, are becoming available online and are downloadable or printable to take with you.

For a trip into an area that is especially unfamiliar, you will need to prepare in more depth. This might include scouting into the area, making observations from vantage points, or studying oblique (taken at an angle) aerial photos. Forest Service or Park Service rangers can usually provide information on road and trail conditions. The most popular climbing areas may even have designated climbing rangers who are in the mountains regularly and can give informed and current reports. Google Earth (www.google.com/earth) provides invaluable three-dimensional views of maps from any chosen vantage point.

Some of the best route details come out of conversations with locals. The person pouring coffee in the local cafe may be a veteran climber of the area.

Ask about trails that do not appear on the maps, current snow conditions, and best places to ford streams.

Always consider the season and the amount of snowfall in a given year when preparing for a climb. Early in the season, avalanche danger may be high on steep slopes, especially if there is a heavy accumulation of snow from the winter before. Late in the season, or following a warm winter with low snowfall, a slope that is usually covered in snow may be exposed talus.

Finally, do not let outdated information ruin a trip. Check beforehand with the appropriate agencies about roads and trails, especially closures, and about climbing routes and regulations, permits, limitations on party size, and camping requirements.

LEARN FROM EXPERIENCE

There is no substitute for firsthand experience. As you learn, climb with seasoned mountaineers, watch their techniques, and ask questions. The more familiar you are with the wilderness, the greater your freedom to find your own way.

BE OBSERVANT ON THE APPROACH

Climb with your eyes. Continually study the mountain for climbing routes. A distant view can reveal patterns of ridges, cliffs, snowfields, and glaciers, as well as the degree of incline. At closer range, details of fault lines, bands of cliffs, and crevasse fields appear. Look for clues of routes: ridges with lower incline than the faces they divide; cracks, ledges, and chimneys leading up or across the faces; snowfields or glaciers offering easy or predictable pitches. Look for climbable sections and link them together visually. With experience comes a good eye for what you know you can climb.

If the approach skirts the base of the mountain, try to view the peak from various perspectives. Even moderate slopes can appear steep when you look at them head on. A system of ledges indistinguishable against background cliffs may show clearly from another angle or as shadows cross the mountain.

The presence of snow sometimes promises a modest angle and easy climbing, because snow does not last long on slopes of greater than 50 degrees. Snow and shrubs that appear on distant rock faces often turn out to be “sidewalks” with smaller ledges between. However, snow can be deceptive. What appear to be snowfields high on the mountain may be ice. Deep, high-

angle couloirs often retain snow or ice year-round, or stay icy late in the day, especially when shaded.

WATCH FOR HAZARDS

Stay alert to climbing hazards. Study snowfields and icefalls for avalanche danger and cliffs for signs of possible rockfall. Snowfields reveal recent rockfall by the appearance of dirty snow or rock-filled craters. If the route goes through avalanche and rockfall territory, travel in the cold hours of night or very early morning, before the sun melts the ice that bonds precariously perched boulders and ice towers. Move through such places quickly.

Take rest breaks before or after danger zones, and when you enter them, try not to get caught behind slower parties. If possible, avoid these areas in heavy rain. Also watch for changing weather conditions (see Chapter 28, Mountain Weather). Keep evaluating hazards and looking for the most appropriate route, given the conditions. If the route you initially planned on climbing begins to look questionable, search for alternatives and make decisions as early as possible.

THINK ABOUT THE RETURN

Always consider the descent while you are making the approach. What is easy going up is not necessarily easy going down; nor is it easy to find. Look back frequently, take notes, take GPS and altimeter readings, and, if necessary, mark the route. (For additional information, see Chapters 5, Navigation; 7, Leave No Trace; and 16, Snow Travel and Climbing.)

The approach is also a time to look ahead to the end of the day. Consider where the party has to be by dark and whether the area will be safe to travel through by headlamp, if necessary. Keep an eye out for emergency campsites, water supplies, and anything else that may make the return trip easier and safer. Notice how long it took you to travel in to estimate how long it might take to return. If you have not already done so as you planned the trip, establish a "turnaround time"—that is, the time you will need to begin your return whether or not you have achieved your objective. Share that information with others on the trip so that they can also plan and understand the expectations for the outing.

WALKING

Reaching the summit often involves more walking than climbing. Walking is as important a skill as any other that climbers learn. Before hitting the trail, stretch your legs, hips, back, and shoulders. Drink some water. Consider taping or putting Moleskin on areas prone to blisters. Take time to adjust your pack and boots to avoid aches and pains—and frequent stops—later on.

