

THE RIVENDELL READER • ISSUE 2 VOLUME 1

THE RIVENDELL READER, TAKE TWO

RR 0 and 1 were mailed to more than 4,300 people, and close to 1,280 of you have sent in your \$20 membership fee. Thanks. I realize it's June and this is only issue #2 of six promised, but the issues are larger than promised, too. Anyway, as a mail order business I've got to get out more issues more frequently, so expect more frequent mailings.

If you've joined and ordered, that is. Otherwise, this may be the last RR you see. Sometime in July I'm going to ask the computer to eat everyone who hasn't joined, not as a mean thing, but as a practical, cost-saving thing. This is my last chance to ask.

Originally the deal was that if you joined, you received quarterly rebates on your purchases, in the form of a 5 percent Gift

Certificate. Well, it's hard to send a gift certificate for \$1.50, so from now on we'll rebate you by the order. We've been doing this for a month or two now, and ya'll seem to like it. (And if you want your less-than \$2 gift certificate rebate, you still will get it; be patient. Maggi sends off about fifty of them every week.)

Things are going okay. On a good day we'll receive maybe nine orders and four new memberships totalling \$800. On a bad day, it's down around \$139. The frames are shaping up, some new projects seem to be working out. It's not a fantasy life as the name implies; it's hard, and nervous-making. I get the feeling that a lot of people are rooting for Rivendell, and that keeps me going on those \$139 days. —Grant

THE PROGRESS REPORT

Feb. 10. Two orders today, the worst yet. Paid all the bills last week and the account is down to \$36,000 with about \$18,000 still owed, and another \$6,500 or so due for the first RR mailing. Not a big deal yet—just the facts.

Feb. 11. Dropout problems. Well, not problems, but the final quote was based on a Taiwan dropout, and I thought it was based on the Shimano. The Taiwan one is ugly and doesn't have the right numbers—the hanger drop is 29mm, and the largest I can live with is 28, and I'd really prefer 26 or 24. The Shimano drops Waterford has have

zero eyelets, and I want two per dropout, and that's eight per bike, and that's a lot of money. Shimano makes a longer horizontal, which I prefer anyway, and that comes with one eyelet, but they're not available. It still costs twelve times what the Tai drops cost... I'll look into having one made to spec, but that'll come later. In the meantime it looks like the Shimano single-eyelet, with another brazed on. I can use Taiwan for the front, since they're fine. I don't want people to think I'm chintzing out on the dropouts if I go to Taiwan. The ones I'd use are made by the same people

who make Ritchey drops, and they are as well made as any. I'll look into having them forged over here, but does it make sense to pay quadruple the money to a forge that has never made a dropout before, and who will regard my business as a nuisance at best?

Feb. 12. I've got to charge more postage to foreign countries.

Feb. 16. The phones aren't working and Pac Bell is a pain to deal with. The repairman that came by yesterday left his card, "just in case something doesn't work again," and it didn't, including the telephone number on

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LETTERS



THE RIVENDELL READER

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Sometimes I accept freelance work, but the pay is minimal and I generally edit it like a madman. Thick-skinned writers may submit manuscripts on Mac disk (Word 5 pref) or double-spaced and typed. If you have to hand-write, that's okay, too.

Dear Grant,

Many thanks for the RR/1. At last it's out!

Could you please send me a couple more copies (in an envelope) to send to colleagues? The photos won't xerox well as they are. My colleague in Sweden has been waiting to see this so he can refer to it in his PhD dissertation.

It came out fine except for the mislabeling on all but one of the photos. Your "rough out" was actually the Blank, your "primary preform" the Rough Out, your "secondary preform" the Primary Preform, your "tertiary preform" the Secondary Preform, your "ground preform" the Tertiary Preform, your "bodyflaked preform" the Ground Preform; the last one you got right. I don't know how that hap-

pened because my copy of the xeroxes of the photos and their labels are correct. Because of those mistakes, I can't refer to it as representing my research. That's a pity, as I sorely needed to. I only wish you'd sent me some proofs to check over before going to press. Oh well, what bicyclists will give a damn anyway?

Thanks for giving my name and correct address. Maybe something will come of it yet.

Thanks.
 Errett Callahan.

To those of you new to the RR, this refers to The Danish Dagger story in RR-1. Properly mortified am I, so it reruns, corrected, in this issue. —GP

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LIABILITY: A TALE OF MADNESS

by Howard Runyon

Time was—and I remember when, and I'm not forty yet—one didn't much hear the noun liability. One heard the adjective liable, from the same root (Webster's Ninth New Collegiate gives it as *lier*, to bind, from Old French), but normally it was used like this: "If we don't leave before *six*, we're liable to be late."

That was then. Now the noun is with us like white on rice, and the talk isn't about being late for dinner anymore.

Last winter I learned just how far things have changed. I'd taken my friend Henry to the Adirondack Mountains, my old home, for some ice climbing. Henry, an off-road cycling fiend most of the year, becomes an ice-climbing fiend in the winter. I'm an old climber transplanted to Chicago, where Henry and I met. Since moving to the flatlands I've done nothing outside except ride bikes, because being a climber here means making long drives for short climbs, and I prefer to find my fun close to home. But when I visit my folks in northern New York State for the winter holidays, I like to get out the ice tools and revisit the long, pretty routes that I frequented when I lived there. Henry hadn't seen Adirondack ice and was hankering for it, so when it came about that we both were going to be in New York City on a certain winter weekend he talked me into taking a couple of extra days for a side trip up north.

Our first major project was one of the local "musts," a long gully that splits a wall of cliffs rising from the edge of a big pond. We spent the morning indoors, waiting for the temperature to crack zero, then ate lunch and drove up to the pond. We were about to start across it when Henry noticed a broken buckle on one of his crampon straps. This meant a trip back to the mountaineering shop in town. It was about one o'clock. We'd planned to do another climb, a lovely frozen waterfall, on our way home from the gully; now the best we could hope for was to get Henry's strap fixed or replaced in time to allow one climb before dark.

My crampons, old-fashioned things with lots of straps and buckles, were already on my boots. I didn't want to take them off and then have to put them on again, so I waited in the car, soaking up sunshine, while Henry went into the shop for help. After about fifteen minutes he came out with a mitterful of parts and some strange news: The shop manager had come up with what he needed but had refused—politely—to do the installation, for reasons of liability. This seemed odd, but we had things to do, so I let it pass. Henry set to work on his crampon. He's a very strong and spirited climber and bike racer, a talented businessman, and an unstoppable learner of languages, but he doesn't have the steady inner vision that lets some people see quickly through mechanical problems. I watched him make a couple of false starts, then butted in and talked him through the repair.

We went back to the pond and got up and down without mishap—though the going was unusually difficult, both in the **gully** (thin ice under deep snow) and on the long, roundabout bushwhack back down to the pond (snow chest-deep in places). There was no time left for the waterfall, but we were too tired to mind. We'd been in a hurry from the first step, because though somewhat prepared for trouble—we were carrying headlamps, a little extra clothing, and a thermos of hot water—we had no wish to be out after dark when the daytime high had been only 15°F or so. Plus I'd told my parents that we'd be back by such-and-such a time, and when someone's overdue in that part of the world people tend to take it seriously—doubly so in winter.

As we drove back to the homestead, no longer in a hurry, I thought about what had happened at the shop. The more I thought the more amazed I got. The manager's name is... Tom. (That's the only thing I'll say about him that isn't true.) He's a nice man who likes his customers and knows about what he sells. He comes from a family of upright people. But he refused to repair a life-and-death piece of equipment even though he knew how. Because Henry might take a crampon correctly fixed by

Tom and have an accident—for any of a hundred reasons—and his accident bring down a lawsuit on Tom, Tom thought it better to let Henry run the risk of climbing with a crampon incorrectly fixed by Henry. Which, of course, would have made an accident all the more likely. Which led me to wonder: What is this world we're living in?

I hold nothing against Tom; he's an honest guy doing his best. What pains me is the social and legal climate in which he and all the other poor sporting retailers—and equipment makers—now do their jobs. It makes my head spin: A sane, well-meaning retailer fears the possible consequences of a client's going out well prepared, by the retailer, more greatly than those of the same person's going out, as a nonclient, poorly prepared by himself.

This fear of lawsuits may seem far-fetched. It isn't. A few years ago the entire American climbing-gear industry was in jeopardy because of a lawsuit brought against a harness maker by the family of a man who'd died after falling out of an improperly buckled harness. The plaintiffs admitted all along that the man had failed to follow the maker's instructions in buckling the thing. What they objected to, in effect, was that the maker had sold something that was capable of being used incorrectly. Eventually the court found in favor of the harness maker, but the struggle was long and serious.

This turn of history isn't just bad, it's downright bewildering. Is there any way that we—the retailers' and equipment makers' clients—can fight it? I see just one. We can't ask them to stop fearing the lawsuit, because it can put them out of business—if not by wiping out their assets directly, then by putting the price of insurance somewhere over the moon. All we can do is **try** to see that fewer lawsuits happen. If there were fewer suits, insurance would cost **less**, and knowledgeable people like Tom would be freer to share their knowledge without fear of retribution. I know this is un-American—the television jumps with sad-eyed lawyers begging us to call their toll-

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free numbers if we've suffered any injury, so they can help us get what we're entitled to—but I think it's the only way to make sure that fun stays legal. We must believe almost absolutely that when we stick out our necks it's up to us to see that they don't get broken. We must believe that if we tumble down an icy gully and sink in a pond, or flip a bike over a log and sever our spinal cords, what we're entitled to is sympathy if we survive and a decent burial if we don't, and no more. (I say almost because, alas, I think we should be able to sue the carmaker who sells a car after learning that it will explode if rear-ended by a shopping cart, and the frozen-food packer who puts Portland cement in macaroni and cheese to make it stand up better to a fork—anybody who seems to have been deliberately murderous or negligent. Even if we drive the devil from the house, we must let him keep a key.. .)

So please, if you want the world to stay safe for do-it-yourself recreation (as opposed to the Disney World kind), go out and do as you like, but be well informed and be careful; and if you have an accident anyway and maim yourself or lose your best friend, then grieve, and reconsider your choice of hobby, but for God's sake don't sue anybody. I want a world where the Toms can fur things for us and not have to lie awake at night fearing ruinous vengeance, where we don't look for someone to blame when we hurt ourselves in the pursuit of fun. I want that noun, that L-word, to be scarce again.



The following rules to ride by was borrowed verbatim from the back cover of a 1938 Carradice catalogue.

CYCLISTS TAKE CARE

A code of cycling conduct approved and issued by The Cyclists Touring Club, 3, Craven Hill, London, W.2.

THE LAW requires that you:

Carry on your machine, when cycling during the hours of darkness, a white front light and unobscured and efficient rear reflector plus a white surface of not less than 12 square inches. (if you elect of your own free will to carry a lighted rear-lamp, instead of a reflector, you may dispense with the white surface.

Carry a white front light also on the sidecar, if one is attached to your cycle when riding at night.

Do not hold on to other vehicles unless you have lawful authority or reasonable cause.

Give way to pedestrians at all pedestrian crossings not controlled by police or light signals.

Obey traffic signals whether you are riding or wheeling your machine. Go slowly or come to a stop before entering a major road from a minor road if there is a traffic sign requiring you to do so.

Keep as near to the left as practicable unless about to overtake or turn to the right.

Avoid riding too many abreast and thus impeding other traffic.

THE HIGHWAY CODE exhorts you to:

Be able always to pull up within the distances for which you can see the road is clear.

Overtake only on the right, except when a driver in front has signaled his intention to turn to the right. (Subject to any local provisions to the contrary, tramears may be overtaken on either side).

Avoid overtaking at a pedestrian crossing, at cross-roads, or at a blind comer.

Give the appropriate signal clearly and in good time before you stop or slow down or change direction, and when approaching a constable or other person controlling traffic.

COMMON SENSE impels you to:

See that your brakes and tyres are dependable.

Avoid cutting comers on the wrong side.

Dismount when it is risky to proceed.

Beware of skidding on greasy or muddy roads, through applying your brakes suddenly, or through carelessly negotiating manholes, drain covers and tram lines.

Avoid depending on "the other fellow."

Keep an eye on the movements of other traffic.

ORDINARY COURTESY implies that you will:

Always behave towards other road users as you would like them to behave towards you.

Always be a true sportsman.

Help to promote goodwill on the roads.

his card, which had been disconnected or was no longer in service. I finally got through to someone, and she spent most of her energy explaining that she handed it off to someone who lateralized it to someone else, but please be patient, we're backlogged due to the rain. It hasn't rained for a week, and the last two repairmen who have been here left things worse than when they started. I'm trying to figure out the PlastiCard processing, and finally got another phone line installed. The Reader is in the mail now, and I hope I get some orders this week. I need to reorder Bullseye pulleys. I filled out a credit app. for Mavic. BOB T. D. gave me a lead on cloisonne badges, but the lead time is 90 days, and if I don't have frames by then I'm in real big trouble. I've been experimenting with different waxes for chains, and I think I've got it down. The first ones went out really caked, but the next batch will look neater. I got a quote yesterday for the bar-end shifters: \$32,000 for tooling. Up quite a bit from the first estimate of \$7,000. What do I do without bar-end shifters? Moustache H'bars depend on them, and they're perfect for the A/R (or whatever I call it).

Feb 17. I got a quote on forging dies for dropouts—\$9,600 (in Berkeley). Too much. I'll have to find good horizontals elsewhere. Waterford has lots of short eyeletless Shimanos. They can braze on eyelets, but that costs a lot. It may be worth it, and they are selling the Shimanos to me cheap, since they no longer use them. The Shimanos are wonderful dropouts—maybe my favorite Shimano part! I found out RR-1 is being mailed today, not two days ago. Two weeks later than I'd hoped, but that's not so bad considering all that was going on. I'm getting a headstart on this one. I think I'll do a blurb on dropouts, since I have them on the brain these days. All I think about is dropouts. I fondle them while talking on the phone, I twirl them about, I hold them up to the light to see them in silhouette. You'd think they were lugs, or something.

Feb 21. A friend of Jeff's took the logo off some stationery and in a day etched what he thought the headbadge should be. I like it a lot, and there's still time. He says he can cast it in pewter then plate it in brass,

but I want it colored. He also said he could stamp it, and that would be the best yet, but I don't know if he can paint it. I'll have to see. Yesterday I asked Eric if he could come up with a fitting for underneath the road crown, for mounting mudguards, since it didn't occur to me to have something cast in there. He developed something perfect, and he'll quote on them in a week or two. They'll be machined, darn. Eric saw the AR lugs and likes them. What a thrill—he's influenced my taste in bikes more than anybody else, and he likes the lugs.

