



## PART ONE

# SIMPLE ANCHORS

A simple anchor is a one-point anchor—a single nut, spring-loaded camming device (SLCD), sling, fixed piton, etc.—as opposed to combining single-point anchors into the solid matrix of a belay anchor. Because the foundation of all anchor matrixes rests with the simple *primary placements*, the importance of obtaining bombproof simple anchors cannot be overstated.

Appropriate gear, suitable cracks and adequate rock quality are necessary to obtain a solid anchor. Without all three, we're hosed. You might think the absence of good cracks would be the most dire, yet I recall a story from my friend and partner Richard Harrison that illustrates what can happen when the gear is lacking.

Richard and the late, great Nick Escrow were high on El Capitan when, moored at a hanging belay, Nick handed Richard a 1-inch nylon runner containing most all of their rack. To their horror, the knot on the sling came untied, and the entire rack dropped into the void. That left them with about eight nuts and assorted pegs filched from the bottom of the haul bag, and the very anchor from which they dangled. They also were able to clean a couple nearby fixed pins, but the last pitches were extremely touch-and-go as they leapfrogged along, sometimes able to climb but 50 feet before having to stop and belay in a weird and perilous spot, some-

times “anchored” and hauling from a single wired nut. Dreadful. By contrast, on Himalayan alpine routes, a team can have exactly the right gear and ample cracks, but owing to poor quality rock, security is but a dream.

To the layman glancing through the following chapters on the various protection devices, the whole lot may seem bewildering and complex. Yet the basic use of protection usually is straightforward and self-evident. Simply put, you select a section of crack, and place in that crack a protection device of corresponding size. The process is not terribly unlike working those wooden puzzles when we were kids and we stuck the big star into the big star-shaped hole. Since the size of the crack dictates what gear can be used, you instantly can eliminate all gear outside a specific size range. If you’re looking at a half-inch crack, you have only to consider options that can possibly fit that crack. Much more on this later.

In the absence of a crack, the rock might offer a suitable protruding or tunneling feature, or a luxuriant tree or bush. In these cases, an anchor may be secured by slinging the natural feature. Of course, an ever-increasing number of face routes have been equipped with bolts, and obtaining anchors on these fixed routes requires only clipping into the bolt hanger, negating the need to place any gear at all. But when the anchor involves hand-placing gear in a crack or rigging slings about natural features, the main goal is to obtain the strongest anchor possible from the given crack or feature.

**“Good-enough” anchors require:**

1. Suitable cracks
2. Adequate rock quality
3. Appropriate gear
4. Sound primary placements
5. Modern rigging techniques
6. Efficient construction and removal
7. Simple form and function
8. Strength and security throughout the system

# Natural Anchors

Natural anchors consist of anything that the environment provides—trees, blocks, horns of rock, etc. Many times a natural anchor is stronger than anything you could arrange with store-bought gear. Like any other anchor, there are numerous considerations that affect the strength of a natural anchor.

Of the many advantages of using sound natural anchors, three stand out. First, they are typically easy and fast to arrange. You might simply loop or girth a tree or a block (or whatever) with runners. Second, a slung natural anchor is often bombproof no matter the loading direction (multidirectional). Third, natural anchors are usually the least environmentally disruptive means of protection.