Prepare for stops before you start out on the approach. Use your pack's outside pockets for items that you will need repeatedly throughout the day, such as snacks, water, jacket, hat, gloves, gaiters, sunglasses, and headlamp. Not only will it be easy for you to reach these items but other members of the party can also reach them for you if necessary, without your needing to remove your pack or even reduce the pace. Strap your ice axe and trekking poles to the outside of your pack so they are readily available for rough terrain. The ice axe will often be very useful even before snow line.

PACE

Setting the right pace from the start ensures a happier, stronger day of climbing. The most common mistake is walking too fast to begin with. This may perhaps be done out of concern for the long miles ahead or from a desire to perform well with companions. But why get worn out on the first mile of a 10-mile (16-kilometer) approach if the whole day is available? You are going too fast if you cannot sustain your pace hour after hour or if you cannot converse without losing your breath. Take your time and enjoy yourself (see the "Hiking with a Group" sidebar).

The other mistake is walking too slowly, which prolongs the hike and leaves less time to negotiate the more technical portions of the trip. If you are walking slowly due to fatigue, remember that the body has considerable reserves. Muscles may ache but still have many miles left in them. A degree of discomfort is inevitable; walking too fast or too slow only creates additional fatigue.

At the start, walk slowly to allow your body to warm up. Before you start to sweat, take a break and remove some clothing. Then increase the pace and accept the pain as your body works harder to experience its second wind. Physiologically, your heartbeat and circulation increase and muscles loosen. As endorphins kick in and the feelings of physical stress subside, you feel strong and happy.

HIKING WITH A GROUP

Walking with others involves certain considerations that help make travel more efficient and enjoyable:

- **Set a pace that makes good time but does not burn out slower climbers.** Adjust the party's pace so that slower climbers do not fall far behind. Do not allow anyone to travel alone, either last or first. Give the last person time to catch up with the party at rest stops—and time to rest once that person gets there.
- **Try putting the slowest person in front to set the pace.** This helps keep the group together and may motivate a slow hiker to set a faster pace.
- **Redistribute group gear to energetic people.**
- **Stay three to five paces behind the person ahead.** Give the climber —as well as that person's ice axe or trekking poles—some space.
- **Stay close to the group.** Do not lose contact with other hikers or make them continually wait for you or wonder how far ahead you are.
- **Step off the trail when you stop.** Don't block the trail for others.
- **Ask permission to pass**, and pick a good spot to do so.
- **Mind the person behind you when you grab branches.** Before releasing branches, look back and call out "Branch."
- **Be courteous when meeting an oncoming party.** Traditionally, the party heading downhill steps aside to let the ascending climbers continue upward without breaking pace. However, if the terrain is steep or if the descending party is larger, the climbers moving uphill may step aside and take a few breaths. Generally, stand on the uphill side of the trail to let others past. However, when a party meets pack animals, it is often expected that those on foot will move aside and stand on the downhill side of the trail; speak quietly and make no sudden movements. People on mountain bikes should always yield to those on foot.
- **Select gathering points for the party during long approaches and descents where routefinding is not a concern.** This allows party members to find their natural pace within smaller groups. Regroup at trail junctions and difficult stream crossings. Ask the most experienced members to take front and rear positions.
- **Be cheerful and helpful.** Be someone you would want to hike with.

