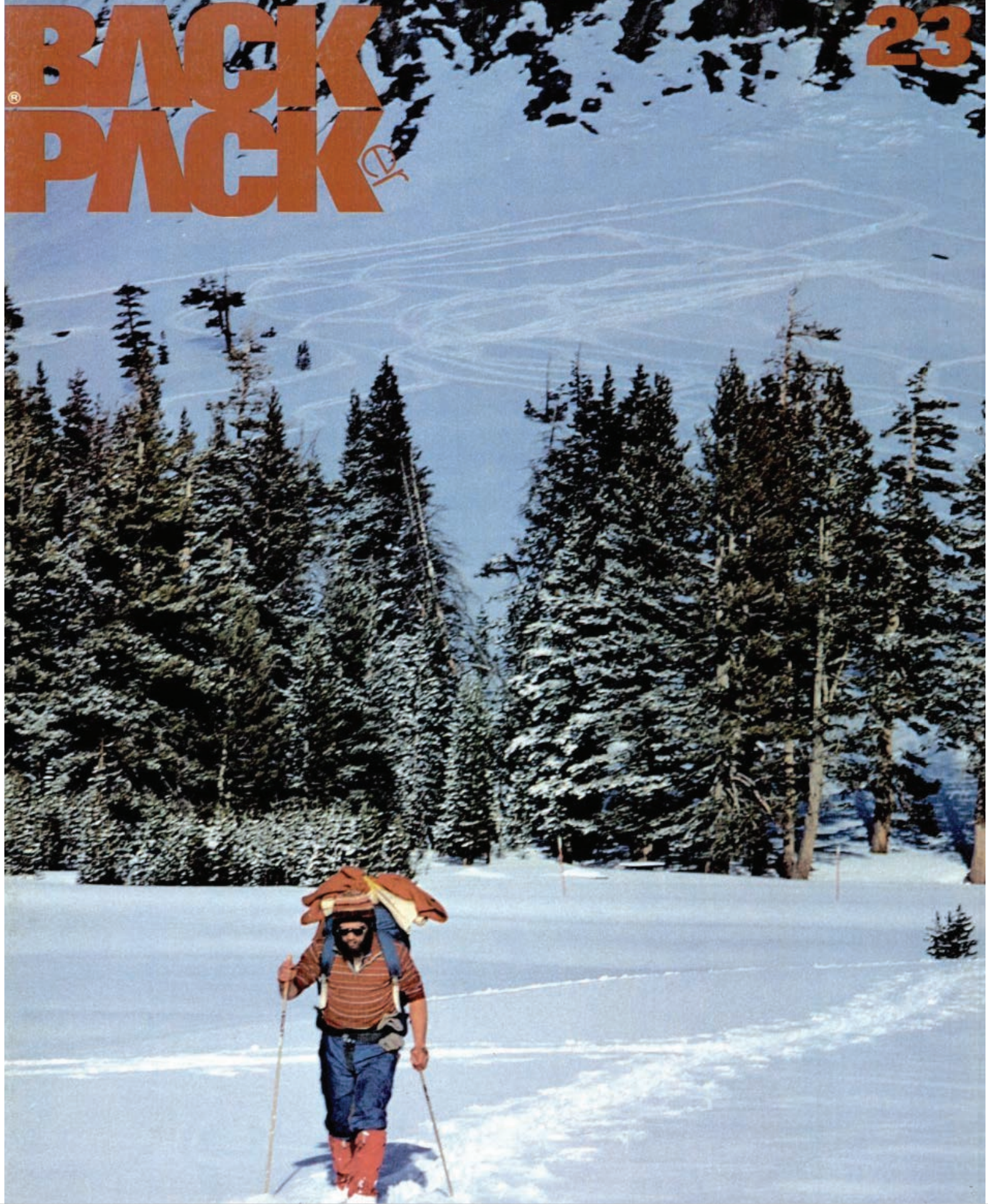


BACK PACK

23



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Cover: With the tracks of an afternoon's skiing behind him on the slope of Lembert Dome, Doug Robinson continues through Tuolumne Meadows on a three-day crossing of Yosemite National Park. Skiing in Tuolumne Meadows is one of the issues confronted by the three men who are shaping Yosemite's future in our story "These Men Are Carving Yosemite's Future." Photo by Galen Rowell.