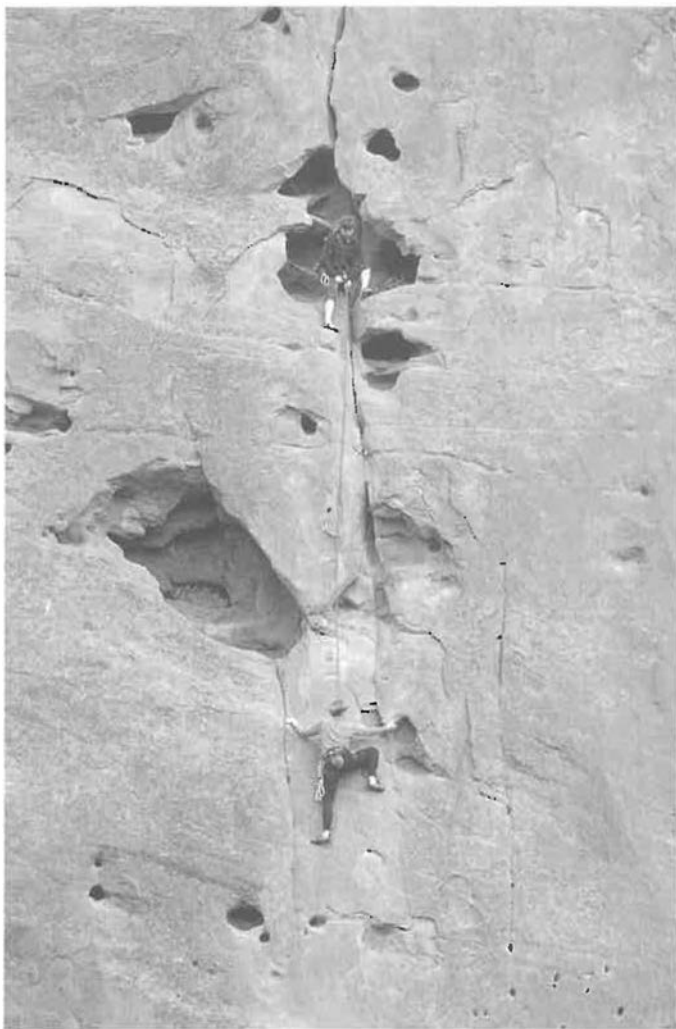
## **Natural Anchors are:**

1. Anything the environment provides—trees, blocks, horns of rock, etc.
2. Often more secure than gear-built anchors
3. Typically easy and fast to arrange
4. Multidirectional (can be loaded from any direction)
5. By and large environmentally friendly

## **TREES**

Anchoring to a 50-foot oak that casts a shadow like a thundercloud is pretty straightforward work. Judgment enters the game once the trees become smaller and are located on top of the cliff, on ledges and on shelves. I've seen some analyses of which trees are best suited for use as anchors; some of these go so far as to study the individual grain of the tree. But most of this—and everything else for that matter—basically boils down to common sense. Still there are several considerations worth noting.

Some climbers think anything with bark on it is bomber, and the infamous Tobin Sorrenson was one of them. It was at Granite Mountain—not the gem in Prescott,



Sharon Sadlier belays Heidi Benton on *Pete & Bob's*, Garden of the Gods, Colorado. PHOTO BY STEWART M. GREEN.

Arizona, but a scrappy little cliff outside Amboy, California, that has for years been closed to climbing. (An old rummy with a 12-gauge full of rock salt stands guard, in case you're wondering.) Tobin was leading up one of those greasy, teetering slabs that look like you could make good time up it in flip flops, when in fact your only hope is to keep your \$150 boots bicycling like Wile E. Coyote. When I clawed up to Tobin's belay and saw the anchor, I lost my mind.

"What the hell is that, Tobin?!"

"It's a tree. . . ."

I'd shot pool with a bigger "tree" than this one.

"That's not a tree, it's a twig. A dead twig." And it was sticking out of a clump of orange moss on an angled, shaly little foothold stance. I reached over and yanked the sad thing out with about ten pounds of heft.

"Jesus! You trying to kill us or something?!" Tobin cried.

The point is that what the tree is rooted in is probably more crucial than the breadth of the tree itself. Good-sized trees have pulled out; the big one atop the first pitch of a route called *Catchy*, at the Cookie Cliff in Yosemite, being a case in point. While there is likely no single and reliable way for a climber to know or test how well a tree is rooted, we're left to do a thorough inspection, including shaking the tree to check for movement. While some books have suggested various forestry strategies to establish the holding power of trees, no two trees are the same. I've personally hooked a tractor to a tree no thicker than my arm and only managed to break a chain in trying to yard out the implacable pine. I've also seen trees big around as a pickle barrel come totally uprooted after a thunder shower. Nevertheless we need a few provisional guidelines to help guide our choices.