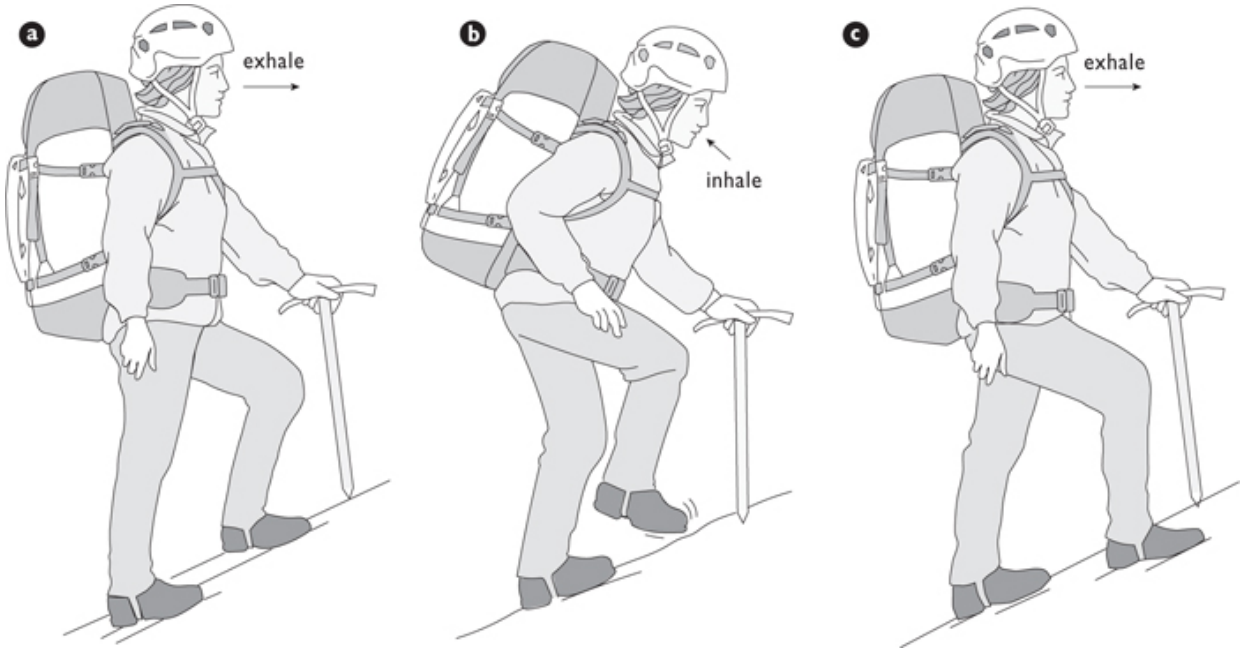

Fig. 6-1. The rest step: a, stand with entire body weight on right leg and exhale, completely relaxing left leg; b, inhale and step forward with right leg, shifting weight to left leg; c, place entire body weight on left leg and exhale, completely relaxing right leg.

Vary the pace depending on the trail. Plod slowly and methodically up steep hills. As the grade lessens, pick up the tempo. Eventually you will find a natural pace that adapts to pack weight, terrain, weather, and other conditions. The pace will inevitably slow late in the day as fatigue sets in. Adrenaline may fuel short bursts of exertion, but there is no "third wind."

THE REST STEP

Slow and steady is a pace that gains the summit. On steep slopes, in snow, and at high altitudes, the rest step controls your pace and reduces fatigue. Use this technique instead of frequent rest stops whenever legs or lungs need to recuperate. The rest step is simple but subtle; practice it.

The essence of the technique is to end every step with a momentary but complete stop, giving your leg muscles a rest. Swing one foot forward for the next step. Stand upright and exhale while letting your rear leg support your entire body weight (fig. 6-1a). Straighten your rear leg so that you are supported by bone, not muscle. Feel the weight sink into your bones and foot. Now completely relax and soften the muscles of your forward leg, especially the thigh. This momentary rest, no matter how brief, refreshes the muscles. The momentary rest also tends to make your foot placement more secure. Then

take a breath and swing your rear foot forward for the next step (fig. 6-1b), and repeat the rest step for your other leg (fig. 6-1c).

Synchronize breathing with leg movements. Typically, take a new breath with each step. Inhale and take a step up; exhale while pausing and letting your front leg rest as your rear leg supports your weight. Keep repeating the sequence. Many experienced climbers find a tune they replay in their head to help them keep a comfortable rhythm. The number of breaths per step depends on the difficulty of the work and your level of fatigue. At high altitudes, climbers sometimes take three or four deep breaths before each step up.

The rest step requires patience. For some, the monotony of the pace can undermine morale, especially when you are following another climber up a snowfield and there is no routefinding or step kicking to occupy your thoughts. But focus on the rhythm or hum a tune in your head (settle on an upbeat tune if that helps). Trust the technique to chew up the miles, even though the summit may seem so far away.

RESTS

Rests allow your body to recover from strenuous activity and to maintain an efficient pace. Take rests only when necessary; otherwise, keep moving. Numerous unnecessary stops can turn a 10-hour day into a 15-hour day, affecting group morale or even the team's chance of reaching a summit.

During the first half hour, stop to allow the group to readjust bootlaces and pack straps, add or take off layers of clothing, stretch warmed-up muscles, et cetera. Take short breathers—once every one to one and a half hours—during the early part of the day, while bodies are fresh. Rest in a standing or semireclining position, leaning against a tree or hillside to remove pack weight from your shoulders. Take deep breaths, and have a bite to eat and something to drink. Stay hydrated—always drink at every stop.

Remember to declare regular party separations (toilet stops), especially out of courtesy to the person who may be too shy to express the need. However, in order to minimize your impact on the mountains, your first toilet stop should be at the last available restroom facility found at or before the trailhead.

