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# Boots For Backpackers

The three most important considerations—  
COMFORT, COMFORT, COMFORT

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We all tell stories. All us grizzled back-country roamers who get wet and cold and call it fun do. We'll tell you about the snow that fell in the fire we lit with our last match. We'll tell you about the three-day rain on that Labor Day weekend when we forgot our ponchos. And we'll laugh. But we never laughed about sore feet!

Foot gear varies with the hike, the terrain and the weather. You alone know what your feet need. And you profit by knowing about leather and construction. You profit more by the knowing how to insure that the boots you buy fit you well.

## Fit

A hiking boot is a moderately rigid structure. You buy a boot in the hope that when it yields, it will approximate the shape of your foot.

The bootmaker shares your hope. He shapes the leather uppers of his boots over an idealized mold of the foot called a *last*. A last is more than just a smooth block of hardwood. It represents a statistically average foot shape based on a large number of feet.

These dimensions are constantly revised. Over the years, the average American foot has grown longer, wider at the ball, proportionately narrower at the heel, and larger in instep girth. The American last represents a composite of the American foot. Similarly, German and Italian lasts represent composites of German and Italian feet.

There are differences. European lasts are typically wider in the heel for any given ball and length. The instep girth is proportionately smaller.

You may have a foot that brings a smile to an American bootmaker. Or you may have a very American foot that doesn't fit any American last. One of our editors has a foot that is too big for an American size 9½-D, yet too small for a 10-C!

When shopping for a boot, begin by wearing two pairs of socks—a light pair next to your skin and a heavy pair over those. No boot will fit all parts of your foot perfectly. A small amount of rubbing is inevitable. But it's more desirable to have your outer sock rub against your inner sock than against your skin.

The type of sock you wear when you are fitted for boots should be the same kind that you wear when you hike in them. Alter the number of socks (some-

times even the brand of socks) and your boots won't fit the same. If you wear insoles, arch supports, or orthotic devices, wear them when you try on hiking boots.

The Brannock device measures your foot's overall length, ball-to-heel length and ball width. At the same time, it compensates for the way your foot spreads when you stand. The ball-to-heel length is most critical. The load-bearing area from your heel to the ball of your foot must have adequate support. You can approximate your proper size with a measuring device. But the most sensitive device is the feedback from your feet.

Slip the boot on your larger foot. Don't lace it. Wiggle your heel back into the heel cup. Now stand up and take a few steps. If the boot drops off your foot or feels like it wants to, the heel is too broad. Or the boot may be too wide in general. But if the ball width seems acceptable and the boot isn't excessively large, it means that the bootmaker's last is too wide for your heel. You'll never get a boot of *that particular model* to fit your foot well.

If the heel fits, slide your foot all the way forward in the unlaced boot until your toe is touching the toe box. Slip your index finger between your heel and the heel counter. Your finger should fit easily *but* with little or no slip. If you have to force your finger between the boot and your heel, the boot may be too short. If your finger won't fit at all, the boot is too short.

This method is controversial. Half sizes differ by only one-sixth of an inch. But the bone structure of your hand is proportional to the bone structure of your foot. What you are seeking is a useful first approximation. And the finger-fit method provides it.

With your heel placed well into the heel counter, determine whether the ball of your foot is where it should be in the boot. This is difficult to do by feel, unless the boot has a pronounced arch. An experienced outfitter can be a great help here. This is an important reason to buy your boots at a backpacking equipment specialty shop.

Another test for proper length is kicking the toe of the laced boot against the floor. This quickly—and painfully—tells you if the boot is too short. It can also indicate if the boot is too wide, the instep girth is too large, or the

tongue is inadequately padded.

Put on both boots and lace them firmly. Turn off your mind. Walk around the shop for 15 minutes. Listen to your feet. Sit down, relace the boots and turn your mind back on. The boots will have warmed up. And they will start to flex in the pattern preordained by their materials and construction methods.

Your foot should be in total—but gentle—contact with the boot along the length of the inner longitudinal arch (the inner edge of your foot). Your toes should lie normally without crowding. If your inner longitudinal arch is in contact with the boot and your toes are still crowded, the boot is too narrow. It will not break it. It may grow softer and more conforming. But it will still be too narrow.