First, you want a live tree, preferably 6 inches or more in diameter, not one that's been chopped or burned or is rotten. Any tree rooted in shallow soil, gravel, scree, moss or soot, or that's burgeoning from a slim crack, should be considered suspect. If you've no other choice for an anchor—or even if you have—test the tree with a solid shake. Boot it, try to rip it out. If it still feels sound, it probably is. Remember, of course, that a serious leader fall can generate much more impact force than a yank on the tree.

Whenever possible, tie the tree off with slings or a cordelette instead of looping the rope around the trunk. Once you get sap on a rope, it's like a bum rap or memories of love—you just can't shake it. Plus, the pivoting action common when leaning off the anchor can quickly abrade the sheath of a rope. Go with runners or a nylon cordelette.

Unless the tree is truly a whopper, tie it off as low as possible to reduce leverage. Never tie off a tree with a loop of biners. Girth-hitched runners or a cordelette are both popular methods (see photos and illustrations). A cordelette is longer than most slings, negating the need to girth-hitch two slings together to reach around the tree. Although arranging a girth-hitch to connect two slings is simple as rain, a recent rappelling accident in Arizona cost a wonderful young woman

### When anchoring to a tree . . .

- Make sure it is alive.
- Use slings or a cordelette instead of rope to tie it off.
- Tie it off as low as possible to reduce leverage.



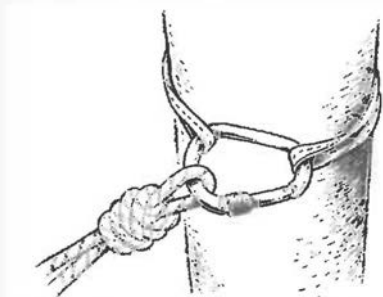
By tying this cordelette off with a figure eight, it essentially becomes redundant, with two loops around the tree. The doubled, power point clip-in helps prevent improper loading of the biner. In all such setups, try to keep the inside angle of the cord/sling less than 90 degrees to avoid load multiplication.

The downside of keeping the inside angle less than 90 degrees is that the longer slings add slack to the system, and unless the tie-in remains under tension (by the belayer leaning off the anchor), the sling(s) can migrate down the tree trunk—not necessarily a bad thing with this atomic bombproof anchor. However as a general practice, after you arrange protection/anchors, you don't want them to move—at all—till removal.

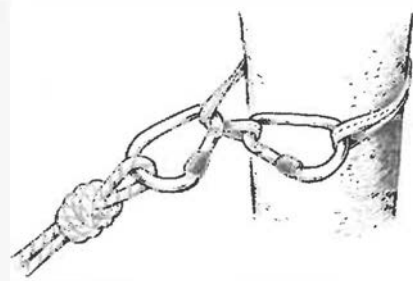
(an instructor with years of experience) her life when she apparently failed to properly girth-hitch two slings together prior to looping the anchor sling around a tree. As with any knot, even one as simple as the girth-hitch, check and double-check your work. And when slinging a tree, tie all knots and get the sling configuration squared away *before* you rig the tree, in order to visually verify all things are “mint.” For an extra bomber and redundant setup, and one without the load multiplication of the girth-hitch, rig the tree with two slings and two locking biners. There is no question this is a more secure setup, but most climbers go with the single sling girth-hitch, providing the sling(s) are in good shape and the tree is robust. As always, it's your call.

Trees are generally quite durable—to a point. At Great Falls and Carder Rock, both in the Washington, D.C., area, and at Coopers Rock, outside of Morgantown, West Virginia, trees are used almost exclusively as top rope anchors. Owing to soil compaction and wear and tear on the tree trunks, authorities have considered closing down sections of the cliffside. Climbers have responded by adopting gentler methods of anchoring off trees, such as using scraps of carpet to protect the bark.

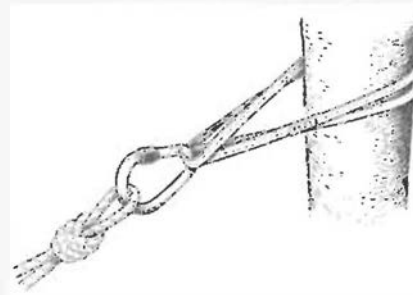
## Anchoring to a Tree



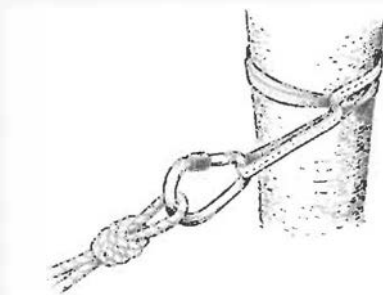
**Incorrect.** When pulled straight out on, this setup will stress the relatively weak gate of the carabiner.