Later in the day, feelings of fatigue may demand more thorough relaxation, and the party can take a full rest every two hours or so. Look for a place with advantages, such as water or convenient slopes for removing packs and enjoying a view. Stretch muscles and put on additional clothing to avoid

stiffness and chilling. Remove extra clothing before starting out again in order to prevent another stop a few minutes down the trail.

Also, take care that you do not waste unnecessary time during each stop. To help prevent a stop from taking up too much time, clearly establish how long that stop will last when you begin the break. Then adhere to your plan, unless there's a reason to change.

DOWNHILL

Walking downhill is a mixed blessing. The pace quickens without increasing fatigue; however, climbers may feel pain long after the day is over. When you walk downhill, your body and pack weight drop abruptly on your legs, knees, and feet. Toes jam forward. Jolts travel up your spine and jar your entire body. Avoid a host of injuries—including blisters, knee cartilage damage, sore toes, blackened toenails, headaches, and back pain—just by using a few of the following tricks:

- Trim toenails close before starting out.
- Tighten laces—especially on the upper part of the boots—to reduce foot movement inside the boots and avoid jamming toes.
- Bend the knees with each step to cushion the shock. As dancers like to say, "Remember your plié."
- Place each foot lightly, as if it were already sore.
- Use ski or trekking poles to reduce the load on the knees and to provide additional stability.
- Maintain a measured pace that is slower than the one urged by gravity.
- Use an ice axe for balance or for braking when necessary. The ice axe is not just for snow. It is also helpful in steep meadow, forest, and heather. (To learn ice-axe techniques, see Chapter 16, Snow Travel and Climbing.)
- Find a place to sit briefly every 45 to 60 minutes, to reduce fatigue on the knees if necessary.

SIDEHILL

The ups and downs of climbing are far preferable to the torments of cross-country sidehilling (traversing). Walking across the side of a slope twists your ankles, contorts your hips, and undermines balance. If possible, hike straight up, abandon a sidehill, drop down into a brush-free valley, or go up onto a rounded ridge. If traversing is unavoidable, look for rocks, animal trails, and

the ground just above clumps of grass or heather to provide flat spots of relief. Switchback regularly to avoid ankle strain in one leg.

UPHILL

As you climb uphill, in addition to watching for specific hazards, continue to monitor the steepness and general nature of what you are climbing into. Consider whether continuing will lead you into territory so steep and technical that you will have difficulty downclimbing or otherwise retreating. If you begin to notice that you might have difficulty retreating, especially if there is any chance you are not on the trail you intended to follow, take time to confirm that you are on route and that you do not have other options. Otherwise, retreating while you still feel comfortable with the terrain is likely the best option.

TRAIL FINDING

For a wilderness traveler, a "trail" is any visible route—no matter how ragged—that efficiently gets the party where they want to go. The goal is to find the easiest route using the tools at hand: awareness of the terrain, navigational skills, weather conditions, and tips from guidebooks and experts.

Even in popular areas with heavy foot traffic and signage, keep alert to find and stay on the trail. Missing a turnoff is easy if a sign is gone or if logging, erosion, an avalanche, treefall, or rockfall obliterates the trail. On an established forest trail in deep snow or through a lot of woody debris, saw-cut log ends peeking through may be the only indication of a trail's location.

Old blazes cut in tree trunks, or surveyors' ribbon tied to branches, often mark the trail through a forest. Rock cairns (piles of rocks placed along the route as markers where the path is not obvious) may show the way above timberline. These pointers may be unreliable. A tiny cairn or a wisp of ribbon may indicate nothing more than a lost climber, a route to an alternate destination, or an old route since obstructed by rockfall. Navigation tools like the compass may stand you in good stead too (see Chapter 5, Navigation).

The trick, however, is to stay on the trail until the inevitable moment it disappears or until it becomes necessary to head off trail in order to go in the right direction. Choose a course that a trail would follow if there were a trail. Trail builders look for the easiest way to go. Do as they do.

SHARING THE WILDERNESS WITH ANIMALS

Alpine wildlife is fascinating and often charming, but enjoy the birds and animals from a distance and do not disturb them. When you encounter animals on the route, move slowly and allow them plenty of time to drift away. Try to pass on their downhill side; typically they head uphill to escape. Give them plenty of room. An animal rushing from a close encounter with a human is in danger of stress or injury; if it has too many of these encounters, it may feel forced to abandon its home grounds for poorer terrain.

BEARS AND COUGARS

In bear country, stay out of the "personal space" of bears. Try not to surprise them. Whenever possible go around brushy ravines with poor visibility rather than through them, even if it makes the route considerably longer. Make plenty of noise in unavoidable lower-visibility areas to warn animals of your approach.