Construction details can also make or break the fit of a boot. A heel counter that's badly formed or made of poor material makes a boot fit improperly. A toe box placed too far back causes the boot to break in the wrong place. Poor tongue design and inadequate tongue padding lets your foot slide forward in the boot as you walk. Ankle padding positioned incorrectly doesn't hold your heel in place. Low-grade insoles and mid-soles distort. Uppers made of poor leather stretch so much that your foot is poorly positioned laterally.

Boots that fit you well over a number of years begin with the proper last for your foot—and are made of materials that will retain their lasted form.

## Function

A boot needs to provide protection from the elements, lateral stability for the foot and a stable platform on which to walk. Most hikers wear too much boot.

In his 1906 classic, *Camping and Woodcraft*, Horace Kephart pointed out that "the importance of going lightly shod when one has to do much tramping is not appreciated by a novice." He noted what a one pound heavier boot on each foot can mean to the hiker. "In ten miles, there are 21,120 average paces. At one extra pound to the pace, the boots make you lift, in a ten-mile tramp, over ten tons more foot gear."

Consider boot weight before you buy. If several models fit you well, select the lightest that is durable enough for the terrain. Also consider flexibility. Kephart noted that "a flexible sole is a



prime desideratum for good walking." His injunction is as good today as it was in 1906. A stiff-soled boot is a *mountaineering* boot. A *hiking* boot needs a flexible sole. The sole must flex easily fore-and-aft as you walk. But it must be relatively stiff in torsion. This provides a firm platform when backpacking on uneven ground.

## Construction

Pay attention to the leather. A boot lives or dies on the quality of its leather.

Tanning is an important part of the multi-step process that converts cowhide into leather. Vegetable tanning (using plant by-products that contain tannic acid) produces a relatively stiff leather that holds its shape well. Chrome tanning (using soluble chromium salts) results in a pliable leather that dries soft. It's common to tan a hide with both processes in sequence, or to follow a chrome tan with a silicone dip or wax impregnation. Vegetable-tanned leathers are fatliquored with an oil to add flexibility.

Full hides are too thick for bootmaking. So they are split. The fur side of the hide (referred to as *top-grain*, *full-grain*, or *shell*) is dense and thick. The flesh side (called *split*) is comparatively soft and porous.

When the top-grain is lasted inside-out, it is called a *rough-out*. There is general agreement in the trade that top-grain leather is more suitable for heavy-duty use than split leather. But there is no consensus about rough-out leather versus smooth-out leather.

Advocates of the rough-out boot claim that the shell is better protected from abrasion when it's on the inside. And the rough surface, being more porous, absorbs waterproofing substances more readily than the shell. Smooth-out advocates claim that the shell absorbs far less moisture.

A smooth-out boot requires a hide that's free of range scars, blemishes and discolorations if it is to have a marketable appearance. High-quality leather is expensive. Add to this the premium paid for blemish-free hides, and you get prohibitively expensive boots. Soaring prices have virtually mandated rough-out construction.

This same price structure has forced many reputable manufacturers to use split leather in uppers. It's incontestable that top-grain leather is more water-repellent and more durable than split leather. However, many bootmakers contend that a thicker split of good quality, heavily waxed or oiled, will function as well as a full-grain. And outfitters and boot repairmen are quick to point out that boots fall apart because of poor maintenance and poor construction—not because the upper leather failed.

A well-made boot is far more than a catalog listing of buzz words. A Nor-

wegian welt is a means to an end, not an end in itself. A good boot is designed to minimize failure points, and is built to minimize failure at those points.

The longevity of a boot is a function of how well the upper is attached to the sole structure. This area is constantly flexed and often scuffed. It is generally damp, and almost always poorly maintained. There are many ways to fasten an upper to a sole, but only two have stood the test of time in the backcountry—inside-stitched and Norwegian welt construction.

The inside-stitched boot is built by turning the upper leather inwards, under the foot. It is stitched vertically through the insole and mid-sole with a Littleway, Blake, or McKay sewing machine.

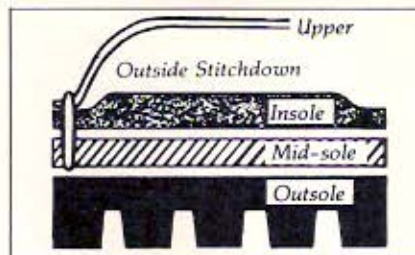
Inside-stitched construction offers the advantage of protecting the stitches from abrasion. It also enables the sole to be trimmed flush with the edge of the upper, or even undercut. This provides a more stable platform for walking by placing more of the hiker's weight under the foot. It's no accident that high-angle rock boots are inside-stitched.