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- 30. The Wind River Mountaineer/Photographer: Finis Mitchell.** At age 75, *Finis Mitchell* has spent more than 70 years in Wyoming's Wind River country, amassed more than 100,000 photographs of its mountains and rivers, and predicts he will be climbing for another 15 years. And he is still looking for hiking partners who can keep up with him.
- 37. Yosemite Trio: These Men Are Carving Yosemite's Future.** *Dave Sumner* profiles three men who, in the past three years, have profoundly influenced the future of Yosemite, which may signal the future of all of America's national parks.
- 44. Hiking Animal Trails.** For the experienced backpacker, there are millions of miles of trails through forests and mountains of the United States that are used only by the animals that made them. *Sam Curtis* details how to find these trails, where they go and what made them.
- 46. Across Glaciers on Skis.** A ten-day ski tour on the Lowell and Kaskawulsh glaciers in Canada's Kluane National Park. *Wayne P. Merry* tells of crevasses and moraines, mountains and grizzly bears in the shadows of Mount Kennedy in the St. Elias Range.
- 53. Cross-Country Skiing Is Better than Jogging.** Everyone agrees that cross-country skiing is fun, but did you know it is better for your respiratory and circulatory systems than swimming, running or skating? Norwegian physician *Kaare Rodahl* discusses his research which proves the superiority of cross-country skiing, and proposes that Norwegians are in better shape than American counterparts because of the sport.
- 55. Snowshoes Are the Best.** It seems as if everybody these days is rushing out to buy cross-country skis. *Henry Loble*, who has traveled Montana mountains for more than 30 winters, presents the case for snowshoes.
- 58. The Pick of the Extended Trek Packs.** The backpacking boom has spawned a bewildering array of packs. *BACKPACKER* explains some of the technological advances in pack design, tells you what to look for in the store, and rates 85 packs that are large enough to carry your gear on a week-long trek.

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The Pick of the Extended Trek Packs

How To Pick A Pack

EDITOR'S NOTE:

The equipment evaluation staff of BACKPACKER Magazine has just completed a thorough examination of 128 packs. Generally, these packs were considerably better designed and had a higher quality of workmanship and materials than the packs we have rated in years past. Because there are so many more packs on the market today than when we first rated them, we have had to devote 40 pages in our new edition of BACKPACKING EQUIPMENT BUYERS' GUIDE to cover them all. If we were to run the entire packs section in this issue of BACKPACKER, there would be no room for anything else. Therefore, we have selected those packs which are best suited for longer treks and, hence, are better for use in winter backpacking. The book will be published later this fall by Macmillan and will cost \$8.95.

Backpacking is not new. The boom in backpacking is. The sport gets more popular daily, and as one newcomer after another takes to the mountains, the first piece of equipment he or she acquires is, naturally, a backpack. Popularity has bred complexity; the prospective buyer can get snowed by the multiplicity of equipment available. Even an advanced backpacker can get overwhelmed by the jargon of backpacks, if not by the packs themselves. On the following pages we discuss the relative merits of eighty-five internal and external frame packs suitable for extended treks.

The modern external aluminum frame backpack has been around for about 30 years. (Both Kelty and Camp Trails are reputed to have invented it.) The internal aluminum frame pack is a more recent introduction. The principal advantages of both frames are their strength and light weight. Your load is carried high, close to your back and near your center of gravity, so you don't have to lean far forward as you walk. Weight is distributed all along your back, shoulders and, with the aid of a hip belt, your hips.

There are almost endless variations to the modern backpack. Packs, like hikers, have personalities. Selecting the right one requires choice. Do you want compression straps? Do you want a top-loading pack or a front-loading one? Do you want a metal frame or a plastic one? Do you want an internal frame or an external one? And so on. Below, we tell you how to pick a pack in general, then what to look for in design and construction in particular. But first, to get the right perspective, a word on what backpacks are — something less obvious than it may seem.

What is a backpack? People have carried loads on their backs for millennia—transporting goods for trade, construc-

ferred on backs were bundled with cords or straps. Different cultures improved on this method in different ways. In the West, Swiss Alpiners herding sheep centuries ago fashioned leather sacks with shoulder straps. The shepherds carried a bedroll and a few days' rations in their sacks. Military use of backpacks goes back further. Roman foot soldiers carried sacks filled with supplies and weapons.