If the climbing party surprises a bear or cougar, do not turn and run. Running may elicit a chase response in large predators, and bears and cougars are very fast runners. Instead, stand your ground, face the animal, talk, and slowly edge away while still facing the animal. (See Resources for more about handling animal encounters.)

NEGOTIATING DIFFICULT TERRAIN

The biggest barriers on the way to a mountaintop often appear below the snow line.

BRUSH

Brush thrives in younger forests or in low-altitude, wet, subalpine areas that have few trees. A river that frequently changes course prevents large-tree growth and permits brush to thrive. In gullies swept by winter avalanches, the shrubs simply bend undamaged under the snow and flourish in spring and summer.

Brush can be a backcountry horror, and "bushwhacking" makes for difficult, dangerous travel. Downward-slanting vine maple and slide alder are slippery. Brush obscures the peril of cliffs, boulders, and ravines. Brush snares ropes and ice-axe picks. The best policy is to avoid brush, but if that is not possible,

try the following techniques (see also the "Tips to Minimize Brush Hassles" sidebar):

- **Use trails as much as possible.** Five miles (8 kilometers) of trail may be less work and take less time than 1 mile (1.6 kilometers) of brush.
- **Travel when snow covers brush.** Some valleys make for easy going in the spring when it is possible to walk on snow, but they are almost impossible in summer when it is necessary to burrow through the brush.
- **Avoid avalanche tracks.** When you are climbing a valley wall, stay in the trees between avalanche tracks to avoid the brush.
- **Aim for the big trees, where brush is thinner.** Mature forests block sunlight and stifle brush growth.
- **Travel on talus, scree, or snow remnants** rather than in adjacent thickets.
- **Look for game trails.** Animals generally follow the path of least resistance. Use these trails but take care not to startle large animals in heavy brush.
- **Travel on ridges and ridge spurs,** which may be dry and brushless, whereas creek bottoms and valley floors are often choked with vegetation.
- **Scout both sides of a stream** for the route with the least amount of bushwhacking.
- **Consider going into the stream channel** if the route parallels a stream. Wading may be necessary, but the streambed can be an easier tunnel through the brush. Dry streambeds are often ideal. Take care in deep canyons, where waterfalls and fallen trees interrupt a stream.
- **Take a high route.** Climb directly to timberline or a ridgetop.
- **Go up to the base of side bluffs,** where there is often an open, flattened corridor next to the rock.

TALUS, SCREE, AND BOULDERS

Mountain peaks constantly crumble, dropping rock fragments that pile up below as talus, scree, and boulders. Most of the rubble pours from gullies and spreads out in alluvial fans that often merge into one another, forming a broad band of broken rock between valley greenery and the peaks. These fans can alternate in vertical strips with forest. Talus consists of larger fragments, usually big enough to step on individually. Scree is smaller—from the size of

coarse sand up to a couple inches across—and may flow a bit around your feet when you step on it. When even larger rocks fall off cliff faces, they form boulder fields. Slopes of talus, scree, and boulders can either help or hinder a climber. Most offer handy, brush-free pathways to the mountains, but some are loose and dangerous, with sharp-edged rock that can cause injury.

Talus. Talus slopes build gradually over the ages, and on the oldest slopes, soil fills the spaces between the rocks, locking them together to create smooth pathways. But talus can be loose on volcanoes and younger mountains, where vegetation has not filled in the spaces. Even large rocks can roll or teeter. Try for a route where the rock is lichen covered, which indicates that the rock has remained in place for a long time. Move nimbly on talus, ready to leap away if a rock shifts underfoot. Use your eyes and plan four or five steps ahead. Try to set your foot smoothly and flex your foot to accommodate the angle of the surface you are stepping on. That may help the piece remain stable. Take care on wet talus.

TIPS TO MINIMIZE BRUSH HASSLES

Some skirmishes with brush are inevitable; here are some tips for dealing with it:

- Choose the shortest route across the brushy area.
- Look for animal trails through the brush.
- Use fallen trees with long, straight trunks as elevated walkways.
- Push and pull the bushes apart, sometimes by stepping on lower limbs and lifting and clinging to higher ones, to make a passageway.
- Use hardy shrubs as hand- and footholds on steep terrain.