The Norwegian welt is formed by turning the bottom edge of the upper outwards. It is stitched horizontally to the insole, then vertically to the mid-sole. The classic Norwegian welt makes use of a narrow strip of high-quality leather (the welt). The horizontal and vertical stitchlines are made through the welt before they pass through the upper.

The *feltshon*, a variation of the Norwegian welt, omits the welt strip. The upper is fastened horizontally to the insole, turned out and fastened vertically to the mid-sole. The welt itself offers a bit more protection against water. If the sewing machine tension is proper and the welt sufficiently thick, the stitchlines are buried in the welt to protect them from abrasion. Most bootmakers call both construction methods "Norwegian welt." And either variation is preferable to the other methods of fastening—Goodyear welt, stitch-down and cemented and injection-molded. Why?

The Goodyear welt is constructed by stitching a narrow strip of leather (the welt) horizontally to the insole then vertically through the rolled-over welt into the mid-sole. The welt itself is vulnerable. But the main drawback is that the upper is directly stitched only to the insole. And only the welt is stitched to the mid-sole. Failure of either one of the seams could result in the boot coming apart.

With the stitch-down construction, the bottom edge of the upper is rolled out and stitched vertically to the mid-sole. It's a flexible, lightweight method of joining an upper to a mid-sole. However, it exposes the stitchline to possible damage. The upper can separate from the mid-sole.



A cemented boot is built by folding the upper leather under a lightweight insole. The upper/insole unit is cemented to a one-piece rubber outsole. It is the cheapest, least durable form of boot construction.

The injection-molded boot makes use of molten neoprene to attach the leather upper to the sole. The uppers are molded directly to the outsole. Like cemented boots, injection-molded boots may fail on the trail. Both are better suited to walking the dog than hiking the Sierras.

Some ways of assembling the uppers have stood the test of time, too. Just as nature abhors a vacuum, the backcountry abhors seams in a boot. Rocks grab at them. Water rots them. Dirt lodges in them. Your heels rub against them. Logic dictates that the fewer seams in a boot, the longer it will last.

With few exceptions, the better boots are made with one-piece uppers joined at the heel. The seam is covered by a narrow protective strip called a backstay. The result is a well-protected seam.

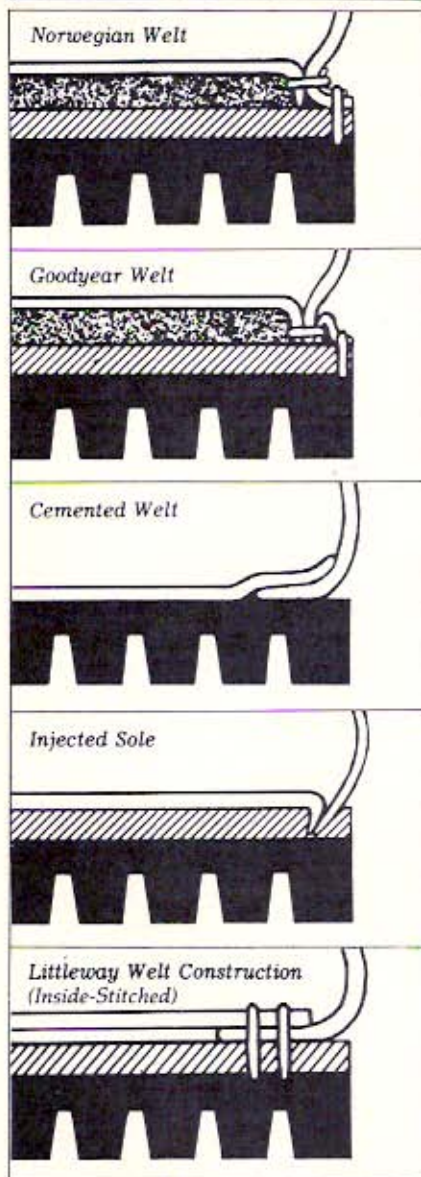
Most pieced uppers are found on cheap boots. The long tongue opening of the typical hiking boot makes it easy to cut a one-piece upper. Unless the bootmaker chooses either a smooth toe (with the laces extending only part of the way down the instep) or an integral, one-piece tongue covering. In either case, it may be geometrically impossible to cut the upper from one piece. The two halves of the pipe (the part of the boot around the ankle) might overlap when the pattern is laid out for cutting.