Shoulder sacks belong to the Old World. Frame packs belong to the New. Frame packs came into their own as explorers first mapped the North American wilderness. Pioneers, miners and trappers following on the heels of explorers carried food, tools and goods to trade with the Indians across distant stretches of wilderness. The trappers and miners copied the Indians. They strapped Indian packboards to their backs. A packboard gave rigidity and control to a load. It also allowed goods to be packed vertically, which meant that more could be carried more easily.

These pioneers improved on the Indian packboard as the years went by. In 1886 an inventor named Merriam demonstrated that the weight of a pack could be carried on the hips instead of the shoulders. He was granted a patent, but his load-bearing hip belt did not catch on for another 75 years. The Yukon-style frame, so named because of its popularity with Alaskan gold rushers, did catch on. The most widely used version of the Yukon frame was the Trapper Nelson, the standard pack for generations of American hikers up to and including this century. It wasn't until World War II that the Trapper Nelson frame was really supplanted — first by the stamped sheet-metal British Army Man Pack, and then by welded aluminum tubing — what we have today.

The technological boom in backpacks, like the boom in the sport's popularity, is still incomplete. In the past ten years more than 30 new backpack manufacturers have sprung into existence. Some of the manufacturers use conventional construction techniques. Others experiment. Innovators in pack design, construction and materials outstrip each other weekly, it seems. Recent developments include plastic frames, tooled alloy castings for frame joints and hip belt and shoulder-strap suspension refinements. It makes sense to keep basics in mind to prevent yourself from getting mesmerized by accessories.

The function of a backpack is to carry the gear you need on the trail with minimum bother and since your pack is your home away from home, your choice here counts. Make it carefully.

To make a wise choice in a pack, it

Below, we discuss a backpack's components — frame, frame joints, packbag, packbag accessories, suspension system, hip belt, safety features and so on. Take the fine points slowly. After absorbing this information, you need never be intimidated again by anyone talking about backpacks, however technically.

Frames.

Your most basic decision: Do you want an external frame pack or an internal frame pack? External frame packs, basically, are for trail hikes.

Internal frame packs are primarily suited for cross-country ski tours and rock climbing.

The frame transfers the weight of the load in the packbag to your body via the hip belt, shoulder straps and backband. Ideally, the frame holds your loaded packbag firmly in place and gives it shape. It suspends the weight of the packbag for maximum comfort.

There are three types of frames — external, internal and a combination of the two. Theoretically, all three types of frame will give you a comfortable fit with a 40 - pound load.

External Frames.

These have a basic rectangular shape. The packbag attaches to one side. Backband shoulder straps and hip belt attach to the other. The frame itself can extend above or below the packbag. Above the packbag you can lash your tent or foam pad to the aluminum tubing. Beware of frames that extend high above your head; the frame tubing often gets caught in low branches. Remember, too, that some packbags have a special lower compartment for your sleeping bag, rather than frame space below the packbag.

Frames can be made of molded plastic or wood, as well as aluminum tubing. But aluminum tubing is by far most common. The strength of a tube depends on its diameter, its wall thickness and the content of the aluminum alloy. Alloy content is designated by number — 6061 and 6063 are common ones. The alloys also have temper ratings — T6 is the commonest temper rating.

While most manufacturers weld aluminum tubes together, a few bolt them together and a few use machined or cast-metal couplings. All three methods held up to our tests. The weakest frame joints were those on which the welds were sloppy. These can be visually inspected in the store.

Beware of sharp tubing bends. Bending is different from flexing. Bending fatigues metal. Fatigued metal eventually snaps. Here is a simple test to see if the frame you're choosing will withstand the

The toughest stress a frame has to meet is the diagonal pressure put on it when you set your pack down on one leg. So, to test, put one leg of the frame on the store floor, then lean on it. Increase the pressure until you get some idea of how much it will take. Generally, any frame made by a reputable manufacturer will be more than strong enough for most backpacking. Use good judgment here. No pack will withstand too much of this type pressure. So, you may end up paying for a pack you can't use.