Scree. Loose scree can make going uphill a slow-motion torment, with part of each step lost as your foot settles in. Stepping on or just above a larger rock in scree can pry or wedge it out. However, descents can be fun. It may be possible to move down the scree in a sliding stride—something like cross-country skiing or plunge-stepping down snow. Ice axes are helpful; the technique on scree is similar to that on snow (see Chapter 16, Snow Travel and Climbing). Nonetheless, be aware that scree can sometimes consist of only a thin, ball bearing–sized cover over large rocks. If there is vegetation on the slope, avoid setting off scree slides that can damage the plants. Although riding a scree slope can be fun, bits of rock can work their way into your

boots and cause discomfort when you reach talus or a downward trail. You could wear short, lightweight gaiters in the summer if you expect to encounter scree.

Boulders. Boulder fields can be pleasant alternatives to torturous scree slopes, but they have their own dangers. Normally, fallen boulders form a steep slope beneath the cliff they detached from—the steepest slope that such boulders can pile up on is called the *angle of repose*. The boulders landing on even steeper slopes tend to fall off unless stabilized by vegetation. The most commonly traveled routes up boulder fields are usually quite stable, since foot traffic has gradually shifted the riskiest boulders to more stable places. Beware the unfrequented boulder field—where there are no boot marks on the boulder moss, for instance.

Rockfall

Sometimes the route ascends a steep gully filled with a mix of boulders embedded in talus and scree—this is a classic scenario for party-induced rockfall. Disturbing one key stone on a glacial moraine or a talus slope can set off a rock avalanche. Safety dictates traveling outside the fall line of climbers above and below you if possible. If you are in a narrow gully where this is not possible, tread gently and be ready to loudly shout "*Rock! Rock! Rock!*" if a stone dislodges. Keep the party close together so a rock set off by one climber cannot gain dangerous momentum before reaching others (fig. 6-2a). Consider permitting just one climber (or small groups keeping closely together) to move at a time while the rest of the party remains in protected spots (fig. 6-2b).

Party-induced rockfall is by no means the only hazard of loose gullies. Even rainfall can set off rockfall. Other times, rockfall may be set off by another climbing party out of your party's sight. Overall, rockfall is one of the most common causes of mountain accidents, so beware! Consider wearing a helmet any time you are traveling over terrain where a climber may be exposed to rockfall from above or could have a serious fall.