There are two common solutions. One is to piece the upper on the inboard part of the pipe. The other is to extend the scree collar down further on the inboard side of the pipe, or build a symmetrical scree collar that's deep enough to do away with the overlap.

The advantages of fit and comfort from a smooth toe are obvious, as are the advantages in protection offered by an integral, one-piece tongue. But few hiking boots are made with a smooth toe. Most use a lacing system that extends to the metatarsal arch. This enables the mountaineer to tighten and loosen the boot around the toe to accommodate different situations. But for the backpacker, it's hardly necessary.

Does this mean that the traditional hiking boot is less than desirable? No. It means that the backpacker must be able





to recognize design and construction elements that are rational and functional—and those that are meretricious.

These elements are most apparent in the closure system of a boot. A closure system must exclude rain, snow and dirt. It must permit the wearer to draw the laces up comfortably to provide a good fit. And it must be simple. The fewer seams and pieces the better.

A single tongue is simplicity. But it shifts position. And it leaks. Add gussets to the sides of the tongue and attach them securely to the upper, and you've gained some protection.

A double tongue system with an overlapping outer tongue and a gusseted interior tongue offers excellent protection. Remove the gussets from the inside tongue, and you're no better off than you'd be with a single tongue. Less well off. You've added cost, complexity and weight. And gained nothing.

Evaluate the entire boot for function. Are all those seams necessary? If so, are they sewn well and placed out of harm's

way? Is the boot made for use—or for display?

You can profit more by evaluating a boot as an exercise in functional design. Remember that the first function of a boot is to be walked in. And to be walked in with pleasure, it must first fit.

Back to square one!

## Breaking In

In the not-so-good old days, chiseling contractors ripped off pennies on Army foot gear by cutting the uppers a bit small. Troopers learned that soaking the boots in the nearest stream and walking them dry stretched the boot enough to insure a good fit.

A trick born of necessity became an article of faith. You'll still hear it said that soaking boots and walking them dry is the best way to break them in.

Break them *down* is more like it. New boots should be broken in by walking in them. Just don't take that injunction so seriously that you start off on a ten-miler the day after you bought them.

Wear your boots in the house. Wear them at work. Keep them protected from the elements until you're absolutely certain that they fit well. Then take them outside.

If you treat the breaking-in process as a pleasant game, it'll go faster and be more rewarding. New boots are the perfect excuse to investigate Nature Conservancy areas, abandoned railroad rights-of-way, tote roads, and even seldom-used dirt roads. Short trips are what you want when you're breaking in a new pair of boots.

## Boot Care

More boots are ruined by people than by trails. You can repair the wear and tear of hard usage. The ravages of poor maintenance are largely irreparable.

Proper maintenance starts by cleaning the mud from your boots. Wipe the interiors if they're wet, stuff the boots with crumpled newspaper and leave them in a cozy corner to dry. Avoid heat. Anything above normal room temperature isn't necessary. If the air feels hot to your hands, it's too hot for your boots.

The same injunction about heat holds true on the trail. Drying boots over a fire may result in burst seams, cracked welts and shrunken leather.

If your boots are not terribly wet, treat the lining with saddle soap. Treat the shell with a good waterproofing compound. When the boots are dry, rub in a little more waterproofing compound. Boot linings will serve you longer if you treat them with Lexol, a conditioning compound.

A shoe tree will maintain a boot's shape. So will ski boot carriers. Store the boots on an open shelf at normal household humidity and temperature.

# Evaluations

## How the Boots Were Rated

We asked American manufacturers and importers of the most widely distributed boots one question: Which one of your boots would you recommend for a week of backpacking in the Yosemite backcountry in August?

We rated the boots in three areas: fit, function and durability.

**Fit.** We rated the boots for last shape, toe and heel box placement, and ankle padding and placement.

**Function.** We rated the boots for flexibility, protection against water and dirt intrusion, padding, seam placement, and closure construction.

**Durability.** We rated the uppers and mid-sole and insole construction for materials, stitching, placement, and workmanship.

**Criteria Development.** The evaluation criteria and weighting values were developed for an earlier BACKPACKER boot evaluation. As a blind check, we asked several of the leading boot manufacturers to develop their own weighting values for evaluating boots. There was some variation in what the manufacturers considered important. But their average weighting values were remarkably close to what we had originally established.