Plastic used in frames is blended similarly to aluminum alloys. Plastic polymers, like aluminum alloys, can be varied for different resulting properties.

Wood, on the other hand, is not malleable. The proper ratio of flex and rigidity in a frame is obtained by gluing plies of wood together. Wood plies are more durable than solid wood stock. They flex and don't snap as easily.

Frame Shape.

External frames come in several shapes — the straight ladder, the S-ladder (contour), the hipwrap and the figure eight.

- *Straight ladder* frames are basic and sturdy. By straight ladder we mean that the side members are straight vertically. They're found on all lower priced packs. The straight ladder frame looks like its name — two vertical sides held together by three horizontal pieces. The disadvantages of ladder frames is that they're not well adapted to the curve of your spine. They increase the weight pulling backward on a hiker's shoulders, which is pulling the load away from the center of gravity.

- *The S-ladder frame* is a big step up from the straight ladder frame. Its vertical sides are bent to roughly follow the curve of your spine. This allows a closer fit between pack and body.

- *Hipwrap frames* are the most controversial external frames. Wrap-around proponents claim that hip-hugging frames float on your back and mark the greatest advance in backpacking comfort since the Trapper Nelson. Those on the other side of the issue argue that hipwrap frames are at best overly gimmicky and at worst outright dangerous in some common trail situations.

The distinctive feature of hipwrap frames is that the lower frame sides extend from 4 to 7 inches forward around each side of your hips. A wide hip belt attaches to the frame at these points and buckles around your hips. The forward frame-to-belt construction is supposed to distribute the weight of your load more evenly than when hip belts are attached at the rear of other style frames. Proponents of these frames claim that they can make carrying a load substantially easier, particularly for people who are not in the best physical condition for backpacking.

There are, however, several disadvantages to hipwrap frames. First, they don't fit everyone. If, for example, you have narrow hips, a hipwrap may not stay up around your hips. Or, while you are

frame does not fit properly or if your hips have a pronounced movement, you will likely wind up with sore hips. The rigid-type hipwrap also limits your side-to-side torso movements, which is important for keeping your balance. Backpacking on precarious ground could be dangerous.

Manufacturers continue to improve hipwrap frames. Two companies now have packs with hip suspensions that follow your hip and torso movements instead of hindering it. These undoubtedly are forerunners of other developments that seem sure to come.

- *Figure-eight* frames are the most specialized frame designs. Of the three we evaluated, one was for general backpacking and two for expeditions. The two for expedition treks had joints designed to even out the pack's movement as it jounces on your hips.

One of these expedition pack frames is a hybrid S and figure-eight design. A plastic swivel joint is attached to the neck of the eight in the lower part of the frame. It connects the S part of the frame to a broad aluminum band to which the hip belt attaches. The object is to enable the hip belt to move in any direction — backward, forward and sideways — independent of the upper frame.

The other expedition frame was the most specialized one we saw. It was a hybrid hipwrap and figure-eight frame. It operated something like the gyroscope on a ship's compass. The frame is jointed at the neck of the figure eight to give it side-to-side movement. The arms of the hipwrap extend around your hips and swing back and forth and up and down at the same time. The idea, of course, is to give the pack supercomfort on long hauls.

Internal Frames.

Recent improvements in internal frame construction bridge the gulf between the traditional low-slung rucksacks used for climbing, skiing and scrambling and the external pack frame for backpacking.

On internal frame packs, the hip belt and the lower ends of the shoulder straps usually attach to the lower corners or the lower center of the packbag; the upper ends of the shoulder straps to the top center of the bag itself. By being close to the back, internal frames give good control over your load, permitting you more freedom of movement.

The weakest points of internal frames are the points where the stays hook on to the packbag. These points tend to wear out, especially those on the bottom, because they get the burden of wear when you set your pack down on the ground. Inspect these points carefully. Some manufacturers sew double-fabric, or even leather, reinforcement at these trouble spots.

Internal/External Frames.

A few packs are hybrids of internal/external frame design. They are internal frames at the top of the bags, which extend out through the bottom of the bag 8 or 10 inches. Hip belts attach to the extended frame. The shoulder straps

Convertible frames.

Some of the internal frame packs are designed so that they can also be attached to external pack frames. Used by themselves, these packs are good for short trips. Attached to external frames, they are good for long trips.