**Slightly better,** but the sling is overly stressed



**Okay,** the sling configuration is strong, but the sling is loose and can easily slip around on the tree. Slide it down around the base for more security



**Okay.** The girth-hitch keeps the runner from slipping on the tree.

## SHRUBS AND BUSHES

Anyone who has tried to clear Grandma's backyard understands the hateful toil of uprooting healthy shrubs and bushes. Hence, they often make good anchors. As a general rule, it is easier and less time-consuming to rig a traditional anchor, providing one is readily available. But if good nuts are problematic to set, and a shrub, bush or sapling is at hand, consider using it.

Again, you want live stuff. Nothing brittle, charred, rotten or loose will do. And make sure the stuff is well-rooted. Most of the time a shrub or bush issues from a central root, and that's what you want to sling. Try to get the sling around that chubby root as near to the base as possible, and cinch it down snug. It is very sketchy to trust a solitary bush or shrub, and since they tend to grow in clumps, tying off to three or four (or more) and equalizing these anchors (to be explained later) is smart rigging. More times than not you'll have to ferret around and push sometimes-thorny limbs aside to get at the main root. Do so. Never settle for less than the best and least-leveraged tie-off you can manage. And always test the bush or shrub with a hearty yank. Unless you test it and test it good, you might be tying off something no more secure than a tumbleweed on a bridal path.

## BOULDERS AND BLOCKS

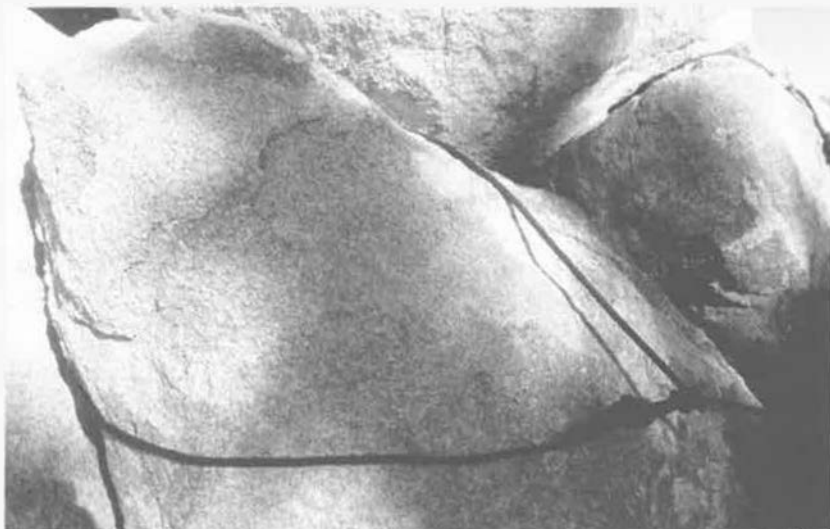
These can provide sound, quick anchors if several things check out, and you follow a few rules of thumb. First, realize that both boulders and blocks are not part of the body of the cliff. They are detached, and the only thing keeping them in place is their size, weight and position. For a boulder or block to be any good at all, it must be both sufficiently big and positioned in a way that it cannot be moved. It should not wiggle or budge at all. Anyone who has trundled boulders off a remote slab knows that a boulder big as a house can be sent on a path of mind-boggling destruction if it's on even the slightest grade. Following the first free ascent of the *Salathe Wall* in 1988, Todd Skinner and Paul Piana nearly died when a huge block they had slung (as an anchor) on the summit of El Capitan migrated several yards down toward the very brink. The duo were lucky to escape with one broken leg between them and a year of flashbacks.

### Remember . . .

- Only their mass and position keep boulders and blocks in place.
- To serve as secure anchors, boulders and blocks must be sufficiently large and totally immovable.