Feb 22. Well I know for sure that at least some people have RR-1, and I hope something good happens. I got a letter today from a good friend who tells me he hopes Rivendell makes it but thinks it won't. "I'm concerned that your love for the elegance and the purity of the bicycle may blind you to the realities of the business climate....I hope like hell there are 2000 names on the BOB list that'll buy whatever you've got, but I'm really concerned that there aren't." This on a day following two weeks of very few orders..bummer. About 700 BOBs have signed up, and I thought I'd have about 1500 by now, and maybe that's the "reality of the business climate." I did get some fax and phone orders today, but for the first time since before January I'm worried. How do I express this without sounding like I want pity? I just need more members and I gotta sell stuff. It's supposed to be fun. I feel guilty if I ride my bike.

Feb 25. Sixteen orders today, evidence that the RR is out. I'm over the fear of processing plasticards, but I should probably account for the bank fees (2.3%) in prices. Yesterday's orders totalled \$1,409 and today's may go as high. People are starting to cash in the GC's. Spencer and I took a break and went for a ride, and he crashed and landed on his face, but he's okay. We're really low on Carradice bags, and it takes a long time to get the brass buckles.

Feb 27. I'm having a bad day. I bought some front dropouts from Big Parts Maker, and they required cash or a cashier's check—not even a company check! Ten years in the bike industry, and I have to pay with a cashier's check. Fine. I expected orders to be coming in like crazy, as they used to

after a BOB Gazette went out, but the fax was empty when I got to work today, and the phones have been really quiet. Here's comes a fax now. The bank balance is down to \$34,000, and still all that tooling to buy. I don't want to do without the stem, but that's another \$8,000 in tooling. It's no fun having my disposition so dependent on the fax and phone and mail. Later that day. The fax that just came was a Frame Interest Form (thanks, P.D.). I did get the mail today—13 orders, and that makes maybe 18 for the day. That sounds good, but it should be at a high point now, because it's going to tail off.

Feb 27. Good day! Spencer was here all day, and we got about 20 orders, totaling \$1,700. C from Specialized even sent in \$100 just to help out. Got a quote on Taiwan dropouts. Darn—those guys are so easy to do business with. I did find some nice looking drops, and I have it on good authority that they're very well made. I'm talking to Nitto about stem bolts for the stem. Still deciding on bottom brackets. The fork crown samples still aren't in.

March 5. Oh dang—problems with the Carradice bags. It seems every time I try to do something special or improve on something, it backfires. The special-for-Grant brass buckles are NOT the same dimensions as the standard ones, and sometimes you can't get the thick Carradice leather through. This was brought to my attention when one customer ordered a bag, got it, and said his arthritis made it hard for him to work the buckles. So yesterday, I experimented. I cut off the prong, thinking it would hold without it and maybe the prong was the problem. But I couldn't even get the leather underneath the second arm of the buckle. Sometimes it works fine, but there's enough variation in the thickness of the leather, that sometimes it's just a no-go. That's when I measured the buckles and discovered the difference in dimensions. So I've faxed Carradice and asked for some help. Mr. Chadwick must be furious. Here's the dumb American asking for something special, then it doesn't work, then he comes back. I'm offering to eat it all, hoping he'll own up to something, but we'll see. In the meantime I'm going to contact every buyer and offer to replace or refund.

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March 8. I called Carradice and Mr. Chadwick said to send the bags back, that they should have checked them, and he'd give credit. Then I ordered a lot of the standard models, with zinc-plated steel buckles—that-fit (I thought they were aluminum), and we should have them in 3 weeks. Other than that, it was a busy day—John and Trisha were out here from Bstone Tennessee, helping. Our sales today, which included some of yesterday's invoices, too, were \$1,530. That makes up for all those \$200 days of last week. But the big thing of the day was that I blew it on a phone call, and this is eating at me. A guy called and the conversation went something like this:

"A friend who's a printer said I should call you. Do you sell used bikes?" (at this point I think he's trying to sell me advertising).

"No, I don't."

"Well, I heard you sell vintage bicycles and bike parts.." (now I'm thinking he wants me to buy something for sure, because usually people who have tried to sell me before try to engage me in a conversation first, before identifying themselves.)

"No, I don't. "Vintage" sounds like Model T's, or something."

"Well, what DO you do?"

I was a little put out by now and said

"You called me and you haven't told me what YOU do!"

Then he said something to the effect of

"I was looking for some (classic or something) bicycle parts, but obviously I have the wrong number." Then it occurred to me, finally, that maybe he wasn't trying to sell me something, and I tried backpedaling, but I couldn't do it fast enough and he hung up. I felt like crud the rest of the day, still do, and I'd give anything to be able to undo that. I wish I knew who it was. I completely blew it. I don't even care that he won't buy anything, I was just rude, and—oh, man. I wish I could try that one again.

March 13. Wford said the new Reynolds decals came in, and from the description, they still aren't right. How? How? I'll have them by Thursday to see for myself. Was my description to blame, or what? The money just drains and drains.

March 14. The road and all-rounder fork crown samples arrived, and as Marc said,

they're not quite to spec. Beautiful, but too airy. They need more metal, so Chris is redrawing them. They don't have to be the lightest crowns, just the prettiest. Mostly, I don't want them to break, ever, and I don't care how long a delay this causes. I contacted a tester in Wisconsin. Today's invoices totalled \$1,002—but was two days' worth, not great. I want to ride more. I've been averaging fifteen hours a day for two months, and I need a rest. Tube color samples and decals come tomorrow. I ordered mock T's today, should have them on Tuesday the 21st. Got word from Brooks—and a stat of the logo they'll emboss on the saddle. It's an earlier version of the double R, with a small Rivendell Riders banner across the bottom portion, partly obliterating the Rs. It looks fine, a bit showy, but it'll be small. I wish I'd just stuck with the plain double-R as seen on the front of the Reader. I think I submitted that one, too—and specified it later. But they've gone ahead with the other and I don't want to muck up the process by changing anything now. Sheesh—that'll be a lesson: I'll never again throw anything into the soup with the idea that I can pull it out later. One interesting note from Brooks: I'd asked for an allen-key nose/tensioner, instead of the hex-nut one that comes standard. They do the allen on at least one other model, so I'd assumed they could just plug it into this one, and it's way, way easier to deal with than the hex nut. Brooks's response: "Cannot do Allen Key Adjuster on the B17 - this would involve a whole new nose and tension key assembly. Also...tends to make adjustment too easy and leads to over tensioned saddles." I like that answer!

March 15. Got the tubing decals from Reynolds. Wrong colors. It's funny—I thought in this life segment, I'll deal with English-speakers and have no problems. Maybe I'm the problem. Between Carradice and Brooks and Reynolds, I'm going mad. It must be me. I'm strongly considering no tubing decals at all. I also got the last batch of color samples, and the frame decals. The blue is perfect, the dark orange is perfect, the silver is perfect, and the golden olive is really close—Roger at Waterford is the best with colors. I had Gary P. make lots of different decals to try,

and one of them, a blue and yellow with a clear hollow, is perfect for at least two, maybe three colors. Tomorrow I'll go over more of the decals. Paid a lot of bills, including \$6,150 or so for the printing, and now the account is down to \$27,500, with so much in tooling due really soon. Today seemed slow, but the invoices totalled \$1,006—four bucks more than yesterday. Cloisonné samples came in today, and they're gorgeous. Lead time is 90 days, though, so no chance right off the bat. For a head badge—that's what I mean.

March 18. Got a sample cast pewter badge today—it looks crude but terrific, and the final won't look crude. Zog arranged it—the surfboard wax guy, believe it or not, He's an amazing fellow; actually gets things done when he says he will. The cost will be less than cloisonné, but dang, that cloisonné looks nice, and I could pick colors...I want both.

March 21. I got a sample saddle from Brooks today. I wish I'd picked a different logo, or none at all. The Rivendell Riders banner across it obliterates the RR, and without the Brooks brand on the side it looks like a cheap house brand. I'll see what I can do about it.

March 23. Two slow days in a row. Carradice bags are starting to come back, but at least eight people have said "Mine is fine, I won't return it!", which is fine, so long as they aren't trying to go easy.

Mar 25. The first frame came today, a 56 road in French Blue II, which Spencer still calls Univega Blue. I assembled it as fast as I could with a Stronglight headset and BB, left Superbe Pro arm, right Shimano 600, left Zeus pedal, right Campy, Mavic stem, 3ttt bars, Specialized post and Ucanitor saddle, to be switched to a Simplex post and Brooks saddle tomorrow—I was trying not to rob too many bikes to assemble this one. I put 35c tires on my standard wheels, and new Campy Super Record short-reach brakes, and all the clearances are perfect. I put C-record retrofriction levers on, but I didn't have the time or patience or cables to hook up the derailleurs, so I put on a 13 x 24 seven speed (I ride 6, but I wanted to check the clearances) and rode about 9 miles in a 51 x 16. I know it sounds bad to say this, and

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INTERVIEW: BULLSEYE'S DURHAM

Roger Durham is the founder and owner of Bullseye, the Burbank, CA maker of hubs, derailleur pulleys, welded cranks, bottom brackets, and crank-actuated brakes. He started the company in 1976, and in the '70s and '80s virtually every racer looking for an edge rode with red Bullseye derailleur pulleys. (The red, in the days of silver and black, was a clue that Roger was a little *different*.) I remember a poster—a Sidi poster, I think—showing Jonathan Boyer third in line in what appeared to be a breakaway group of four. The most distinctive thing in the photo was the red Bullseye pulleys. Bullseye ads claimed that, compared to The Leading Pulleys, the reduced friction in Bullseyes conserved the amount of energy required to haul a 100 pound sack up 76 floors, or something like that. I like Roger a lot. He's crotchety, opinionated, quick to rile, but friendly, and every time I talk to him or read something he wrote, I either learn something or get a *different* perspective on something that matters to me. I don't agree with him on everything, but I'd hate to debate him in public, because he's smarter.

RR: What did you do before Bullseye, what prompted you to start Bullseye, were you influenced by the success of Phil Wood, and which came first, the pulleys or the hubs?

RD: The pulleys came first, in 1972. I was influenced by Phil—the first Phil hub I saw appeared to have an angle at the left bearing, and later, a friend brought by rear hub with a failed axle, which led to a worn out bearing. I fixed it with a single alloy axle and a new bearing. They've changed now, but at that time Phil hubs had to be repaired at the factory. That didn't make sense to me, so I designed a hub that could be fixed at home using simple tools. My hubs have had an almost perfect record for 19 years, and use the same bearing in all four places. Also, since our hub shell is aluminum, it doesn't rust.

RR: Your brochure is pretty interesting and convincing. Did you write it yourself, and is it still true that *after* all these years, you've seen just two bent rear axles, and no broken ones?

RD: Now it's up to six bent, but still none broken. Yes, I wrote it myself.

RR: You've said "I'll never make a cassette

hub." But even Campy and Phil make them now. I like the No Cassette stance, but I'd hate to see you go out of business. What's your problem with cassettes?

RD: Oh, I may relent eventually, but a light freewheel and hub combination is lighter and simpler than most cassettes. The threads make a good connection between an aluminum hub and a mostly steel freewheel, and the combination is less expensive. Freewheels are easy to repair and cheap to replace.

RR: Maybe for you, but I've been doing the bike thing for 23 years or so, and I've never learned, and never had to—and never wanted to repair a freewheel. I've had one apart, but never back together. Anyway, let's talk about your hubs. The axles are threaded and they come with allen bolts. Do you have anything against quick releases? Also, why are axle bolt threads and heads not metric?

RD: End bolts hold three times as tight as quick-releases

RR: Is that necessary?

RD: Listen, they're much lighter, too. In a regular hub, the kind you probably ride, the 10mm axles are drilled hollow for the quick-release. Those skinny, hollow axles have been a source of trouble since Campy himself drilled out the first one.

RR: What about the non-metric threads and heads? I have a friend who rates your hubs a strong A-minus, just because of that.

RD: Most threads on a bike are English—the pedals, freewheels, bottom brackets, steering tube—so why not end bolts? If you don't like the non-metric allen, you can replace the bolt with a hex head, and most cyclists carry a small crescent wrench—

RR: —I don't know about that, Roger.

RD: Well not too many people use end-bolts, anyway, so there hasn't been much demand for a change.

RR: Okay. Of all the parts on a bike, which do you think is in most need of redesign, and how would you go about redesigning it?

RD: Head tubes and headsets. Running the fork up through the head tube is an archaic way of doing things, and current

head tubes are too short, which results in inordinately high radial loads on headset bearings when the wheel runs into an obstacle. I have patented a headset which uses two hub bearings. The fork stays outside the head tube.

RR: I'll bet that's attractive. Mountain bike riders might love it.

RD: It works better, and that is attractive.

RR: Fine, just keep them off road bikes, okay? New topic: How active are you in Bullseye's day-to-day operations, and what plans do you have for Bullseye?

RD: I'm active. Plans? Over the years, Bullseye products have become popular among the people who actually use them. It's fun to replace a hub flange on an 18-year old hub and return the hub to the owner for further use, and it's fun to get a letter from somebody telling me his Bullseye pulleys are now on their third frame, still going strong. I don't change designs often. Bikes really are simple machines, so Bullseye parts are simple, too. Our first hubs are just as guaranteed as our current hubs, and we're content to go along this way.

RR: Let's talk about hubs for a while. I know you aren't enamored with traditional cup-and-cone hubs (which I happen to like a lot)—why?

RD: My wife bought a Campy-equipped DeRosa, and I found that cone adjustment is affected by the tightness of the q/r. The very act of tightening the q/r shortens the axle and tightens the cones—that's another problem with drilled out 10mm axles—too flexible. There's no uncertainty with Bullseyes, and clamping down hard doesn't affect the bearing adjustment.

RR: But in a cup-and-cone hub, at least you can get rid of the play at the rim. With your hubs, and Phils, too, there's that bothersome wiggle that no amount of clamping down can get rid of.

RD: It's so little, and it's only "bothersome" if you're off the bike and wiggling the wheel side to side. There's no way you

continued on page 13

I acknowledge the psychological influences, but this is a dream bike. The 35c tires felt like 28s. Maybe it was the lack of derailleurs. Anyway, I couldn't be happier with the ride. The sample doesn't have the diamonds on the bottle bosses, but the real frame will; and I've got a Henry James crown for now.