A team of five evaluators examined the boots. Each one assigned scores on the 17 different evaluation criteria. Scores were then averaged and double-checked for consistency. There were some variations in scoring from one evaluator to the next. But there was unanimity on the comparative ranking of the boots.

Since we last evaluated boots, the market has changed considerably. Eleven of the boots in this evaluation are new to us. There are now better boots on the market than there were the last time around. Hence, some of the boots we rated before have earned slightly lower scores than in the past. These boots haven't deteriorated in quality. The standards have gone up; what once was best can now be topped. There are a lot of good boots in this year's crop!

### Rating System

- ★★★★ Excellent quality
- ★★★ High quality
- ★★ Good, efficient
- ★ Serviceable
- ★ Doubtful
- ✓✓✓ Excellent value
- ✓✓ Good value
- ✓ Average value



**Asolo  
Allegro**

★★★★✓✓

The Allegro is a finely-crafted general purpose backpacking boot. It has a top-grain rough-out upper, Littleway welt,



moderately stiff sole structure, and a Vibram lug sole. Mid-soles are laminated leather and rubber. There's a horizontal seam at ankle level on the in-board side of the boot. The uppers are joined with a narrow, well-shaped backstay. The Allegro is fully lined, and the pipe liner is joined to the vamp liner at the sides of the foot. There is no exposed seam at the backstay. Good heel fit is achieved without ankle padding.

And the last is generously sized at the ball of the foot. The padded single tongue is gusseted to the shell exterior. At 3 pounds, 14 ounces, the Allegro is a lot of boot in a light package. A good value even at \$92.50.

**Danner  
6490**

★★★★✓✓✓

This top-grain smooth-out boot has a flexible mid-sole structure of rubber and



leather. The top-grain lining covers the lace-hook rivets in the instep. The lining is butted at the heel. The backstay, folded over to form a loop at the back, exposes part of the seam that joins the

one-piece upper. The boot has an overlapping bellows tongue that is quite comfortable. The last seems somewhat wide in the heel. Uppers are fastened to the sole by stitchdown in the vamp; the heel is nailed. The boot has a Vibram lug sole. At 4 pounds, 8 ounces, the 6490 is a bit heavy for a soft but sturdy hiking boot. A lot of beautiful leather for \$76.50.

**Dunham  
6054**

★★

A fairly heavy, stiff-soled boot. The one-piece upper is a thick, oiled split leather. It is fastened to a cellulose insole



## Custom Boots— The Skive's The Limit!

If ever we wished the BACKPACKER rating system could register a score of more than five stars, this is the time.

These boots are custom boots—made-to-measure hiking footwear, with a number of options. Do you want a lighter weight upper? A stiffer mid-sole? The final product is limited only by the buyer's imagination and the bootmaker's ability.

The New World Boot is an inside-stitched smooth toe boot with a padded one-piece tongue and no scree collar. With the exception of a (necessarily) separate piece on the inside of the pipe, the upper is a single piece of full-grain rough-out.

The sample we looked at was (for us) an ideal combination of light weight and comfortably supportive stiffness. The base price is \$180, and the current wait is four to six months. John Calden, Hunkidori Bootmaking, P.O. Box 2523, Estes Park, CO 80517.

Of all the boots we've seen, one received consistently higher ratings and louder *aaahhh!*'s than any other: The Randal Merrell Hiking Boot. This inside-stitched boot is sensibly designed, and hand made with incredible attention to detail. And the

leather—particularly the one-piece, full-grain smooth-out upper—is gorgeous. When you understand that it is made by a western cowboy boot maker, you'll know why there is so much attention to detailing. Rumor has it that when other custom boot-makers have problem feet to fit, they

Randal I. Merrell Custom Boots, 228 South 1500 West, Vernal, UT 84078.

We should point out here that the famous Limmer Hiking Boot (the ready-made version of which is shown on page 67) is once again available on a custom-made basis.



Left: the New World Boots; Right: the Randal Merrell Hiking Boots.

refer the customer to Randy Merrell.

Of course, it should come as no surprise that this is an expensive boot: \$295! (Plus a \$35 fitting charge for first-time customers.) And you may be waiting upwards of eight months for the finished product.

The Limmer family temporarily ceased to accept orders because of a huge backlog of work. The current waiting time is nine to ten months. And the price is a tremendous bargain at only \$110. Peter Limmer & Sons, Intervale, NH 03845.