For a leader rigging a belay anchor, caution must be used when tying the climbing rope itself around huge blocks. Watch out for sharp edges and pinches that can severely damage your cord. For top rope setups, most professional guides use static rope when tying off huge boulders and blocks, since it is more abrasion resistant and less





This block is well situated, and is bomber for the direction of pull for which it is rigged. As always, appraising the integrity of a natural rock anchor involves judgment. Carefully examine for cracks in the block. And most importantly, how well is the block attached to the main rock structure? If you decide to use a detached block, how big is it: the size of your car or the size of your boom box? Does it rest on a flat platform or a sloping shelf? As a general rule, many climbers avoid rigging anchors off detached blocks and flakes.



This detached block is gigantic, roughly the size of an outhouse, but is precariously perched on a pedestal slim and angled. The crack between the block and the main wall will readily accept camming devices, but remember this: When you hear about catastrophic anchor failure, the number one cause is bad rock, where someone has committed to a single crack system in dubious rock, or perhaps a tragically loose flake or a detached block. Even the best placements are no better than the rock they are set in.

likely to jam in pinches than webbing. Static rope is also somewhat handier to work with and easier to knot, and it allows you to use a wider range of knots than would work with webbing or sling material. Sometimes the best way to use a block is to encircle the mass of it, tying it off like the ribbon on a birthday gift, instead of running the sling underneath it.

## HORNS

We use “horn” here to denote all kinds of protrusions that one might possibly sling for protection. The various kinds are many: flakes, horns, spikes, chickenheads, bosses, bollards, etc.

In this context flakes are simply fragments of rock that are partly or completely detached from the main wall. (Larger flakes might run an entire rope length, or



A quickdraw “thread” tied off directly with a runner. The thread is bomber, because the top of the knob is flush to the wall and the quickdraw cannot slip off. The rock would have to break for this anchor to fail. By hitching a runner directly through the quickdraw, you eliminate a link in the system—a biner. If this setup ever sustained a leader fall, however, the hitch on the runner would get cinched so tightly around the quickdraw you’d likely need a vice and a pair of needlenose pliers to work it loose. Ultimately the strength of this system hinges on the strength of the rock itself. Be careful about threads in desert rock. Entire knobs can pop under the slightest load. PHOTO BY KEVIN POWELL

## WHATEVER THE ROCK FEATURE . . .

Look out for sharp edges.

Test the security of the feature by thumping it with the heel of your hand. Anything that wiggles or sounds hollow is suspect.

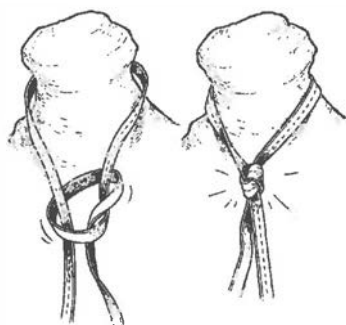
Look for surrounding cracks.

Tie off as close to the main wall as possible, to reduce leverage.

Tie off with runners, slip-knotting if the form is rounded.



The climbers who made the decision to rap from this flake were lucky they lived to drive home. The structure is completely detached and precariously perched. Structural integrity is paramount when using natural rock anchors, and this one lacks it altogether. This is like building your house on quicksand. Remember: Slings around an "anchor" do not vouchsafe their security.



Slinging a horn with a slipknot tied into a runner

longer.) Hence, it is the position of the flake that is our first concern. If the flake is pasted on a bald wall like a flapjack on a garage door, it's notably suspect. For a flake to be of any value as protection, it must be lodged in a manner that downward pull will only increase its security. Take the standard steps. Eyeball it. Is the quality of the rock okay? No matter how well the flake is lodged or jammed, if the rock is chossy, it may snap in half or crumble once loaded. Thump it carefully, then harder if it's secure. Check for sharp edges. If you decide to sling it, understand that even the best-looking flakes often are unpredictable.

Blocks present the same problems as flakes, with added danger since they are bigger. If you should topple one off, you've essentially sent mortar fire down the crag and possibly onto your belayer. And if you're tied into said block, you're probably going for the ride and the dreaded Dirt Nap. Position is crucial. Look for a block that is keyed into place by the surrounding rock—lodged in a bottleneck is best. Most loose blocks eventually slough off after a winter freeze, but for many years they can remain precariously perched, seemingly held by frozen cobwebs, ready to plummet down the cliff under tread of a piss ant.