March 28. No word yet about how long the crowns will take, dang. Unicrowners don't have this problem, and neither do stock-crowners. I hear *VeloNews* is going to review the RR, and that makes me nervous. Will they mention the typos? Will they describe it as "a somewhat interesting, half-baked effort"? Time for another Nitto order. Mostly I need stem bolts, something I don't want to trust to anybody but Nitto. Nitto stem bolts cost roughly 200 times what a Taiwan stem bolt costs, and I'm sure the Taiwan ones are fine. The thing is, I'm going to use longer bolts, and the stresses on them are greater, and I want peace of mind. I'm also ordering DirtDrop bars, and a rarer-than-usual Nitto drop bar with 3tt-like dimensions, but without the groove for aero cables. I got in samples of Weinmann 500 sidepulls—the brakes Tom Ritchey raced with when he was such a fast Junior. I rode with them for a while on my Ritchey, too—and saw them on a couple others. They're light, not well-finished, but not ugly, and they do work. Only problems are the non-allen bolts and the left-handed arms.

March 29. I owe more for tooling than I thought, and that and the delays are driving me nuts. All these expenses coming up, and the funds are falling off fast. I think I'll ask the original investors if they want one more chance at buying stock at the original prices, and maybe I can raise \$15,000 or so that way. A huge Carradice order is coming in, then the Nitto order, some MKS pedals—it just never ends. The Mock T's are in and look good. The orange on the back was supposed to be yellow.....but it still looks good, and I didn't squawk. The reflectors arrived yesterday, I sent some to Bicycling with the hope that they'll review them in the New Products section. Maybe not trick enough, but I like them.

March 30. I wrote a check for \$9,300 for tooling today, bringing the bank balance

down to \$18,000. My next Nitto order is close to \$4,000. Wow—in the teens. I remember sweating when it broke \$40K. At least the mock T's are paid for, but the next Carradice order isn't, and it's around \$5K. Carradice generally gives me 30 day terms, and it's due here Monday. *My money comes and goes, and runs and flows through the holes in the pockets of my clothes.* there:

the first Bob Dylan lyric ~~is~~ a long time. What this company needs is an influx of cash from someone who doesn't want to be paid back. This issue will be printed on newsprint.

April 6. Carradice order came in, \$902 in duty and freight. Got my tax refund and will put that into the Rivendell account.

April 8. Built up the 54 sample for SS to ride. KM has the 59.5. Both have things not quite right with them—color, lugs, crown—but are pretty much geometrically right, which was the purpose of the samples. I'm loving the 56, and it's driving me nuts that they'll be so late.....I've got to finish this issue and get it to Lee for layout. It'll be a fatty, and I hope nobody squawks about the newsprint. The bulk mailing last time was a disaster—many people never received their RR, and if you are among them, let me know and I'll send it out. I'd prefer to do that with an order, only to save \$1.01 in postage, but either way, let me know.

April 11. Lousy day, I hated it. Bad news from Waterford about the road crown—the problem is simple enough, but the communication is difficult (the caster is Everest, in Taiwan, and before you squawk about THAT, let me say that Everest is as good as anybody in the world. Even NASA goes to Everest!). The plates need to be thicker, the waist radius needs to be bigger, there needs to be more metal all around the socket. Everest says that'll take a whole new mold, and that could take months, not to mention money. I don't even care about the money right now—I just want them to be right. Marc suggests using a Henry James crown for the first bunch of bikes, until the Rivendell is ready; and yes I love the HJ crown, but it wasn't part of the plan and I don't want to start settling. We're trying to get a time estimate on the latest version. I've got twelve orders for road bikes,

and how long will they wait? Another thing. I have a click in my bike that won't go away. I had it on my RB-1, I had it on my Ritchey, and now I have it on my Rivendell. It comes at the bottom of the stroke of the right crank. The BB is adjusted (it's a Ritchey ball-and-cone bb, but it was there with a Stronglight cartridge, too). I've lubricated the chainring bolts, it ain't the pedal, and no, it's not the frame. It's driving me nuts, and this Saturday I'm riding 90 miles up the coast.

April 13. I got 200 cast pewter headbadges today. From Zog's friend. They look like they were made in Northumbria in the 1300's or something, and I mean that in a good way. Spencer laughed nervously when he saw them. "They look heavy," he said, so I weighed on, and it's just 13g. I guess they look "as cast," which they are. They seem ready to go to the next finishing step, but there isn't one. Anyway, I like them. Somewhere in this issue there's a picture, maybe close by. We'll also get a cloisonné version, in about two months. "Too late!" I was screaming a month ago, but now they may beat the crowns.....Orders are falling off preCIPitously. A week or so like today and I've got to really sweat. I hear the Nitto order won't arrive until late May, unless I fly it here. Dang. Last time it took 3 weeks.

April 17. Got a fax from the caster indicating the new crown molds are finished—can it be? So fast? They were "speed-posted" yesterday, so I should see them soon. I need some good news and this may be it. This weekend I rode the bike up the coast, lots of climbing and descending, a good test, and it's the nicest bike, just so nice. I like it a lot. A seat post I was testing came loose, though. I soaked my Brooks saddle, but it's okay. The Lowsaddle Longflapper worked so well, kept everything dry in four hours of rain. I like those bags.



PERSONAL IRRITANTS

by Keith Mills

The way this column came about: I had written a rough piece about people who can't ride alone and have to **turn** every ride into a social event. Grant agreed with the idea and suggested I write it for real. And then it occurred to me. Yes, I really hate it when someone won't shut up during a ride, but in my weekly cycling activities, I come across a lot of things that bug me as much. So here I am, making a list, getting it all off my chest.

First, I have a couple of caveats. In a world of Newt Gingrich and Bosnian Serbs, there are things that bother me way more than anything in cycling ever could. **Also**, I realize that in my enumeration of pet peeves, I have become a snob and a scold.

So, let the scolding begin. This is the kind of stuff that I find most irritating:

- People who go for one ride and, unprompted, tell ten people about it (it should be the other way around).
- People who ride every once in a while and who are **so** well-rested that they start every ride at an insane pace. They don't make good riding partners.
- People who see mountain biking as an adjunct culture of the Grateful Dead. They don't make good riding partners either.
- Guys who get into cycling and say "No way am I ever going to shave my legs."
- The same guys who, after becoming more serious about the sport, shave their legs and make a big deal about it. Do it or don't do it, but please don't act like it's a crucible for your manhood.
- People who, when lined up at the start of the race, utter the famous words: "I'm just doing this race for training." Sure, it's supposed to be all self-deprecating, but it's really a calculated way to diminish expectations. Besides, the race is good training for everyone, one way or another. Anyway, a lot of races take place hours from anywhere, start at ungodly hours, and cost a few hours' wages to enter. There's got to be a nicer way to "just" train.
- Cyclists who disavow themselves of cycling's greenness. They see cycling as just another exercise in recreation and consumerism and may just as well be driving fast cars or golfing (if they aren't already).
- People who, while name-dropping European racers and companies, mispronounce those very names. (Bianchi with a long "a" or soft "ch.")
- Related offense: those who overuse Italian words. Most egregious example:

"Gruppo" for a collection of same-maker components. The word is "group." Maybe you can get away with "gruppo" if you're talking about old Campagnolo, but there are people out there who call Shimano STX a "gruppo"—or worse, a "groupo." Stop them now.

- The use of the word "bike" or "cycle" as a verb. (Hint: If you can't use it as a transitive verb ("I biked my RB-1 25 miles") it's not good.) "Ride" works here, and is a perfectly fine verb.

- The use of the noun/gerund "biking" in any context outside of "mountain biking."

- The term "hardtail" as it applies to mountain bikes without rear suspension. I've tolerated and occasionally welcomed the motorcycle influence in cycling, and managed to go along with the term "rigid fork," but "hardtail" is an ugly word that shamefully backhands every single rear-sus-less mountain bike.

- Lots and lots of other things that just sort of sneak up on me before I even notice how irritating they are. But this is cycling, so I try to be amused instead of irritated. There—I feel better already.

THE CHEAPSKATE II: RECYCLING SOCKS

Sock Tip #1: Socks as arm warmers.

1. Take a sock, preferably an over-the-calf one. Any weight, any material, nothing matters. Cut out the toes.
2. Stick the heel in your elbow, and ride away. Get colorful, mismatch them if you like or need to, try argyles, go black, pick a weight to suit the temperature. If you don't own any long socks, buy some for this purpose—they're way cheaper than arm warmers, and just as good. I've owned only three sets of store-bought arm warmers in my life, and I've used these home-mades for the last 20 years. I hope to sell arm warmers in the future, and on some level I think dressing right for this sport we love is a good thing to do....but most of the time I just want warm arms.

Sock Tip #2. Sock as seat bag.

Stuff your spare tubes and tools into a sock, twist it and fold it back onto itself, then strap it to the seat rails with a toe strap. Not as good as a No Tech Tube Tote, because you can't lay it out like a placemat, and it's not waterproof, but pretty good, anyway. You can carry things between the two layers.

Sock Tip #3: Sock as water cooler.

Use a cotton sock as a water bottle cover. Put the bottle down to the toe, twist and fold the excess sock back over the bottle to make a second layer, and soak it in water. The evaporation will keep your water cool for two hours on a hot day—especially if you start with ice water.

Z STUFF THAT WORKS

by Maynard Hershon (who, rumor has it, also writes for *VeloNews*)

Through the '70s, many of us rode plastic-based Cinelli Unicanitor saddles of one sort or another, mostly #3 Buffalo models. A few diehards rode leather Brooks saddles, heavy in that age of drilled-out alloy chain-rings, and even then looking vintage after decades in common use. A few more rode leather Ideales or foam-covered, plastic-based Ideales from France. Most of us, again, happily rode Buffalo Cinellis.

In those days, what was available in bike parts and accessories like saddles didn't change much year to year. Part of cycling's charm was that equipment was solid, serviceable and pretty much infinitely renewable. You fixed flats, repacked bearings, replaced chains and cables, restrung new, undented rims onto the same hubs, got your frame resprayed every few seasons... We didn't know the word "recycle," but we were clear on the concept.

Sometimes there were bonuses. For instance: new Buffalo Cinellis looked like they were suede-covered - but eventually, after long miles of sweaty contact with your black synthetic Kucharik shorts or your black wool Sergals or Moas, the roughness of the cover material wore away.

Then, your buffed smooth Buffalo model's lovely patina testified quietly that you were a bikie, the real thing. Note: it wasn't new stuff, just bought for big money, that made the impression; it was stuff everyone recognized, that worked. It was stuff you had and you used, like a burnished old Cinelli seat.

The Buffalo Cinelli era ended when, at Bernard Hinault's suggestion, we began to buy Selle Italia Turbos or identical racing Avocets, made by the same outfit. They're what you saw under our Santinis, Black Bottoms or Vigorellis in the mid- and late-'80s: Turbos.

We rode Turbos for years, not as many years, perhaps, as we spent on those Cinellis, but years. I couldn't count the miles I rode on 'em. Since those days I've borrowed Turbo-seated bikes occasionally;

my bottom remembers and adapts instantly. Great seats.

What's the point? Look for Turbos now. Besides battered ones serving as always under the butts of guys and gals who don't think much about saddles - or prefer to leave well enough alone, you'll find Turbos, plenty of Turbos, in buckets and boxes at bike shops marked "half-price" or "pick-one, five dollars."

Five dollars. What happened? Turbos were great saddles in the '80s. Our butts are no different in the '90s, except perhaps in areas that do not contact our saddles.

The rush of what passes for progress crushed the Turbo, I believe, buried that perfectly fine design under an avalanche of Lighter better quicker faster saddles that've

Part of cycling's charm was that equipment was solid, serviceable and pretty much infinitely renewable

made no (or next to no) difference in our lives. They didn't affect comfort (how would we tell if they would? We buy 'em without ridin' 'em). They didn't affect speed or Tony Rominger would be telling us he couldn't have done it without his Selle Somebody Superseat.

Let's be honest. Would our average ride speeds change at all if we rode Turbos or any other "obsolete" racing-style saddles you could name, instead of the pricy ultra-light units perched (until something lighter comes along) on our seatposts today? Probably not, huh? Would we be more comfortable? Would our saddles last longer? Do we care?

What did all that "progress" affect? Commerce - by enticing people who

already owned a saddle to purchase another. Silly as it sounds, racing saddles are a fashion item now. Buy this one; try that one, it matches your handlebar tape. Function's got nothing to do with it.

Frankly, my dear, I don't care what saddle you ride. What I fret about is the decreasing gestation period, the shortening interlude of owner satisfaction between irresistible urges for the new thing, the lighter better quicker faster thing.

I see a change in how bike riders relate to their bikes. At one time, I think, riders were proud to show up for the ride on their good-ol' bikes. More and more, to have that same proud feeling, we have to show up on an ever-evolving accumulation of the latest.

Our bikes are changing all the time. We're fussing with them continually, changing our positions, spending money and time we could use elsewhere in our lives. And for what?

I recall visiting one of the big Italian saddle makers. The owner told us about a pro he sponsored. The pro had crashed repeatedly so his saddle frame was no longer straight. But he liked it just the way it was. Each spring, instead of taking a new seat to replace last year's beat-up one, the pro asked the company merely to re-cover his crooked seat.

"Just the cover. Don't change the padding. Don't straighten the frame."

He knew he had something that worked for him. And he understood the value of leaving well enough alone. Many of us don't complete a season on the equipment we began with, the saddle we began with, the pedals and shoes we began with. Something new comes along, something seductive, something lighter better quicker faster.

Something that, in a year or so, you'll find in a bucket or cardboard box in your dealer's store, marked "pick-one, five dollars." Watch. See if I'm not right.

UNPARTICULAR..

Open Road USA has a new address and number. Remember, last issue we reported that this organization distributes *Encyclopedia* and *Bike Culture Quarterly*, two excellent, ads-free, intelligent bike publications. If you must know the real, total, absolute truth, it's what I wish the Rivendell Reader were. Yearly subscriptions are \$43. The new address is odd for an organization called Open Road, but I guess there are a lot of open roads down there: Box 291010 Los Angeles, CA 90029, and the phone number is 213 666-3500.

Is anybody else sick of David Letterman's meanness and how he uses people as props? He sends people off on goofy errands, asks them to do inane and embarrassing things, and they put up with it. It is rare that he treats any of his guests or his audience, or even Paul Schafer with any respect. I know, I don't have to watch. I don't anymore.