Packbags.

Along with the many fabrics to choose from, one must also consider the different ways of loading the bag, pockets, stitching, waterproofing, storm flaps, lash points and zippers. Generally speaking, the more expensive a packbag, the more durable the fabric and construction of the seams. But, not necessarily so.

Bags are top-loading or front loading. Some also have a second or third zippered compartment below. Top-loading bags are traditional. They pack easily when the pack is standing. Front-loaders pack nicely like suitcases when they are lying flat. If you decide on a front-loader, make sure it has straps running across the drop flap or "D" rings to attach accessory straps to cinch the load and take the strain off the zippers. A lower compartment on a pack allows you to separate your gear so that small items are easy to get to. It also helps you distribute the load in a pack more evenly, with light items on the bottom and heavy items on the top so the pack rides more comfortably.

Pockets.

Pockets are handy. They save you the frustration of digging down into the main compartment for things. There are poorly designed pockets that bulk out awkwardly to catch on twigs, and pockets so small that a cup or roll of toilet paper won't fit into them. There are packs with inside pockets, and other packs with pockets that detach. Examine the pack pockets from a convenience point of view.

Stitching.

Check the stitching, both outside and inside the pack. Some manufacturers say the thread should be cotton wrap Dacron. Others say that the thread should be all synthetic. The argument for the cotton wrap is that it will swell up when wet and help keep rain out. The argument against cotton is that it ultimately rots. Are the stitches small? Ideally there should be from 8 to 10 per inch. Are stitching rows straight? Is the stitching far enough in from the edges of the fabric? Check particularly at the pack bottom and pocket seams. We have seen packs with stitching running off the edge of the pockets or pack bottom that came apart on their first day's use on the trail.

Reinforcing.

Look at how the bag attaches to the frame. Inspect the zipper ends. Inspect the corners of all flaps. Better packs will have reinforcing material and extra stitching at stress points.

Waterproofing.

Most packbags on the market are waterproofed with coated fabric. "Waterproofing" means the pack will probably keep your equipment dry in a light drizzle but not in a sustained downpour. A surer way

cover, which fits over the outside of your pack, or both.

Storm flaps.

It's important to get a pack with a large top flap, one large enough to cover your pack even when it's stuffed to the limits. Zippers are best covered with weather flaps.

Lash points.

Much has been made recently of side pockets with built-in sleeves to carry skis, tripods, tent poles or fishing gear. If you carry these cumbersome items, this accessory is dandy.

Depending on the kind of hiking you're into, other lash points may be useful. Ice axe, crampons, snowshoes and other special equipment travel best when lashed against the *outside* of your pack.

Zippers.

A broken zipper can ruin a trip. Most packs in our evaluation had decent zippers. It is argued among some that metal zippers ice up in winter. But many of our evaluators spend considerable time winter trekking with packs with metal zippers without problems. Check how the zipper has been stitched into the bag. Stitches should be straight and evenly spaced.

Suspension systems.

How your pack hangs on you depends on its shoulder straps, backbands and hip belt. These are the most temperamental parts of any pack. They're also the parts of a pack guaranteed to give you the most grief if they're not functioning as they should.

Shoulder straps.

Shoulder straps should be padded with firm material and be wide enough to carry your load comfortably. They should be adjustable for length. Watch out, on cheaper packs, for shoulder straps constructed of a slippery nylon belting — these tend to slip through the buckle fastening at just the wrong times when you're carrying a heavy load.

Backbands.

Backbands are used to distribute the weight of the pack evenly over your back

and to keep the frame — external or internal — away from your body for ventilation. There are three types: the mesh backband, the plain nylon fabric band and the padded band. Try on loaded packs with each type of backband to see how they feel on you.

Hip belts.

Hip belts are more comfortable when padded. Some are made with one continuous strap, others are made with two, each attaching to one side of the frame. Some backpackers find that two-piece belts hold the pack frame clamped too tightly against their backs. The single piece belt, on the other hand, permits the frame to "float" on your hips. Other backpackers find the one-piece belt gives them a feeling that their load moves around too much on their backs. But then, some of the best packs on the market come with two-piece belts. So don't let the belt be your main criterion of selection. If you decide upon a pack that fits all your needs but has a two-piece belt and you'd rather have a one-piece belt, you can always buy a one-piece belt separately and attach it to the frame.