Climbers at Joshua Tree toppling off an anchor set behind a loose block. It's no mystery where that block is going to tumble if it comes loose, and it's no mystery what the fate will be of anybody in its path. Although the block is conveniently situated for toppling this route, it is important never to let convenience cloud your better judgment—either find a better anchor or find a different route.

Spikes are pointed flakes or blocks that are usually, but not always, part of the main wall. On well-traveled routes, most of the loose rock has already been stripped away by previous parties, but don't bank on it. The first time I climbed El Cap, Ron Fawcett and I were traversing the Grey Bands on the Nose, a sketchy, nondescript section at mid-height where the rock is grainy gray diorite. I was belaying from slings, and as Ron came up, I noted a thick, 300-pound spike just above. It looked funky. I didn't know the numbers but figured the *Nose* had been climbed at least twenty times by then, so all the loose stuff must have been long gone. Not so. When Ron grabbed that spike, it pivoted straight down, and I still don't know why he and the spike didn't land in my lap. Who knows what kept it in place before we came along. The adage is: Never trust anything outright. Always assume it's poor, test it with caution, and only use it when you're convinced it's good. Guides at many trad areas report that many accidents are the result of beginners aggressively grabbing loose rock features without first cautiously testing them. Assume such features are poor, and avoid becoming a statistic.

A boss is a rounded spike or knob; a chickenhead is a knob that often resembles a protruding mushroom; and a bollard is a hummock of rock. The bigger they are, the more probable it is that they are sound—but not always. Depending on the shape of the knob, the hardest part might be figuring out how to tie it off. The more rounded, the less secure. The girth-hitch is usually helpful here.

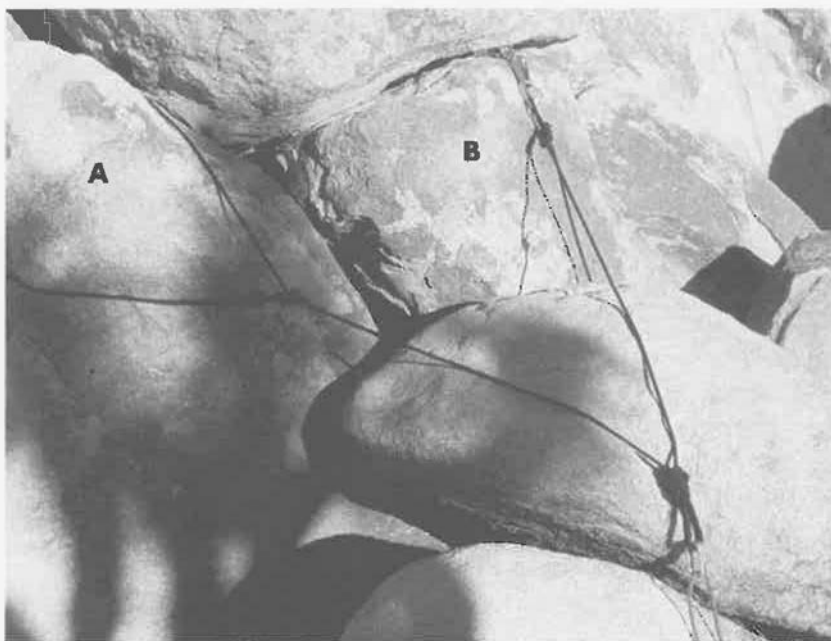
A chickenhead is as shady as a felon on bail. Approach it with wariness. They usually consist of a mineral or rock type that is more resistant to weathering than the underlying stone. Carefully



This marginal sling is slightly improved by setting a taper on the right to keep the sling in place. However, things look borderline on the left side. When a sling is simply draped over an edge like this, as opposed to being cinched tight with a girth or clove hitch, you want much more substantial purchase. Don't always expect to get it, however. Using the taper to shore up this placement has turned an unacceptable anchor into one that just might hold. But you wouldn't want to count on it. You're better off using the taper as an anchor, equalizing it with the sling. By loading it, you'd improve its ability to hold a sideways tug from the sling. PHOTO BY NEVIN POWELL.

inspect the base of all chickenheads because many are shot through with thin cracks. Thump them gently, then harder. I've had more than a few chickenheads come off in my hands, and several have popped the moment I stepped on them.