The July issue of *Bicycle Guide* will have a story on Rivendell.....Speaking of which, there are lots of Rivendells out there. There's a Rivendell Psychiatric Hospital in Michigan, a halfway house in Montana, a school in San Francisco, a community in Oregon, a woodworking shop in California. If you know of any others, let me know. I send our propaganda and T shirts and water bottles to them, and sometimes I hear back.....**GLOVES** should be back in stock by the time you read this. These are similar to the BOB gloves, arranged by the same saintlike Habib who did the BOB gloves, but with a few differences. I specified leather piping (let's see how it comes), natural color (should be greyish), and this time, no label, since that would have delayed things another

month.....**I have wool samples in and am working on jersey prototypes.** My purpose isn't to compete with Swobo, by the way—Tim Parr has done a great job with that company, and I wish him all the success he deserves. Buy Swobojerseys...but for every three Swobos you buy, try one Rivendell. The selection here will be small, but they'll be very nice. Sewn by a family right here in California. The same family that sews the new musettes.....Tim Mitoma, the Rivendell logo designer, has completed a painting that will eventually be a Rivendell poster. I expect it to be available in July, and if you send in your money now (to help defray printing), it will be \$10. Once they're printed, \$15. That's all I'll say for now. Tim will be profiled in the next RR.

Classifieds in the RR? I get lots of requests and have tried to say no up to now, but beginning the next issue, okay. Send in your stuff, I'll print it exactly as you send it in unless it's totally undecipherable. State year, size, color, any modifications, condition—everything you'd want to know before buying. You're on your own here, please. I'm not going to be intermediary, I'm out of the loop, this is a service only, and if you forget your phone number, expect few calls. There are far better places to sell a bike or look for one: *Cycle Seller*, Box 470478 Chicago, IL 60647-0478 (312) 292-9292 Fax -9296; and the new upstart, *The Bicycle Trader*, Box 3324 Ashland, Oregon 97520(503) 488-3157 Fax -4313.

Yenwatch: It's at 83 now (¥ per \$)—which means a dollar is just about worthless in Japan, which means all Japanese products are either going to get cheaper to keep the price, or go up in price. When I left Bstone,

I thought well, at least I won't have to worry about the ¥ anymore. Wrong—Nitto is my only source for Moustache H'bars and a few other things, and they are the best barmakers in the world (no apologies to nobody). The Moustache H'bars and all Nitto products have to go up in price, but they're still good values because I buy direct, sell direct. Mark them up the bare minimum to make it worth it, and that's your price. In 1972 one dollar bought 350 yen. In 1984 it bought 250.

The first All-Rounder will go to Chris Kostman, a longtime friend and supporter who, even though he hasn't had to pay full pop for a bike in years (he gets sponsored), is biting the bullet and paying the same price as you or me. Thanks, Chris.

Ariadne got a real job! Many of you know her as a Bstone marketing person, one of the nicest people I know. I'd love to hire her, but she needs to make more money than I can pay her, and so off she goes to work on bicycle advocacy for the city of Pleasant Hill (real name). She'll be around now and then.

Employee update: Spencer is still here, still working hard, such an asset, I can't thank him enough. He talks quietly on the phone, but that's just his way. He's smart and honest, and a pleasure to work with. Maggi is here a day or two also. She's not a bike person (she runs), but she's won't try to fake it, either. She's here because she's smart and honest, the most important requirements, and a pleasure to have around. She gets things done that I can't stand to do, and if she hangs in a year she'll learn a lot about bikes.

IF THE WORLD WERE A VILLAGE OF 1,000 PEOPLE

If the world were a village of 1,000 people, it would include:

- 584 Asians
- 124 Africans
- 95 eastern and western Europeans
- 84 Latin Americans
- 55 former Soviets (including Lithuanians, Latvians, Estonians, and other national groups)
- 52 North Americans
- 6 Australians and New Zealanders.

The people of the village have considerable difficulty in communicating:

- 165 people speak Mandarin
- 86 English
- 83 Hindi/Urdu
- 64 Spanish
- 58 Russian
- 37 Arabic

That list accounts for the mother tongues of only half the villagers. The other half speak (in descending order of frequency) Bengali, Portuguese, Indonesian, Japanese, German, French, and 200 other languages.

In this village of 1,000 there are:

- 329 Christians (among them 187 Catholics, 84 Protestants, 31 Orthodox)
- 178 Muslims
- 167 "nonreligious"
- 132 Hindus
- 60 Buddhists
- 45 atheists
- 3 Jews
- 86 all other religions

One-third (330) of the 1,000 people in the world village are children, and only 60 are over the age of 65. Half the children are immunized against preventable diseases such as measles and polio.

Just under half of the mamed women in the village have access to and use modem contraceptives.

This year 28 babies will be born. Ten people will die, 3 of them for lack of food, 1 from cancer; 2 of the deaths will be of babies born within the year. One person of that 1,000 in the village is infected with the HIV virus; that person most likely has not yet developed a full-blown case of AIDS.

With the 28 births and 10 deaths, the population of the village next year will be 1,018.

In this 1,000 person community, 200 people receive 75 percent of the income; another 200 receive only 2 percent of the income.

Only 70 people of the 1,000 own an automobile (although some of the 70 own more than 1).

About one-third have access to clean, safe drinking water.

Of the 670 adults in the village, half are illiterate.

The village has 6 acres of land per person—6,000 acres in all—of which:

- 700 acres are cropland
- 1,400 acres pasture
- 1,900 acres woodland

-2,000 acres desert, tundra, pavement, and other wasteland.

The woodland is declining rapidly; the wasteland is increasing. The other land categories are roughly stable.

The village allocates 83 percent of its fertilizer to 40 percent of its cropland—that owned by the richest and best-fed 270 people. Excess fertilizer running off this land causes pollution in lakes and wells. The remaining 60 percent of the land, with its 17 percent of the fertilizer, produces only 28 percent of the food but feeds 73 percent of the people. The average grain yield on that land is one-third the harvest achieved by the richer villagers.

In the village of 1,000 people, there are:

- 5 soldiers
- 7 teachers
- 1 doctor
- 3 refugees driven from home by war or drought.

The village has a total yearly budget, public and private, of over \$3 million—\$3,000 per person if it is distributed evenly (which, as we have already seen, it isn't).

Of the total \$3 million:

- \$181,000 goes to weapons and warfare
- \$159,000 to education
- \$132,000 to health care.

The village has buried beneath it enough explosive power in nuclear weapons to blow itself to smithereens many times over. These weapons are under the control of just 100 of the people. The other 900 are watching them with deep anxiety, wondering whether they can learn to get along together; and if they do, whether they might set off the weapons anyway through inattention or technical bungling; and if they ever decide to dismantle the weapons, where in the world village will they dispose of the radioactive materials of which the weapons are made?

Donella H. Meadows's "If the World Were a Village Of 1,000 People" appeared in the anthology Futures by Design: The Practice Of Ecological Planning, edited by Doug Aberly. Copyright 1994 by Doug Aberly. It is reprinted here by permission Of New Society Publishers, 4527 Springfield Ave., Philadelphia, PA 19143, (800)333-9093.

can feel it when you ride, and it doesn't cause any trouble. Besides, because of the angular contact in a cup-and-cone hub, the loads on the balls is increased by about 41 percent, and that adds a lot of friction, which is why our hubs outcoast all cup-and-coners. You know, Campy attorneys confronted us about an ad we ran that claimed our hubs were faster and smoother than Campy hubs, so we proved it by stating our case in VeloNews. Evidently it was convincing, because we never heard from them again, and we continued to run the same ad.

Cup-and-cone bearings are antiquated technology, found almost entirely in bicycles. Sealed bearings make simpler installations, are lighter, and in the case of hubs, they're smoother and faster, too. You probably can't find one set of cup-and-cone bearings in an automobile.

RR: *You said that to the right guy, but all I can do on a car is change a tire and fill it with gas. I don't like car-bike comparisons, anyway....the bike is always spoken of as the caveman cousin, or something. It's almost as offensive as describing something as "about the size of a pack of cigarettes." I can hardly even say that. Can we talk about something else? In the February 1982 (I think) issue Of VeloNews—way back before it began celebrating diversity in our chosen sport—there was a letter you wrote about riding in traffic. By today's standards it was the most un-PC thing imaginable, and even at the time I was surprised you signed your name to it, and that VeloNews printed it, and that you weren't burned at the stake in the following issues. I'd photocopied it, finally lost it, and when VeloNews was trying to sell Bstone some ads, I told Nancy, "We'll do it if you first find me that letter" (describing your letter and narrowing it down to three years). She found it, sent it, we advertised, and since then I've photocopied it and sent it to a couple dozen friends. I thought it was terrific, but I'd never have signed my name to it. Do you remember the letter, and did you get mail from it? Have your views changed?*

RD: Of course I remember the letter, and my views haven't changed at all. A healthy regard for the laws requiring us to behave as slow moving vehicles must be weighed against the instinct and desirability of staying alive in traffic. You should print that letter—

RR: *No chance. Let's talk about oval chain rings. You used to brag about how good they were, didn't you?*

RD: Elliptical rings were used a lot before the turn of the century—even Major Taylor himself used them. (Major Taylor was the fastest bicycle rider in the world in the '20s or so.—ed.) I just reinvented the things, and others have, too. At a cadence of 60 rpm, which is what a lot of people ride at, E-rings are superb. Your leg action is longer and more uniform. I can't get off a

I'LL ADMIT THAT IN ALL-OUT COMPETITION, THE REAR SUSPENSION MAY BE OF SOME VALUE, BUT FOR MOST PEOPLE I DON'T KNOW IF IT'S WORTH ALL THE WEIGHT, COMPLEXITY, AND COST.

round-ringed road bike soon enough.

RR: *What about BioPace?*

RD: Shimano oriented the ellipse all wrong. The way they had it, the crank took a long time to go over the top, and just whizzed through the section where the legs are effective. It was designed by a track racer, and it may have been okay at really high sprinting speeds, where the only sections for input are at the top and bottom. But {at normal pedal speeds} it never made any sense that I could see. I like regular E-rings, even though they don't work well with front derailleurs. But E-wheels aren't effective above about 80 rpm, because you can't keep up with the pedals beyond that speed. But on long rides, my knees used to get sore at about 80 miles, and the sore knees vanished when I switched to E-rings, even on triple centuries.

RR: *Well, I don't remember sprinters favoring BioPace, but maybe its benefits kicked in at greater than 130 rpm. Anyway, let's end this by talking about something contemporary. What do you think about suspension?*

RD: Well, the most comfortable saddle I ever had was on a 1937 Harley VD. It had

a had a wide, firm saddle that pivoted up in front and a long coil spring underneath. The whole bike hopped up and down, but you never felt it where it counted. The saddle floated along as though it were on a cloud. You could ride one of those Harleys forever.

Then came the infamous Norton Featherbed, with swinging arm rear suspension and telescopic front forks. Now, the wheel stayed on the pavement, but the rider bounced up and down. Saddles became harder and harder, and road holding improved, and riders adopted a new way to sit on the rock-hard plastic saddles—tipped forward in a way to give a chiropractor a fit.

The result of all the progress in suspension and seating is, of course, that nobody uses motorcycles much anymore, particularly on long rides. The same is happening with mountain bikes. Too little real thinking is going into them.

If you have a heavy motorcycle, swing-arm suspension makes sense. If the main weight is on the bicycle rider, and the rear end of the bike itself weighs, say,

20 pounds, you might as well regard the entire rear end of the bike as a swing arm, and dispense with the rear suspension entirely—just use a sprung saddle, instead. I'll admit that in all-out competition, the rear suspension may be of some value, but for most people I don't know if it's worth all the weight, complexity, and cost. My own mountain bike has an unsuspended rear and a Brooks B66 saddle with coil springs under a leather saddle wide enough for anybody. I like it. The coil springs make a big difference.

Current suspension bikes are really just motorless motorcycles. I think there should be racing categories according to what type of bike you ride—one for suspension bikes, one for regular bikes (but allowing sprung saddles and flex-type stems).

As humans, we have an absolute love of mechanical complexity, but we aren't good at fixing things. Front suspension is good for downhill racing, but it's too complicated for me. I enjoy the challenge of a long hill climb, such as up Mt. Wilson. Coming down, I'm too tired to take daredevil chances. I just want to get home in one piece, so I can lie down.



Advance Warning

by Ted Costantino

If further evidence were required that human behavior varies markedly between the coasts of this great land, consider these statistics, gleaned from the Los Angeles Times a few years ago when I happened to be working out there: In **1986**, I believe it was, cops in Los Angeles wrote something like 44,000 tickets for jaywalking. In New York City that year, they wrote seven. In Boston, zero.

So remarkable are these numbers that they've stuck in my head ever since. Consider the extraordinary unlikelihood of even finding 44,000 pedestrians in **LA**, never mind 44,000 of them determined to saunter off curbs mid-block in so flagrant a matter as to stir the local constables to action.

Just as remarkable is the unblemished record in my adopted hometown of Boston, a densely packed city teeming with pedestrians. Here, the intestinal avenues are virtually impossible to navigate in any way except on foot or bicycle. Imagine—in this city of the blind alley, the crooked lane, and the triple-parked impassable thoroughfare, not one citizen so much as dipped a dainty toe into the crosswalk against the light.

Of course, any visitor to these places knows that neither scenario is accurate. Interestingly, however, one thing that Boston, Los Angeles, and many other cities do have in common is a law that requires vehicles to stop for pedestrians.

How effective are these laws? It depends on where you live. First-time visitors to California are unfailingly amazed by the alacrity with which cars there will ooze to a halt when a pedestrian's foot hits the zebra stripes.

In Boston, other the other hand, the simmering war between car and man has boiled over into armed combat. The past three years have seen multiple crosswalk skirmishes where the Hub's pedestrian mobs have actually broken the windows of an offending jalopy and pulled the hapless driver to his doom.

The visceral loathing any self-respecting pedestrian quite rightly feels for every car on

the street is beginning to spill over onto other offenders. And more and more, those offenders are cyclists.

First among these are the hordes of idiots on two wheels who cut through crosswalks, or clip along sidewalks, or barrel through pedestrian phalanxes the wrong way on one-way streets. They piss off people so much that cars seem almost benign by comparison. Indeed, if it weren't for the fact that the vast majority of these granny-skewering **nitwits** were pedaling Murrys with rusty chains and a death-rattle of loose parts, allowing ample **warning** of their approach, the impact ratio would be far worse.

Second are the graceless chops of inexperienced couriers, who have yet to master the city glide that lets the pros **skim** the streets with barely a ripple as evidence of their passing. As the novices learn their trade in public, they leave a furious wake of bumped, nudged, and scrambled victims aching for revenge.

So whether you are one of the witless or one of the wise, this dispatch from Boston's battle front may be worth heeding: Your personal actuarial chart will take an uptick for the better if you make it a habit to **stop—yes, stop—for pedestrians**.