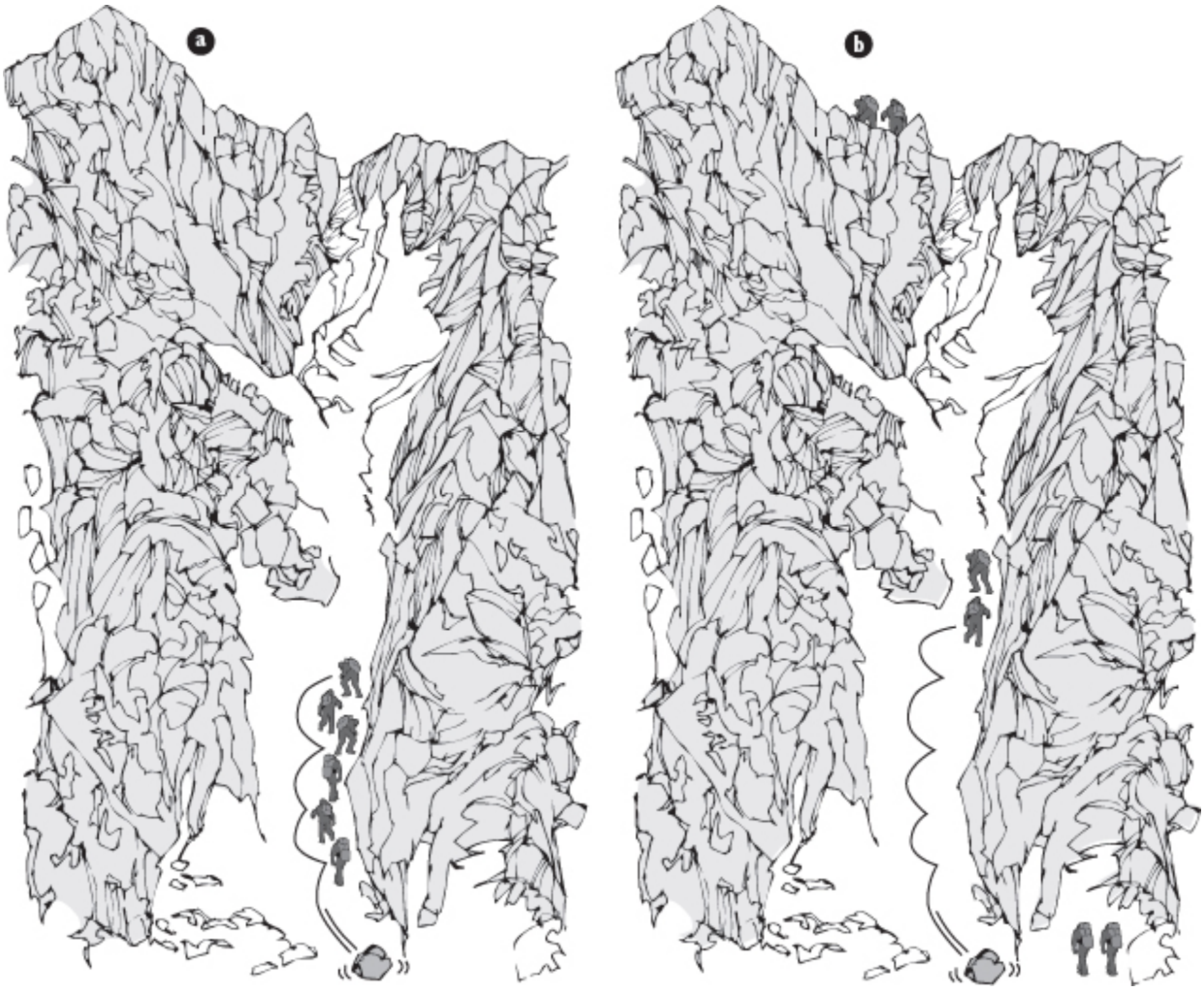

Fig. 6-2. Traveling safely on loose rock: a, climbers stay close together so that a dislodged rock does not gain dangerous momentum before reaching the climbers below; b, climbers ascend in pairs or small groups out of one another's fall line, so a dislodged rock passes the climbers below.

Descending

Facing exposure while descending talus, scree, or boulders can be intimidating. Climbers may hesitate or move slowly. This can be dangerous. Move in short, smooth, quick steps, and know where the next step is, so you are ready to quickly get off a moving rock and avoid injury. Trekking poles or an ice axe are helpful; keep your pole or axe in front of you to avoid it becoming caught between rocks or disturbing rocks above you.

SNOW

Snow can be very helpful for wilderness travel. Many peaks are best climbed early in the season when consolidated snow covers talus, brush, and logging slash and when snow bridges provide easy access over streams. However, in a different season or with less-than-ideal snow conditions, snow can be a curse. Trails are lost under snow or are washed out by avalanche or heavy thaw. Thin snow is unstable and may obscure dangerous conditions. Watch for terrain traps if spring avalanches are a possibility (see Chapter 16, Snow Travel and Climbing). A party may encounter different snow conditions on the approach, the climb, and the descent, given the time of day, the pace, or changing weather conditions. Be sure to study weather and snow conditions before the climb.

If traveling on snow, watch for visible terrain features, because they may indicate thin or melting snow. The snow next to logs and boulders often covers holes and soft spots called *moats*, which occur when the snow partially melts away from the wood and the rock. A moat is common around trees where lower limbs keep the snow from filling in next to the trunk (in this situation called a *tree well*). Probe with an ice axe to avoid likely trouble spots, step wide off logs and rocks, and stay away from treetops poking above the snow. If the snow is thin on a talus slope, there can be large voids under the snow that are easy to punch through. Especially if the day is warm, go slow on talus on the return trip if the snow is thin.

Streams will melt the underside of a snow bridge until it can no longer support your weight. To guard against a dunking (or worse), watch for depressions in the snow and variations in color or texture, and listen for sounds of running water. Water emerging at the foot of a snowfield indicates the existence, and perhaps the size, of a cavity beneath the snow. Probe for thin spots with your ice axe.

With experience, you will recognize both the advantages and dangers of snow and learn to use the medium to make wilderness travel easier and more enjoyable. See Chapters 16, Snow Travel and Climbing, and 27, The Cycle of Snow, for more information.

RIVERS AND STREAMS

When your objective lies on the far side of a sizable river or stream, crossing it is a major factor in route selection. Crossings can consume huge amounts of time and energy, and they can be the most dangerous part of the trip.

Finding the Crossing

Try to get a distant, overall view of the river and scope out crossing possibilities. This can be more useful than a hundred close looks from the riverbank. When a distant view is impossible or unhelpful, the party may have to choose between either thrashing through the river-bottom brush to find a way across or traversing the slopes high above the river in hopes of a sure crossing.

The surrounding landscape indicates the options. In a deep forest, there is a good chance of finding easy passage on a large log or logjam, even over wide rivers. Higher in the mountains, foot logs are harder to come by, especially if the river frequently changes course and prevents the growth of large trees near its channel.