Quick-Release Buckles.

A safe pack is basically a pack you can jettison if you take a fall. Quick-release buckles enable you to get out of your pack rapidly in those circumstances.

Special Features.

You should be aware of the great variety of extras available — zip-out dividers, camera rings, frame extensions and so on. The rule of thumb is: Extras are nice, but don't let them become the basis of your selection.

Final Considerations.

Whatever pack you buy you ought to expect a certain minimal performance from it.

• *It ought to last.* The two things that make a pack last are good materials and good workmanship.

Check the pack fabric, shoulder and hip belt padding, zippers and frame metal for quality. Compare one pack with another.

Look at the workmanship in seams and welds. Make sure that the packbag is well stitched and reinforced at stress points, such as the seam between the pocket and bag and the reinforcing at the ends of the zippers.

• *It ought to be comfortable.* You want a pack that fits. Which means one that allows motion of your body as you hike and good weight distribution on the hips and shoulders.

Fitting a pack takes time. A pack is almost as personal as a pair of boots. Some packs are made in sizes and their manufacturers publish tables telling you to measure your spine from one skeletal point to another. What it boils down to is this: Only a small part of the pack's weight should rest on your shoulders; when the hip belt is snug where you want it, the shoulder straps should be high enough so that you can drop a shoulder without the pack swinging off. But the shoulder straps should not be too high. They should rest comfortably on your shoulders with the hip belt fastened.

But to be sure, you should try on the pack in the store with the bag loaded to capacity. Too many first-time hikers try on empty packs with too little weight or with it poorly positioned. They buy the pack, load it up and three miles out on the trail find out that it's a medieval torture rack. Most backpacking stores have sandbags to help customers get an accurate idea about how the packs feel when they're loaded.

Read the information in this section on design and construction of backpacks; use it for buying your pack. Then put it out of your mind. Too many beginning hikers become slaves to trade names and jargon. Trust your instincts.

Shop the way your grandmother did — look around, compare brands and prices, and try on everything. If you're beginning, try to arrange to rent the pack you're considering buying. The moment of truth for a backpack does not come in the store, but usually sometime during the third hour of uphill slogging.

How The Packs Were Rated

Probably the single most important requirement in a pack that will be used for longer treks is a sufficient gear-carrying capacity. We set arbitrary guidelines of 2,500 cubic inches main bag volume for frame packs and 3,000 cubic inches for internal frame packs as the minimum capacities necessary for a week's trek. We sorted out packs on the market that fit these guidelines, and were surprised to find that 85 of them met these requirements.

At least four members of our equipment evaluation staff examined each pack and rated it on a scale of 1 to 5 for each of 20 different criteria. We weighted the criteria and arrived at an overall opinion of each pack's comparative quality. We also asked each evaluator to give a separate opinion as to the pack's suitability for extended treks. There were some considerable differences among our evaluators, mostly reflecting their own particular preferences. On balance, though, these differences evened out in the overall score. Where there was substantial disagreement, we took the packs out on the trail for a more critical evaluation.

Since there were so many packs in this evaluation, there was only enough room for photos and full descriptions of fifteen of

usefulness on extended treks. The ratings for all 85, however, are listed on the specifications charts. We rated them in three ways: on their overall quality; their suitability for extended treks; and on their value for the money.

In using this information, we suggest you consider a couple of important points: 1) Are your trips mostly long ones or do you make a lot of three and four day trips? 2) Will this be your only pack or will you also own a pack for shorter trips? We strongly advise that you use our evaluations mainly as guidelines that point out considerations which you may not have thought about before. In the final analysis, decide for yourself what you want your pack to do for you. Is it to be used exclusively for long treks? Do you want it to be useful for hiking and climbing on snowfields and glaciers as well? Will it also have to serve you for your three day weekend trips? It's best to buy the pack that will meet most of your present needs rather than only a few of them.

The complete descriptions of all the packs rated here are included in a 40-page section of our new book, *BACKPACKING EQUIPMENT BUYERS' GUIDE*, which will be published by Macmillan late this fall. There are a total of 128 packs listed in the book along with photos and evaluations of their suitability for general back-

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