I'm not saying you should pull up dead, foot down, for red lights or right turns or anything. You'd never get anywhere that way. But I am saying you might yield, if not wobble into an approximate track stand, for every pedestrian who crosses your path at a legitimate crosswalk or obvious right of way. Even the ones crossing against red lights. Look, if you run reds, why can't they?

Observing this simple civility brings the world into balance. Traffic flows smoothly. Mothers, children, and dogs are safe in their neighborhoods. People have one less glowing red coal of hate in their hearts for you and your bike.

You still get where you're going almost as fast as your little legs can spin, and everyone gets to live another day.

THE SPEED ROBBERS

by Jim Papadopoulos

SPEED ROBBER NO. 1: WIND

On a level, smooth road, the main drag is air resistance, and the faster you go, the worse it is. Riding 23 mph rather than 22 mph takes about **14** percent more power, which explains why headwinds are *so* debilitating. A headwind of 0.75 mph *will* cut your speed by half a mile per hour, unless you put out **7** percent more power to fight it. A **6** mph breeze cuts road speed by about **4** mph (or calls for double the power to maintain). A stiff wind of 20 mph cuts ride speed from 22 mph to a grinding 11 mph.

The best way to fight the wind is to sit well on the bike, or cheat with a fairing. Elite racers have the luxury of being tested in wind tunnels, *so* they can fine-tune their positions with the benefit of objective and immediate feedback. Greg LeMond's position is reputed to be *so* good that his air drag increases when he's actually more aerodynamic without a fairing! Assuming your goal is to minimize your air drag (maybe not a safe assumption to make here in the *Rivendell Reader*), short of getting a fairing, you can ride with your elbows tucked in, maintain **low**, flat back, and keep your upper body as motionless as practical. It takes practice to be comfortable this way, but that's the secret.

SPEED ROBBER NO. 2: HILLS

A hill's slope is measured in percent: **An** eight percent slope rises eight feet for every hundred feet of travel, and *so* on. You begin to notice things at 3 percent; you grunt at 8 percent, cuss at 12 percent, get off the bike and call it quits at 25 percent.

The nice thing about hills being rated by percent gradient is that you can figure out the resistance right away—just multiply your weight times the slope percent.

A slight upgrade doesn't affect speed as much *as* you might think. When you slow a little, air drag drops disproportionately, *so* you maintain power (force times speed) with relatively little slowing.

On steeper hills you're going *so* slow that air **drag** isn't a factor. **If** the hill is short, you may put out double or quadruple the power for a short time (even above 1 hp for a few seconds). **So** it may be possible to

climb a few hundred yards of a **3** percent hill at 22 mph, or 50 yards of a 12 percent hill at 16 mph.

Probably you can see that on a substantial hill (6 percent or greater), reducing equipment or body weight can increase your speed. But even here, a relatively large percent weight reduction makes a relatively small percent difference in speed; and whether the difference makes any difference depends on whether your goal is to break your PR by a second or two up the local two-mile hill, or just have a good time riding without feeling weighed down.

Whatever the case, weight is far less consequential on level ground. Roughly speaking, if I could drop 10 percent of my current bike-plus-body weight from **240** to 216 lb., then a 'speed of 7.7 mph would increase to 8.5 mph. But on the level, weight loss without fitness or aerodynamic gains will have little to no effect on speed, except during acceleration.

SPEED ROBBER NO. 3: ROLLING RESISTANCE.

Tires resist rolling when they deform at the point where they contact the road, and the rolling resistance is usually expressed as a percentage of rider weight. Knobs that bend, and all knobs do, increase rolling resistance. But as a rider on the road, it's doubtful you can detect differences between two comparable brands or models. **A** her-ringbone tread versus a file tread or a slick? Theoretically a slick **is** faster, because it'll scrub and squirm less; but in the real world you'd have to be inhumanly sensitive to tell the difference.

You probably already know that skinny, hard tires reduce rolling resistance, *so* maybe you pump your tires as hard as a rock. Not good! Rolling resistance tests are carried out on smooth steel rollers, but we ride on roads, not welded steel rails. **A** super hard wheel jars our bodies around and bumps **us** into the air, which is no way to reduce energy loss. **A** softer tire deforms and rolls over bumps, rather than hitting them and bouncing up, *so* you keep more of your speed. Also, the softer tire beats you up less, and *so* over twenty miles or *so*, you feel less

worn out. That's got to help.

Suspension losses are pretty hard to evaluate experimentally, since they involve special unconscious "body English" motions that riders perform. If you ever ride your bicycle in the dark and hit an unexpected bump, it will almost knock you **off**. To simply evaluate a tire's suspension behavior on a machine, it is necessary to be very careful about the masses and springs used to press it to the "bumpy roller." **As** far as I know, nobody has looked into this yet.

As far as I'm concerned, every bump you feel implies a small loss of forward speed, so we need a compromise between hard tires and soft ones. My guess is that compliance in the handlebars and saddle is good for efficient riding since it reduces the disturbances due to bumps, without increasing rolling resistance.

SPEED ROBBER NO. 4: DRIVECHAIN FRICTION

A clean, smooth-running chain is 97 to 98 percent efficient; it absorbs 2-3 percent of your power, (That efficiency actually depends on which sprocket it rides on. Since the quoted efficiency doesn't identify a particular sprocket, "your actual numbers might vary.") **So** in spite of **all** the attempts over the years to improve upon this most ancient form of bicycle technology, the lowly, hideous thing-of-grease-and-oil, has taken on all challengers and won.

I think it's reasonable to be content with 98 percent efficiency. Trying to make the chain 100 percent efficient doesn't seem **all** that worthwhile, as it would make the most difference (even then, very little) on steep hills.

Just keep your chain clean and well lubricated, and you won't have to worry about it sapping your road speed.

WRAP-UP

The best ways to reduce drag are probably body position, a well-lubricated chain, and a good choice of tires. Weight savings are far less consequential on level roads than on hills, and even there, most people can better afford, in more ways than one, to reduce body weight than bike weight.

GETTING FIT

by Steven Sheffield

Buying a new bicycle isn't as simple as it seems. Most of the decisions have been easy; I knew I wanted a lugged, steel, Campagnolo-equipped road bike. What I didn't know was what size frame and whether or not I needed a custom frame. I had an idea of sizing—something like a 52, with a 73 degree seat tube and a 54cm top tube. I wasn't really sure, *so* I investigated several different methods, formulas, and dealers to find out more.

The Hinault/Genzling method, plugs body measurements into a series of formulas. Basic frame sizes are found by multiplying your inside leg length x 0.65, which says I should be riding a 55cm frame, center to top. This is a lot bigger than what I'm riding now, and didn't sound right, *so* I went to a few different bike shops to get sized by people experienced in fitting.

Many shops in the Bay Area use either the Fit Kit or the Serotta Size-Cycle—if not both—to determine frame sizes. The Fit Kit cross-references a series of body measurements in a large notebook to determine frame size and angles. The problem is that this provides only ranges. For example, the Fit Kit told me I could ride anywhere from a 52 to 55cm frame, which I already knew.

The manager of one shop—which does only Fit Kits—told me, “The Fit Kit is good for determining a baseline, but there are too many variables involved to take the numbers literally. It isn't a perfect system, but it gives the customer an idea of the proper size.”

A second shop, which sets people up on a Serotta Size Cycle after doing a Fit Kit, agreed. “After several years of fitting, I can tell what size a customer needs when he walks in the door. We start out with the Fit Kit, then test it on the Size Cycle. Using the Fit Kit alone doesn't make sense—it was designed for racers and experienced riders, and doesn't take a rider's flexibility or strength into account.”

After measuring me, they had me get on a Size Cycle and start pedaling. A few nudges to the positioning here and there, and I was present-

ed a series of numbers which were within both the Hinault and Fit Kit's range.

Unfortunately, what felt comfortable on the size cycle didn't translate into real world comfort. I test rode a bike that closely matched, but it just felt too big.

So off to a third shop for yet another fitting. After measuring my current bike's saddle height, they set up the Size Cycle with a basic 54cm seat and top tube, 74 seat degree angle, and 170mm cranks. I got on the bike and started pedaling easy. We raised the stem to change my upper body position, lowered the post, relaxed the seat tube angle, and lengthened the stem to make the reach longer.

Everything felt great, and I was given these numbers: 54cm seat tube, 73 seat tube angle, 55cm top tube, 170 cranks, 11 to 12cm stem, 42-44cm bars. Slightly smaller than the Hinault numbers, but well within the range offered by the Fit Kit, and similar to Fit Kit/Size Cycle. I test rode a bike within this range, and it felt great. I didn't feel quite stretched out enough, but a slightly longer stem could ~~fix~~ that.

So now I had a good idea of the size and geometry I needed. I also learned that none of the so-called objective sizing methods is perfect.

The Serotta Size Cycle seemed to work the best for me, but not everyone using it *will* agree on the results, *so* it's not perfect, either.

The procedures are worthwhile, but they can be expensive. If you're on a budget, find a willing partner to help measure you, using the Hinault method, then test ride bikes within the range offered. The Fit Kit can be helpful, but it's no more accurate than the Hinault method. One distinct advantage is that the person doing the Fit Kitting *will* have experience, which can lead to better results. I think the Serotta Size Cycle is best, but even it can give different numbers depending on the person performing the procedure, *so* it's not perfect either.

Each method ~~will~~ narrow the search, but riding is ~~still~~ the best way to find out your best fit.

THE HAPPY RIDER

THE COURIER BAG FROM COURIERWARE

It's American!

I've had mine in constant use for 3 years and you can't tell. It's waterproof enough to sit in a slushy puddle and still keep stuff *dry*. It sits nicely across the back when loaded and keeps the shoulders clear *so* they can sweat. It slides under airline seats as carry-on luggage. Tested by Boston's best couriers in the harshest conditions. I got the big pack-rat version but they make of range of bags from \$35 to \$90. And they're made by a super-nice retro-grouch bike riding married couple who keep fenders on their bikes year round. Call for the brochure.

Courienware 617 876-2300
John Morrell

THE PLETSCHER RACK

It's Swiss!

The classic Pletscher rear rack has become an indispensable component on my everyday get-around bike. The rat-trap style spring-loaded retention device is more convenient than a bungee. I routinely and securely carry three large Domino's pizzas (thin crust, pineapple) using only the rat-trap. The Pletscher is not *as* strong as a Blackburn and is frowned upon by some for looking kinda nerdy (although this appeals to me). They cost about half as much as a Blackburn and are infinitely more stylish, being European and all. I wouldn't use it for any cross-country expeditions, but on cross-town expeditions, hauling the RivReader down to the coffee shop and as a place to hang my saddlebags, it's a pletscher to use.

—Mark Manson

KRAZY GLUE GEL

It's Synthetic!

This stuff works. It has a nice thick consistency that's great for repairing tread cuts—just remove the tire, pinch open the cut and work the glue in, using a pin or something. Close the hole and let it dry overnight. You can sand off the excess after it dries, or not. To make cheap, effective chainstay protectors or brake lever grips, cut strips of trashed inner tubes, wrap them around tightly, and glue the ends (rubber to rubber). Feel like putting those cool-looking laces from your D. Martens on your 6-hole Detto Pietros? Lace them up, then slide onto the ends half-inch shrink-to-fit tubes, available at Radio Shack. Then dab the ends with Kazy Glue Gel and slide the strips back up. You can also make cable end caps this way, but if you glue them on you won't be able to take them off. (Not *so* with beeswax—ed). I also use it for glueing anti-skid heel pads on cycling shoes, using a D-shaped section of an old tire.

T. McMahon

MAVIC MA-2 700C RIMS

They're French!

The Mavic MA-2 is a polished version of the ever popular MA-40. It combines moderate weight with great strength, but costs much less than its hard anodized brother (and there is no coating on the sidewalls to wear off and look lousy after just one ride in wet, gritty weather). Don't let the paltry price of this rim lead you to believe that it lacks any of the qualities that have made the MA-40 one of the most popular rims ever made; I can't find any difference.

Also, the MA-2's mirror polished finish is simply beautiful. It makes any bike look better, even the fanciest of chrome-and Campy Italian road machines. Truly one of the best products ever made.

Jeff Leary

MICHELIN HiLITE TOUR TIRES

They're French

They're fatties, 700 x 35—but they're pretty light for such volume, just 360g, and they make your road bike into a go-any-wheremobile. Not all road bikes can fit these tires. I have five bikes and the only one that will swallow up this tire is a late 1970s sport-touring model (remember that name?). Consequently, that's the bike I ride all the time. I've taken these tires on everything *from* fast road rides to rough fire trails, and I've never gotten a flat (pinch flat or puncture). I realize I've just jinxed that record, but it will have been for the good cause of helping my fellow rider. You can get these tires in progressive bike shops or mail order. They're about \$20 each.

Joseph P.

SACHS NEW SUCCESS

It's German!

A pleasure to work with straight out of the box. Front and rear derailleurs are cold-forged aluminum, *so* you know they're strong; and all the pivot points have bushings for smooth movements and a long life. The ErgoPower levers have a positive feel, and even have bearings on the internal mechanism. The Maillard-Aris freewheel (Sachs bought Maillard, the freewheel maker) and the Sedis R80 chain (ditto Sedis) results in quiet shifts and good performance under the harshest conditions. I like the sealed cartridge bearing hubs. I ride a lot with teammates throughout the snowy and rainy Wisconsin winters, and these require a lot less maintenance. The brakes stop well consistently. The group retails for about \$1,050, and lacks *only* the seat post, bottom bracket, and pedals. For more information, contact Sachs Bicycle Components, 22445 La Palma, Suite J Yorba Linda, CA 1800 343-8586 or fax (714) 692-2638.

JOHN SEGAL

MEMBER PROFILE

Many months ago I got an illustrated letter from this guy, ex-BOB John Segal. "he writing and the pictures were small and interesting, and the handwriting was unlike any I'd ever seen. He's an artist, and suggested doing some kind of work for Rivendell. My first reaction was "It looks nice and I really like it, but it's not the style I want. A little dainty. " I found myself going back to look at his envelopes and sketches, and realized Rivendell had to have this guy do something. I'm still not sure what that'll be, but in the meanwhile, meet John Segal....

RR: How old are you and what's your situation?

JS: I'm thirty-six, married, and have a six-year old girl and a three and-a-half year old boy. I live near Central Park, in New York City.

RR: How come you draw so small? How did that start?

JS: It's always come natural to me. As a kid I was into building car models and HO scale slot cars. I was so comfortable working on little things that my Mother suggested that I become an orthodontist.

RR: To work on little teeth?