If it is necessary to wade across, find the widest part of the river. The narrows may be the shortest way, but they are also the deepest, swiftest, and most dangerous. If snowmelt feeds a river, its flow is at a minimum in the early morning and might be a dangerous raging torrent in the afternoon. Sometimes a party may camp overnight to take advantage of this morning low water.

Making the Crossing

Unfasten the hip belt and sternum straps of your pack before you try any stream crossing that may require swimming in case of a fall. Make sure you will be able to remove your pack in a hurry.

Logs. A foot log is a great way across. If the log is thin, slippery, or steeply inclined, use a trekking pole (or poles), an ice axe, a sturdy stick, crampons, or a tightly stretched hand line (see below) to help with balance, traction, and support. Sit down and scoot across if that helps.

Boulder hopping. Boulders offer another way across. Before you cross, mentally rehearse the entire sequence of leaps. Safety lies in smooth and steady progress over stones that may be too slippery and unsteady for you to stop on for more than an instant. Use an ice axe or trekking pole(s) for additional balance. Avoid mossy or algae-covered stones if you can.

Wading. If you are wading, try to keep your gear, including your boots, dry. If the water is placid and the stones rounded, put your boots and socks in your pack while you wade across barefoot, or in sandals or lightweight tennis shoes brought for that purpose. In tougher conditions, wear your boots but put your socks and insoles in the pack; on the far side, drain your boots and

replace the dry insoles and socks. In deeper crossings, consider removing your pants or other clothing: loose clothing increases the drag from the water, but it also reduces chilling and may permit a longer crossing.

If you are trying to cross where the water is deep but not swift, cross with the least force against your body by angling downstream at about the same speed as the current. However, the best way to cross is to face upstream, lean into the current, and firmly plant an ice axe, trekking pole, or stout stick upstream for a third point of support. Use your leading foot to probe for solid placement on the shifting river bottom, advance your following foot, and thrust the axe or pole into a new position.

Swift water is easy to underestimate. With one false step, you can be pushed under and dashed against rocks and logs or sent bouncing along in white water. Water is dangerous whenever it boils above your knee. A swift stream flowing only shin deep can boil up against your knees. Knee-deep water may boil above your waist and give a disconcerting sensation of buoyancy. Frothy water, containing a great deal of air, is wet enough to drown you but may not be dense enough to float a human body. Streams fed by glaciers present an added difficulty because their bottoms are hidden by milky water from glacier-milled rock flour.

Team crossing. Two or more travelers can cross together, each in turn moving to a solid new stance while remaining secured to the other(s) by linked arms or hands. Team crossing with a pole is another method: Team members enter the water, each grasping the pole, which is held horizontal and parallel to the flow of the stream. The upstream member breaks the force of the current. Anyone who slips hangs onto the pole while the others keep the pole steady.

Hand lines. A hand line for small streams can be helpful. Angle the line downstream so that if any climbers lose their footing, they will be swept to shore. If a nylon climbing rope is the only option available, consider the rope stretch. Always use appropriate anchors (see Chapter 10, Belaying).

Using ropes for stream crossings in deep, swift water can be hazardous. If someone is belayed across the river, there is a possibility that the crossing person can be held by the belay but trapped underwater. Consider belaying the pack, however. That way, if a climber falls and sheds the pack, it will not get swept away.

Falling In

If you are swept downstream by a swift current, the safest position is on your back with your feet pointed downstream; use a backstroke to steer. This position vastly improves your chances for survival with minimal injuries. Be alert. If you approach a "strainer" (a small dam or collection of debris), switch quickly to normal headfirst swimming. Swim furiously to stay high in the water and get on top of the debris. The strainer may be your route ashore.

If falling off a log into the water seems imminent, try to fall off on the downstream side to avoid getting swept under the log. If a member of the party falls in, those on shore can try to reach out with a pole, ice axe, or branch. It may be possible to throw out a floating object, such as an inflated water bag. Make a realistic evaluation of the danger to yourself before you decide to go into the stream to attempt a hands-on rescue.

READY FOR THE WILDERNESS

Traveling in the wilderness is like wandering in a foreign country: The unfamiliarity of a place is the attraction, yet it also limits the journey. Preparation is essential, and nothing rivals the knowledge gained from personal experience.

Immerse yourself in the wilderness again and again; study it as if it were a new language. Use all five senses to master the "vocabulary" of the terrain. Some of your best moments will come when you discover your ability to respond well to what it asks of you. With fluency comes the freedom to roam, and with that freedom comes responsibility. The next chapter discusses ways to keep the wild places wild for those who travel after us, so they too can experience the exhilaration of discovery.