Recreational climbers rarely venture onto new or infrequently traveled routes, where the above considerations are particularly germane. As mentioned, most popular routes have long since had most of the loose rock booted away. But never count on it. It took almost forty years for a well-known rotten log to finally fall off the classic *Royal Arches* in Yosemite, and when that monster finally cut loose, it



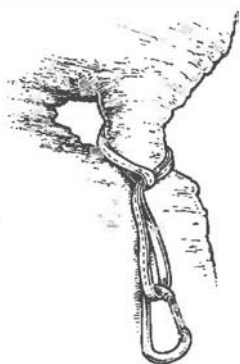
This TR rig consists of A) a natural rock bollard, and B) two camming devices in a horizontal crack. The anchor system is pre-equalized, featuring a static extension rope tied with a double-loop figure eight at the power point. The rope is attached with two oval carabiners, gates opposed and reversed.

Arranging a clean and simple anchor is sometimes tricky among such jumbled terrain. Here the climber decided where she wanted the power point and worked backward from there. The whole rig hangs nicely over the edge, and the use of the static rope is good for added abrasion resistance. The rock structure at A is beefy and well attached to the main rock structure. The two cams at B are solid placements, but if you scrutinize the structure, they are actually underneath a massive, detached block. The use of two oval carabiners opposed and reversed is adequate, but many climbing schools and outdoor programs use three oval carabiners, gates opposed and reversed, as their standard operating procedure.

must have been a sight. Ultimately common sense and a suspicious sense of judgment are your best weapons when dealing with all natural features.

## THREADING TUNNELS

When the rock weathers or cracks to form a hole in the main wall, climbers often can exploit the feature by threading a sling through the cavity. Common sense and sticking to the advice already laid down is key here. Is the feature strong? Thump it. Are there sharp edges? Is it cracked? And how big is it? Occasionally something as small as a suitcase handle can provide adequate protection. Anything less should be used cautiously, no matter how stout it appears.

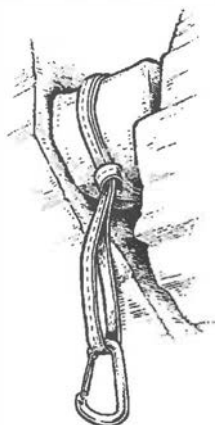


A tunnel girth-hitched with a runner.

## CHOCKSTONES

Any rock lodged inside a crack is a chockstone. You appraise the security of the chockstone just as you would that of a nut—does the stone's symmetry correspond to that of the slot? Is the stone set in a bottleneck or a constriction? Will downward loading decrease or increase its purchase? After considering these points, apply the same rules concerning horns, blocks, flakes, etc. Are there sharp edges? What is the quality of the rock? If all things look good, but the positioning is suspect, wiggle the stone around and secure a better seating if need be, *but be careful not to dislodge it*. This is a very real concern with bigger chockstones, and if the thing blows, it's *bombs away!*

Pay close attention to how you sling the chockstone. Often even the slightest tension can cause the chockstone to wobble or rotate inside the crack, and the sling can creep between the stone and the wall and get stuck—or sometimes even



A girth-hitched chockstone. Make sure the hitch is tight around the chockstone and pulled snug against itself so it won't slip if stressed

pass between the stone and the wall. Chockstones are infrequently used because they rarely meet the above requirements, and can be problematic even if they do. Getting them well slung is often the hardest part. Again the girth-hitch is usually the first option.

Though infrequent, some chockstones are clearly so bombproof that there's no budging them nohow. In these rare situations some guides girth-hitch the chockstone with a sling, jamming the sling's overhand knot between the main wall and the chockstone. The idea is to try to distribute any loading between the knot in the sling (which is acting like a nut) and the chockstone around which the sling is hitched. Though I've never see this technique used in the field, such is the improvisation common to all facets of anchor building.