JS: Or something. But I went to art school instead. Even at art school, despite my teachers's protest, I worked small. I'm still working in HO scale.

(HO scale comes from model railroading. It's small. — ed.)

JS: While I was an art student, I discovered the work of Donald Evans, an American artist who painted nothing but postage stamps. They were the same size as



actual stamps, but they depicted imaginary countries. He died in 1977, when he was thirty-one, at a fire in an Amsterdam hotel.

RR: Do you have your own studio?

JS: I have a home studio, and it's a good thing. I keep irregular hours, and when I used to work outside the house, my wife said she never saw me. Now she sees me all the time, but I'm always working.

RR: Who buys your art?

JS: Magazines, mostly, like *Forbes*, *Gourmet*, and *The Wall Street Journal*, which is a newspaper. Also, I've started illustrating children's books—

RR: "hat seems like a goodfit.. .

JS: —and my first book, *This is Maine* will be published this spring, by Henry Holt & Company.

RR: What kind of work do you like to do the most?

JS: Anything that comes without a deadline. There's something exciting about sitting down at my drawing board and in a few minutes (sometimes hours) creating a perfect jewel of a painting. The collage artist John O'Reilly, who also works on a small scale said it best: "Big paintings sell and they fill space...That's not my style. I'm trying to

compose in an area I can defend."

RR: What are you working on now?

JS: Two more picture books for children, to be published next spring, and some self-directed projects—a series of cows, and a series of botanical studies. A Japanese department store commissioned me to paint some flowers and design packaging for them., and the Museum of Modern Art is interested in some botanicals to use for a line of note cards.

RR: How did you come to like bikes?

JS: I grew up in the 'burbs. Everyone had a bike, and most of them came from the local Schwinn dealer. I went from a Stingray Junior to a Stingray Fastback, and finally to a Varsity. I loved that bike until Stuart Dearden got what was then known as an "English Racer." I think it was a Raleigh, with impossibly narrow wheels and a Brooks (I assume) saddle. It was gorgeous, and fast, too. About ten years ago, after yet another running injury, I got a bike for fitness riding—a Peugeot, with a Vitus frame, Simplex derailleurs, and a Stronglight crank. It was very pretty, very light, and seemed to be poorly made—at least it was crude in its details.



RR: Have you ever done any bike work?

JS: Not for a bike company, if that's what you mean. I do work cycling images into my work whenever possible, though. Bikes make good metaphors. A drawing I did for AT & T showed two executives on a tandem, laboriously making their way up a steep hill, and this was illustrating teamwork. Corporations love that stuff.

THE DANISH DAGGER STORY

by *Errett Callahan*

DOES A STONE KNIFE REALLY WORK? DON'T EVEN ASK. THAT'S LIKE ASKING IF WE REALLY MADE IT OUT OF THE ICE AGE. OF COURSE WE DID, AND WE DID IT USING STONE KNIVES. OBSIDIAN, FLINTS, CHERT, AND CERTAIN OTHER MATERIALS CAN BE SHAPED INTO HIGHLY EFFICIENT CUTTING TOOLS BY CONTROLLED FRACTURE, A PROCESS CALLED FLINTKNAPPING— THE ANCIENT CRAFT WHICH GAVE PEOPLE THE EDGE IN SURVIVAL. OF ALL FLINTKNAPPING MATERIALS, THE MOST PRIZED IS THE NATURAL VOLCANIC GLASS, OBSIDIAN. BECAUSE OBSIDIAN FRACTURES TO THE LAST MOLECULE, IT IS CAPABLE OF AN EDGE 500 TIMES SHARPER THAN STEEL. IT DIVIDES, RATHER THAN TEARS. IT IS HARDER THAN STEEL, TOO, AND WILL HOLD AN EDGE LONGER ON SOFT MATERIALS. THESE QUALITIES HAVE MADE OBSIDIAN SCALPELS USEFUL IN SURGERIES WHERE FINE CUTS IN DELICATE TISSUE ARE THE ORDER.

Thirty-eight hundred years ago in Scandinavia, the onset of the Bronze Age brought the Stone Age to an abrupt yet glorious end. Perhaps “abrupt” is a bit harsh, since the death blows were all dealt over a 100-year period between 1800 and 1700 BC; but “glorious” is an understatement. For when the stone craftsmen of Denmark suddenly found themselves competing against knives made from bronze, the new miracle alloy of copper and tin, their skills soared to unprecedented heights. The stone daggers produced during this period are the epitome of the flintknapper’s art.

During the Dagger Period of the Late Neolithic era (2350 - 1700 BC.), styles evolved slowly and followed long-established tradition of shapes and sizes. The blades were wide in the middle, and the handle had parallel sides. Bronze knives, though, were wider down near the handle, and the handle had a flared base. Soon enough, the shape of Danish daggers began to mimic that of bronze knives.

But there was more than mimicry going on. The stone knives were being refined. The tool makers were adding purely cosmetic touches unduplicable in bronze, such as the particular way in which the sides of the handle and base were finished off, and the zig-zag “stitching” seam flaked up the center of the handle. They were playing offense as well as defense, and were evolving from toolmakers to artists. In the previous types, the handle was the most sloppily worked part of the dagger, probably because it was covered with leather or cordage wrapping. But with Type IV, the wealth of details on the handle indicates that the **grip** was probably uncovered, just like the handles on bronze daggers.

But mimicking design elements of the bronze knives wasn’t the only thing that changed the stone daggers. Competition among themselves forced the flintknappers

to hone their craft, and for a while, flint daggers proliferated. Daggers of one type or another were traded all over the Baltic and as far away as England, Russia, and Austria. Then, when people learned how to smelt bronze locally, the art of flintknapping ceased altogether. But for awhile there, the Danish flint smiths brought the art of flintknapping to its zenith. Samples such as the Hindsgavl dagger are a national treasure of Denmark today. With all its beauty, complexity, theme, variation, crescendo, and finale, the Danish dagger has been called the stone equivalent of a Beethoven concerto.

Exactly how the Neolithic flint daggers were made has been the subject of my personal research for the past 15 years. No production site has ever been discovered, so I’ve traveled to Scandinavia seven times to search the museum storerooms for clues. During this time I’ve produced more than 150 replica attempts.

For most of that time, I hadn’t a clue as to the sequence of manufacture, but I suspected there were seven basic stages a flint nodule must go through on its way to becoming a finished dagger, and I worked out my own method by experimenting.

Then on my last trip to Denmark, I discovered in the archives of the Danish National Museum in Copenhagen, three previously unknown preforms (unfinished daggers) which cast a brilliant light on the procedure. Except for minor details, it was just as I’d suspected, but now, finally, I had solid evidence.

As a result of a grant made possible by the King of Sweden, I spent the summers of 1993 and 1994 in Denmark and Sweden unlocking the last secrets of the dagger production code. Now it’ll take several more years to write it up into a formal research report. Then my 15 year search will be done and I can share the results.

HOW TO FLAKE A DANISH DAGGER

In flintknapping, the generic term for shaping stone tools, you remove and shape stone by two methods. One way ispercussion, or striking it with another object such as another rock or a heavy antler billet. The other way, which is more germane to this story, is pressure-flaking, where you push on the stone, generally with an antler or, as the Danish flintsmiths preferred, a copper rod inserted into a stick.

THERE ARE SEVEN STEPS IN THE MAKING OF A DANISH DAGGER FROM A BLANK.

1. BLANK.

Obtain an edge (55° to 75°) where there is none. Focus on the outer zone, not the base. I do this by direct percussion.



2. ROUGH OUT. Obtain a regular, symmetrical outline like that of a hand axe, with generous lenticular cross-sections, but with a nearly parallel end.

Focus on the middle and central zones, keeping the outer zones controlled, the edge straight and centered.

Mostly percussion, again.



3. PRIMARY PREFORM. Obtain a tapered longitudinal cross-section while maintaining lenticular lateral cross-sections, sub-parallel-sided handle are, and symmetrical outline.

Focus on the central zone, keeping others in check. Start to work on the base. Bring the blade outline to within about 1cm of the tertiary preform outline.



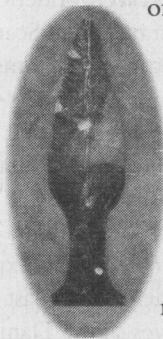
4. SECONDARY PRE-

FORM. Obtain a controlled, symmetrical outline to within 0.5 to 1.0cm of the eventual outline. Maintain a long, tapered longitudinal cross-section, but with the top of the handle becoming increasingly offset above the bottom face, and with the widest part of the obverse blade area becoming abruptly flat just below the handle taper. Constrict the handle and finish with a pronounced ridge pressed or punched on the obverse side. Gradually thin the blade to within 1-2mm of the ground preform. Square the base and press flakes on either side of the handle ridge.



5. TERTIARY PRE-

FORM. Grind at least 95 percent of the blade area, and dull the bevel the edges to prepare for the forthcoming set of flake removals. Try not to nick the edge.



6. GROUND PREFORM.

By pressure flaking, obtain a straight-in, parallel-flaked blade surface. Begin on the reverse face at the left handle-blade transition and work left to right toward the tip. Then, on the right side, work from top toward base. Repeat on other side.

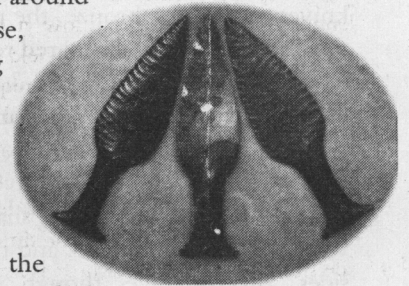


7. RETOUCHE PREFORM.

Trim the blade edges to create a straight and centered, low-angle sharp edge and symmetrical outline. Strive for triangular flakes with minimal intrusion into the main body flakes. Straighten and align the edge, trim the handle. Create finely controlled, zig-zag seams with evenly spaced, abrupt, backwards pointing flakes, beginning at the base and working forward to the handle/blade transition. Aligning and straightening the base edges, then flake a seam around

the base, flaking left to right, right to left. Then abrade the

handle until it's quite dull. A finished dagger is approximately 220MM long and takes me from 15 to 20 hours, with 17.7 hours being the average. The triad above shows a plastic casting of the Hindsgavl dagger, the finest specimen ever found (R); a ground preform (C) and my finished dagger (L).



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RIVENDELL FRAMES

METAL, REYNOLDS 753 TUBING, LUGS, CROWNS, & OTHER THINGS

Most high quality steel bicycle tubing is chrome molybdenum steel (CrMo). Reynolds' 753 is manganese-molybdenum steel, like Reynolds' famous 531. In fact, 753 is just heat-treated 531. The heat treatment dramatically increases its yield strength and tensile strength without adversely affecting its elongation.

Yield strength, tensile strength, and elongation are standard metallurgical tests, and are determined by pulling apart a two-inch solid bar of metal, as in a tug-of-war.

Yield strength is the amount of force required to stretch it to the point where it doesn't spring back to its original two-inch length. Paper clip steel has low yield strength; spring steel has high yield strength.

Tensile strength is the force required to pull apart the solid bar of metal until it breaks in half.

Elongation is the amount the bar stretched, relative to its original length, at the time it broke in half (at the time its tensile strength was exceeded). It is listed as a percentage: If the stretched piece measures three inches, the elongation is 50 percent, because the one-inch difference is 50 percent of the original two-inches. Materials with low elongation are glass, ceramic, sunbaked plastic—brittle things.

Frames aren't solid and they aren't stressed that way exactly, but there are similarities. For instance, bending is like stretching. So knowing a material's characteristics is a good starting point, at least. In most materials, the higher the tensile strength, the lower the elongation (the more brittle it is). Plate glass, for example, has a tensile strength is 500,000 psi—about 5x that of CrMo. But it doesn't fail in tension, it fails because it isn't tough—it cracks easily, and cracks just zip right through it.

Another issue is fabricability. For a metal to be suitable for bicycle frames, you've got to be able to build a frame without

overdraining the material's yield strength, tensile strength, and elongation. Once you've eliminated the unacceptable materials, the key is a good design, and maintaining the inherent properties of the materials throughout the building process. No less an authority than frame builder Richard Sachs has said, "In bike-making, material is the least consequential thing on the planet." An exaggeration, but it makes a good point.

That said, it is hard to imagine a more perfect material for bicycle frames than Reynolds 753. Its flex characteristics are ideal, it resists cracking, and if a crack does develop in it, it will grow slowly and offer plenty of warning. These qualities allow a builder to design in a certain amount of flex, so the bike feels alive and essential. Admittedly, "alive" and "essential" are unquantifiable terms, but I think a certain amount of springiness feels good.

LUGS, AESTHETICS, SENTIMENTALITY, TRADITION, STRENGTH, OPINION, STRESS DISTRIBUTION, HEAT, AND THE HOBO

I like frames that look quiet from a distance, and reveal their fanciness only upon closer inspection. More in the French tradition than the English, in other words. The tubes should be round and nondescript, and the joints, since they suffer the most, deserve the most artistic attention. They should look interesting, attractive, smart.

I also like the idea of a fine frame being identifiable by brand, even without its paint, decals, and head badge, if it happens to wind up in a junkyard 100 years from now. In the case of Rivendells, I like to think that in 2095, a hobo art connoisseur could saunter by, see the frame, pick it up, be drawn to the joints, and say "Oh-ho! An old Rivendell..." This is not a quest for immortality or anything strange like that; I just think there should be something there that can't be sandblasted off.

Some people don't get sentimental about frames, but I do. Others go bananas over

faded neon/chrome flames-from-hell paint, and the spartan, industrial look of TIG welds and gussets, but I don't. I recognize that the best welders are true craftsmen, and I respect their skills, and there may be a TIG-welded Rivendell some time. Rivendell is not anti-TIG. But to me, lugs honor the craft of the builder and the tradition of the frame, and I see no point in apologizing for that.

It is true that good frames can be built without lugs, so in that sense lugs are unnecessary. By the same token, so is every piece of artwork that's ever been created.

It used to be that even cheap bikes were lugged, and those deep-socketed, straight-cut lugs inspired, if not a second glance, at least a certain confidence. But during the past fifteen years, the push for flexibility in designs and lower costs has pushed even the most revered Italian and American names to TIG welding, and as a result, so many lug makers have closed up shop. The latest casualties are Japan's Eisho and Nikko. Maybe you haven't heard of them, but if you've ridden a lugged Nishiki, Univega, Centurion, Schwinn, Raleigh, Bridgestone or Panasonic, chances are you've ridden their lugs. I'm afraid that in a few years, lugs on new bicycle frames will be as scarce as arrowheads in a Yosemite campground.

Of all the popular frame building methods, silver brazing with lugs takes place at the lowest temperature—1200°F, compared to 1600°F for fillet brazing or lugs with brass; 2200°F for TIG welding—so it leaves the metal's mechanical properties in tact.

Lugs play a structural role, too, as external butting. But lug design is critical. A poorly designed lug takes too much time to heat, and concentrates stress in areas that cannot handle it. A well-designed lug supports the joint and distributes stress, and all the Rivendell lugs were designed with this in mind.

Sometimes you hear the comment that lugs add weight, an argument that's easily sold, since lugs weigh more than no lugs. For the record, a lower head lug on a

Rivendell All-Rounder weighs 26.5g—less than an ounce. For all it does in terms of joint strength, tubing compatibility, and pure aesthetics that's a bargain!

Another bug in the “lugs are heavy” argument is that low-temperature brazing, particularly silver brazing, allows you to use thinner tube butts, because the lugs themselves serve as external butting. For instance, the tube ends (butts) on most TIG welded frame tubing are 1.0mm, and even the best TIG welder is reluctant to go below 0.8mm. A skilled silver brazer can easily handle 0.7mm or even 0.6mm butts.

RIVENDELL LUGS: HISTORY & TRIVIA

Rivendell lugs are designed to form strong, stress-free joints, to braze up quickly to protect the tube from excess heat, and to look as pretty as possible.

The origin of the road lugs is a story in itself. I used to work at Bridgestone, and I wanted the lugs on our '95 RB-1 to have elements of certain older style French lugs (Nervex and Prugnat). So I supplied Richard Sachs with blank lugs, which he then carved and filed by hand into such pretty shapes—the nicest I'd ever seen on any lugs. The lower head lug alone took him eight hours, and he didn't measure anything, or draw in lines to help guide the file, or use a template. He just sawed and filed away. Then Hank Folson, whom you may know as Henry James, translated Richard's work to paper, because the casters work from paper. (Note: These are not Henry James lugs.)

Waterford's Chris Fiorini and Marc Muller and I collaborated on the mountain and all-rounder lugs. Again, the starting point was a lug design I'd had in mind for Bridgestones. The idea was a pretty lug that removed all stress-risers from stressed areas, and displayed more curves and points where they wouldn't cause trouble, and would be easier to see, too. I tried Marc's and Chris's patience with changes, and I must publicly thank them for putting up with me. The breakthrough came halfway through the process, when I suggested the curl on the side. Mark liked it, but Chris didn't, and Chris has excellent taste, so I was confused. Then Marc and Chris put their heads together and submitted a design we all liked. As usual, my “talent” is finding the right people.

THE CROWNS

The road and all-rounder crown are both flat, because flat crowns are the oldest, most classic style, and I like flat crowns. I designed the road crown to match the lugs, and Richard Sachs suggested that the inside tangs be shaped to match some of the points on the lugs. The All-Rounder crown is similar but is wider, so it accepts fat tires. I was tempted to put a fancy R on the shoulders, but went with the lower key and more classical “epaulets,” as seen on many old French crowns, as well as military uniforms, notably that of Alexander I, the famed Muscovite. Fork crown epaulets serve no function, but are nice to look at.

The Rivendell mountain crown is less ornate, but it's not your basic TIG-welded unicrown. The fork blades are silver-brazed to a beautiful cast lug, which disambiguates stress better than a TIG weld. It's based on a design Waterford wanted to sell to S, after the separation, but it had the misfortune of being conceived at about the same time as suspension forks, so marketing forces snuffed it before it could ever be made. I saw the design, liked it, and added the shoulder window. No place for an epaulet!

I couldn't be happier with these designs. I had lots of help from Chris. Chris was a custom builder himself, and put in several years at the old Trek before hooking up with Schwinn's Paramount division. He's also a skilled freehand artist (he illustrates for the Rivendell Reader), and a whiz at Auto Cad. I always want his opinion.

WEIGHT, TUBE DIMENSIONS, DENT RESISTANCE, AND LONGEVITY

Rivendell frames are light, but not eye-poppingly so. Most of the tubes were drawn to my specifications, and the goal wasn't to compete with thin-walled aluminum, butted titanium, or the new paper thin supersteels. When you design with weight in mind, it's tempting to trim where you shouldn't. If you use good materials in the right places and proportions, the weight will be right. I wanted a reasonably light, well-designed frame that looks beautiful and is built to ride hard for many years without worrying about dents, fatigue, or buckled tubes, even if accidentally abused.

A 56cm Rivendell road frame weighs about four pounds and satisfies all those requirements. As a frame of reference, the

lightest aluminum and carbon fiber road frames weigh a bit under three, and a standard high quality steel road frame weighs between four and four and a half pounds.

Remember that during the past century steel frame tubing dimensions have been tested over millions of miles by hundreds of thousands of riders, and we've learned some things. I'm not ignoring technical advances, but it would be more foolish to ignore steel's history, to think you can just strip several ounces from a down tube without paying for later. My tube thicknesses generally fall between standard Reynolds 753 and Reynolds 531. Somebody, sometime is sure to sum up the frame as simply a “retro” statement, or think I've missed the mark because I'm not pushing the limits of lightness. But that was never the goal.

A tube's diameter to wall-thickness ratio bears watching. Over the years, traditional steel tubing hasn't exceeded 50:1 ($28.6/0.6=47.66$), but most of today's supersteels have higher yield strengths, and can exceed that a certain amount. Oversized tubes with thin walls are stiffer and stronger, but a smaller diameter tube with a thicker wall resists dents better. High wall-thickness-to-diameter ratios are particularly scary in aluminum; yet this is the “secret” behind some of today's featherweight aluminum frames.

The most highly stressed portion of a bike is the downtube, and the most abuse a frame can suffer is to run head on into an immovable object. So against today's trend, my downtubes have substantial, full-length butts. Downtubes are stressed in torsion (twisted) when you pedal hard, so I've kept the bellies thicker, so they twist less. (Waterford does this, too—and now is a good time to mention that I've relied heavily on Waterford's experience with all brands of frame materials. Marc still thinks I'm too conservative, and he may be right.) I'm not saying you can pile into a two-foot wall at 20mph and not expect any damage, but I suspect Rivendell frames will survive certain abuses that would destroy many other frames.

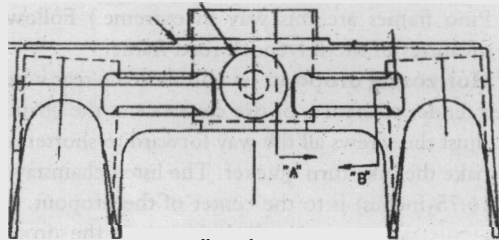
BUILDING WITH REYNOLDS 753

Most thin walled, heat-treated steels like 753 are more sensitive to heat than standard chrome-moly—even if the sales literature doesn't mention this. So Reynolds, ever careful, requires frame builders to braze up

continued on page 23

RIVENDELL ALL-ROUNDER

This frame is modeled after the Bridgestone XO-1, which itself was modeled after the French 650B-wheeled touring and the British “rough stuff” bikes. These practical breeds go back at least 50 years. I thought the XO-1 would revolutionize the concept of “hybrid” bikes, but instead it became a cult bike and a symbol for not fitting in. I don’t understand why this style frame is so hard to sell — it’s just a light road frame dimensioned to fit the widely available 26-inch mountain



all-mundrr crown

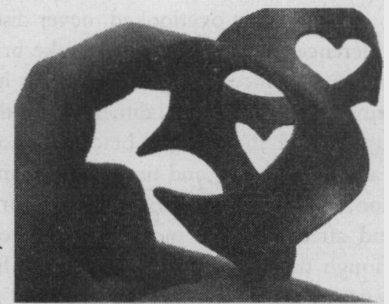
bike-sized wheels, and enough strength to handle anything short of the most abusive off-road riding.

The combination of road geometry and 26-inch mountain bike-sized wheels lets a lot of wonderful things happen. The 26-inch wheels are inherently stronger and lighter than 700C wheels, and allow you to fit a huge range of tires, from skinny ones to mountain bike size, with plenty of room left over for mudguards (with tires up to 26 x 1.5”). That’s a big deal, since tires and wheels make a bigger difference in the ride than any other component.

On smaller frames (low-50’s and smaller) the 26-inch wheels are especially important. A 700c tire with enough volume to cushion big bumps and carry loads—700 x 38c and up—is much larger in diameter than a road 700c tire, and you have to design the frame so that the tire doesn’t hit the downtube. You do this by any or all of

several compromises: lengthening the top tube too much, raising the bottom bracket too high, slackening the head tube angle too much, or adding too much fork rake. You have to design the frame around the huge wheel. Just by going to a 26-inch wheel, you get not only all the strength and weight advantages of the smaller wheel—and increase the tire selection—but you can design the bike to fit and ride correctly.

Although the All-Rounder is not a mountain bike in the usual sense, a rider with good skill and adequate judgment can ride it all over the mountains. (The World 24-hour Off Road Record is held on this frame’s predecessor, the



An upside-down A/R lower head lug. Bridgestone XO-1.)

Find the hearts...

The frame lets you build it up any number of practical ways, and seems made for whatever parts you put on it. With swept-back bars, fenders and racks, it’s a gentlemanly commuter: with Moustache H’bars and midsize knobbies, it’s uncatchable on fire

roads; with drops and Ritchey 1.1 Crossbites or Specialized Fat Boys, it’s the fastest commute bike in town. And how can you own one and not want to load it with baggage and take it on a tour? No matter

ALL-ROUNDER FRAME

| size C-T | seat angle | head angle | fork rake | top tube | chain stay | bb drop | over-locknut | TT/ST ø | DT ø |
|----------|------------|------------|-----------|----------|------------|---------|--------------|---------|------|
| 42 | 74 | 72 | 42.5 | 49.5 | 42.5 | 45 | 133 | 28.6 | 31.8 |
| 48 | 73.5 | 72 | 42.5 | 52.5 | 42.5 | 45 | 133 | 28.6 | 31.8 |
| 52.5 | 72.5 | 73 | 38 | 55.5 | 42.5 | 45 | 133 | 28.6 | 31.8 |
| 54 | 72.5 | 73 | 38 | 56.5 | 42.5 | 45 | 133 | 28.6 | 31.8 |
| 55.5 | 72.5 | 73 | 38 | 57.5 | 42.5 | 45 | 133 | 28.6 | 51.8 |
| 58 | 72 | 73 | 38 | 58.5 | 42.5 | 45 | 133 | 28.6 | 31.8 |
| 61 | 72 | 73 | 38 | 60.5 | 42.5 | 45 | 133 | 28.6 | 31.8 |

Notes: size your bike close to your road bike size; even closer if you use drop bars. The overlocknut spacing of 132 allows easy use of either road or mountainbike hubs. Dropouts are horizontal with double eyelets. Dimensions subject to change without notice.

how many bikes you own, this is the one you’ll ride most often, because it’s so fun to ride and so good at everything. I hope my enthusiasm doesn’t offend or turn you away, but I just think this frame can do it all.

a test kit which is then sent back to them for certification. But since 753 is so expensive, and must be brazed with silver (at \$7 per ounce, compared to brass, at \$6 per pound) most builders just use other brands. Some of the best builders in the world are not 753 certified, but having passed the certification test implies a certain degree of skill. Waterford Precision Cycles has five 753 certified builders, and it’s doubtful that anybody has more expertise with 753 tubing than they do. I think they are the best.



HEADBADGES



I’ll have two styles. For sure a cast pewter badge, similar to what you see here. “For sure,” because I have them in stock right now. The other one, ordered, is a cloisonne badge. I expect them to be ready by late June. Cloisonne you may not know by name, but you’ve seen it. Fired enamel, colorful and pretty. Fancy! Cloisonne, as a craft, is thousands of years old. In the next RR we’ll have a story about it.

RIVENDELL ROAD FRAME

Most of the changes in road frame design during the past 20 years have been subtle, but the cumulative effect of shorter chainstays, steeper angles, loss of eyelets, and vertical dropouts has made the modern road bike less versatile than a 1970's model. Still, it's no more raceworthy.

It's the easily overlooked, never discussed things that make the difference—the height of the brake bridge, the length of the fork and the distance from the brake bolt hole to the underside of the crown, and the internal dimension of the crown and the chainstays just behind the bottom bracket. Those determine the tires the frame **accepts**, and tires, more than any other single specification, determine what kind of roads or trails the bike is suited for and affect comfort more than any other component. **So** even though tire clearance ought to be a huge issue, in the design and purchase and selling of most road bikes, it rarely gets a mention.

Dropout eyelets are another thing. It used to be that even racing frames had them. But now, in order to save a fraction of an ounce and to present a “clean” frame, eyelets have been eliminated, **so** there's no convenient way to mount racks or mudguards. When you're out shopping for a road bike, you don't imagine yourself carrying loads or riding in the rain. But eyelets weigh **so** little and offer **so** much, it seems a shame to eliminate them altogether. Ten years from now your riding habits may change, you might be living in Seattle, you might want to shop by bike, or take a 3-day tour...

Don't get the impression that I want all road frames to be multipurpose workhorses. The point is, you can have the features that increase versatility without giving up any of the qualities that make a good racing bike feel **so** fine. The Rivendell frame has **all** the zip of a racing frame, but it is **so** much more versatile that it's like having another frame entirely. The most “radical” dimension on the Rivendell road frame is the chainstay length, from 42 to 43cm. Those are long chainstays by modern standards, but they're the same length as the chainstays on the bike Eddy Merckx won **so** many races on.

The Rivendell road frame is made from Reynolds 753 steel tubing drawn to Rivendell specifications. Those specifications are generally thicker than the standard Reynolds 753 tubing (which was designed as a superlight racing frame tubeset), and is built to ride hard in **all** conditions, and for a long time.

I designed it with a shallow seat tube angle to keep your weight back, which in turn reduces weight on your hands and strain on your shoulders. This puts you in a better position to absorb shocks, and allows a more powerful seated pedaling than you get with a more forward position. Since the shallow angle shifts your weight to the rear, I've compensated with a slightly shorter-than-normal front-center (the distance between the crank axle and the front hub axle), and used longer chainstays to shift the rear wheel slightly farther back. This combination—a slightly shorter front-center with

a longer rear-center—is the opposite of most modern frames, which tend to be short in the rear, long in the front. Those bikes feel funny to me, but that may be the curse of having paid too much attention on too many test rides over the years. In any case, the best riding bikes to me invariably tend to be shorter up front and longer in back. (Ritchey road frames have the same tendencies; and Pino frames are this way in extreme.) Following are some other features of the Rivendell road frame:

- **Horizontal dropouts** let you slide the rear wheel far back for added fender clearance, or tire clearance at the chainstays. Or you can adjust the screws **all** the way forward to shorten the wheel base and make the bike turn quicker. The listed chainstay length of 42.5 cm (16.75-inches) is to the center of the dropout. **You** can adjust it a little bit, since the dropouts are horizontal.

Vertical dropouts make the most sense on mountain bikes (for reasons explained on p. x), but the main reasons they've taken over on road bikes are index shifting's requirement that the hub axle-to-derailleur relationship be limited to a short range. This has even caused the extinction of those

nice, long horizontal dropouts that allow you to vary the wheel-base by almost an inch. An equally dubious reason for verticals on road bikes is that many chainstays have gotten **so** absurdly short that you can't slide the wheel forward to remove it, because it hits the back of the seat tube. A vertical lets it drop straight down.

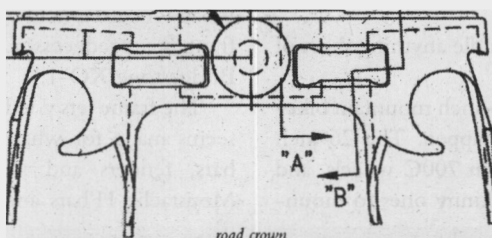
- **Clearance for 700 x 35 tires**, or 32s with fenders. Many modern road bikes are compromised off the race course because they don't have clearance for practical street tires.

Even if you don't plan to ride tires that large, the added clearance makes room for fenders, or gives the wheel some wobbling room if you happen to break a spoke, and that can make the difference between riding home and walking.

- **Dropout eyelets!** They make it easy to mount a rack or fenders. If you want to mount both, use a longer bolt in front (putting them both on the same bolt), and either do the same on the rear, or use a Blackburn Custom eyelet, made expressly for the purpose of fitting racks or fenders on eyeletless dropouts. They're cheap (less than \$5), light (11g per pair), and I stock them.

- **Low bottom bracket.** Conventional wisdom says a lower BB makes a bike handle better and easier to control at high speed, and I believe it. In BB heights, 10.25 inches is very low, and 10.75 inches is considered high. (By the way, the term “bottom bracket height” makes sense only on a bike with tires on it, since the height of the bottom bracket grows **and** shrinks as tires get fatter or skinnier. Still, some frame brochures specify bottom bracket height without a tire reference!)

Bottom bracket drop is the distance the center of the bottom bracket falls below the centerline of the front and rear dropouts. It is the first dimension I specify when I design a frame, and everything else keys off it. To determine the bottom bracket height you



measure the height of the hub (the wheel radius), and subtract the drop. In the case of a road bike with skinny 700C tires, the wheel radius is about 13.25 inches. On a typical road frame with a hanger drop of 2.5 inches, this yields a bottom bracket height of 10.75 inches. If you put a far more useful 28C tire on this bike, the BB height jumps to 11 inches—strong evidence that the

typical road frame is designed for hard skinnies. Remember, a Ritchey 700c x 28 with a kevlar bead weighs just 220g, and is faster than a skinnier tire on all but the smoothest roads.

The Rivendell road frame accepts a huge range of road tires, but I designed it with a 700c x 28 tire in mind. You can just as easily ride a skinny on it, but it makes more sense to wind up at 10.5 inches bb height with a nice 28c tire, than to be there with a racing


tire, and have it jump up too high with the tires you ride every day. With a racing tire your bb will be about 10.3 inches—definitely on the low side—but most everyone rides clipless pedals these days, and the cornering clearance gained by cliplessness allows you to ride a lower bottom bracket. If you're still riding toe clips (as I do), then you're probably not racing, and won't be bothered by a slight reduction in cornering clearance, since you don't have to lean the bike hard and pedal out of corners. • **128mm rear dropout spacing.** Until about 1975 almost every ten-speed was a true ten-speed, and the five rear cogs fit into dropouts spaced 120mm apart from the inner face of one to the inner face of the other. Then in the mid-to-late 1970s, the

birth and popularity of six-speed freewheels, which required 126mm spacing, made the old ten-speed obsolete. In time, six grew to seven which still fit into 126mm, and all was

wheel is laterally weaker, more flexible, and requires more care and attention throughout its life.

It's better to do without the problematic

12t eighth cog and stick with seven and a top of 13t. The 128mm spacing on a Rivendell frame takes seven-speed wheels with ease. If you do spread it to 130mm, it makes sense to use the additional space to

improve the wheel's symmetry and increase strength. You do this by keeping the spacing for 7-speed freewheels, just shifting everything over to the right. The chain angle problem is lessened by the longer chainstays, particularly if you pull the wheel all the way back into the dropouts. Of course, not all hubs allow this adjustment, but in any case, you can put any road wheel from the past 18 years through the present into a Rivendell frame. 

ROAD FRAME

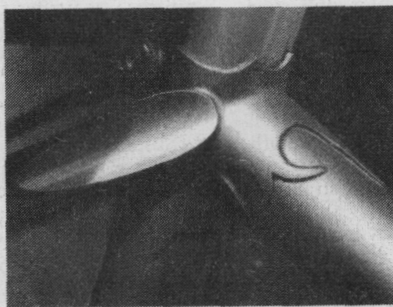
| size C-T | seat angle | head angle | fork rake | top tube | chain stay | bb drop | over-locknut | TT/ST ø | DT ø |
|----------|------------|------------|-----------|----------|------------|---------|--------------|---------|------|
| 50 | 74 | 72.5 | 45 | 50.5 | 41 | 45 | 128 | 28.6 | 28.6 |
| 52 | 73.5 | 73 | 47 | 53.5 | 42 | 75 | 128 | 28.6 | 28.6 |
| 54 | 73 | 73 | 47 | 55 | 42.5 | 75 | 128 | 28.6 | 28.6 |
| 56 | 72.5 | 73.5 | 45 | 57 | 42.5 | 75 | 128 | 28.6 | 28.6 |
| 57.5 | 72.5 | 73.5 | 45 | 58 | 42.5 | 75 | 128 | 28.6 | 28.6 |
| 59.5 | 72.5 | 73.5 | 45 | 59 | 43 | 75 | 128 | 28.6 | 28.6 |
| 62 | 72.5 | 73.5 | 45 | 60.5 | 43 | 75 | 128 | 28.6 | 31.8 |

Notes: the 50cm uses 26-inch wheels (mountainbike size) for uncompromised geometry as well as a wide choice of tire sizes. The 61cm road model uses the same lugs as the All-rounder, a 31.8 downtube, larger chainstays, and 27.4mm seatpost (all others use 27.2). Dropouts are horizontal with single eyelets. Dimensions subject to change without notice.

fine until the marketing forces spread the dropouts further apart to make room for yet another, eighth cog.

Combined with the shortening of chainstays, this trend has led to sharper chain angles between the front chain rings and rear cogs, which increases wear and worsens shifting. The irony of eight cogs in back is that, with the shorter chainstays and all, the chain angle is such that with most cranks and bottom brackets, you're effectively cross-chaining when you're on the small front ring and either of the two smallest rear cogs. So you don't have the full benefit of the extra cog. And, although you can get eight-speed clusters that have a top gear of 13t, stock bikes almost always have 12t top cogs matched with 53t big rings—a tall gear for mortals.

The biggest problem with eight-speed wheels is that they have virtually no dish on the right side. The spokes are nearly vertical, and this causes all kinds of wheel problems. Better spokes, rims and nipples have



mitigated the situation a little, but an eight-speed wheel must be built with wildly different spoke tensions on each side, so the



ABOUT TOE CLIP OVERLAP

On some Rivendell road frames, when your foot is at 3:00 and the wheel is turned enough, the tire will indeed touch your toe clip or shoe. Dangerous? It would be if you turned your bike by turning the front wheel, but you turn by leaning. If you turn the wheel that much when you're going faster than about 4 mph, you'll crash way before the toe hits. Adding a front fender decreases this clearance further (as will a bigger foot or tire), but it still isn't a problem at riding speeds. Occasionally having toe clip overlap is an inconvenience when starting off, or doing a track stand at a stop light, but that's a small price to pay for a better ride.

RIVENDELL MOUNTAIN FRAME

This is a light, strong, balanced, beautiful trail frame. It is not “suspension compatible,” which just means that the fork has not been designed long enough to be replaced with a suspension model of the same length, and you can’t buy it without a fork. No detail on it is patented or patentable, nobody gets paid to ride it, and by all standards by which modern, mainstream mountain bikes are judged, it is an anachronism. It is ideally suited to all kinds of off-road riding, though, and despite its light weight, it will stand up to the roughest use for many years.

I admit to being a little defensive about this frame. That’s because these days, when most people, me included, think “mountain bike,” they picture a modern high tech, race-oriented mountain bike with joints and pivots, springs and movement where the Rivendell frame has none. The danger, from my point of view, is that you’ll take one look at this bike and think the year is 1987 all over again. The fact is, a frame with a longer

wheelbase, slightly shallower head tube, more directional stability, and equipped with large, knobby balloon tires and the proper handlebar, is a wonderful bike for riding over bumps—even without springs and linkages and extra moving parts. I’ve **always** thought part of the fun of off-road riding was making the right judgments, and overcoming obstacles with a little help from a well-designed bike, but not too much help from too much technology.

This Rivendell frame geometry is a lot like the Bridgestones. The seat tubes are half a degree shallower because most riders shove the saddle as far back on the rails as they can, and laying the seat tube back half a degree lets you achieve the same riding position and still grab the seat rails closer to the center. This way, the saddle and the seat post will be stressed less if you land hard.

I like steepish head tubes on mountain bikes, because they allow a longer top tube (for a stretched out position) while limiting the bike’s front-center, the distance between the cranks and the front hub. That improves traction and handling.

Most mountain bike frames come with 1 1/8-inch steer tubes. Rivendells are the (now) old 1-inch size. One of the reasons many production bikes come with 1 1/8-inch is that, until 1994, the majority of foreign-made mountain bikes had high-tensile head tubes (even expensive frames). High tensile steel has a much lower yield strength than CrMo, so the head tubes became ovalized more often. This problem was, and still is exacerbated by a subtle change in head set design, in which the insertion sleeves on head cups has shrunk, over the years, from the old standard of 9.5mm to as little as 5mm. The shorter sleeve doesn’t distribute stress as well, and so—the problem. Rivendells have Reynolds head tubes which are stronger to begin with, and are further reinforced by a 1.2mm thick CrMo lug. The headsets I use (Stronglight) have a full 9mm of insertion, and the combination of this

head tube and lug is sturdy and reliable.

The frame is just one of many things which affects how comfortable the ride is, and it still doesn’t make as much difference as the wheels and the rider. Still, a frame that is light and not overly rigid seems more comfortable to ride than a heavier, stiffer frame. Maybe it’s because light bikes are more maneuverable. I think a light front end is particularly important, because it lets you lift up over bumps and make last-second maneuvers faster than you can with a heavy front end. I suspect that suspension fork riders hit more bumps and hit them, harder because they can’t maneuver as well, and can’t lighten the load up front as easily. They just go stubbing along, convinced they’d be suffering if they had regular forks.

The Rivendell mountain frame/bike is perfect for a riding style

which acknowledges that certain rocks are to be avoided, and that part of the reward of off-road riding is learning skills to overcome technical challenges at your own private

speed. In the common sense of the word, it is not a racing mountain bike; but that’s not a bad thing, and you can still go fast on it.

The Rivendell mountain frame is built with mature technology, proven materials, and the best craftsmanship, and nothing has been spared to make it the best of its kind.

Historically, competition has been used as a testing ground for technology that eventually trickled down to the lowly rest of us. But most of today’s modern high-tech race bikes have gone beyond a natural evolution based on the riding needs of the many, and have mutated into complex machines that meet the racing and psychological needs of a few. But bikes don’t have to be complicated to be good, and as Joseph Priestley (who was not a bike rider) said, “We cannot get grace from gadgets.”

I don’t like the terms “hard tail” for normal, unsuspended rear triangles, and “rigid” for normal, not-suspension forks. Those terms are convenient, but misleading because they lump all non-suspension bikes and forks together. The Rivendell fork, like many other fine off-road forks (including the Ritchey Logic, and the recent Bridgestone) is not rigid. It resists twisting enough to provide good direction, but it still absorbs shock because it flexes (without bumpers or hydraulics or independent blade movement.) The amount of shock absorption in the blades is miniscule compared to what the fat tires provide, but that’s the case with any fork.

Suspension forks unquestionably absorb more shock than the Rivendell fork, but they also weigh more, cost more, require upkeep, and make your bike’s front end less agile. There have been studies that “prove” you use less energy riding a suspension bike, even if it weighs a little more, than you do on a normal bike, but bicycles are already the most energy-efficient form of transport ever devised, and unless you’re a world class racer with next year’s contract at stake, it’s ridiculous to rate equipment based on the small differences in energy expenditure between different sub-25lb bikes.

MOUNTAIN FRAME

| size C-T | seat angle | head angle | fork rake | top tube | chain stay | bb drop | over-locknut | TT/ST ϕ | DT ϕ |
|----------|------------|------------|-----------|----------|------------|---------|--------------|--------------|-----------|
| 16 | 73 | 72 | 40 | 55.5 | 42.5 | 40 | 132 | 28.6 | 31.8 |
| 17.5 | 73 | 72 | 40 | 57 | 42.5 | 40 | 132 | 28.6 | 31.8 |
| 19 | 72.5 | 72 | 40 | 58.7 | 42.5 | 40 | 132 | 28.6 | 31.8 |
| 20.5 | 72.5 | 72 | 40 | 59.7 | 42.5 | 40 | 132 | 28.6 | 31.8 |

Notes: frame sizes are in inches. To find the metric equivalent multiply by 2.54. The 132 overlocknut spacing allows use of either older style 130mm hubs or newer 135mm ones. Dropouts are vertical with double eyelets. Dimensions subject to change without notice.

BAGGAGE!

Most people I know have a thing for luggage. How can you not? I like strong, simple bags, and I hate flimsy ones.

As a bike rider/thing carrier you have many choices. Fanny packs work well for small loads, but are awkward off the bike. Musettes are good for small loads, provided they have a waist strap or some other anti-swing device. Courier bags are good for big loads and unpredictable shapes. Front panniers carry weight well, but you need the eyelets and a rack; and then they'd better be secure, because they're so close to the front wheel, and you don't want them detaching and getting in the spokes. Rear panniers are less risky than fronts, but the Pannier-Loading Police get all mad if you carry the bulk of your weight in big rear bags. Those guys. And with all panniers, what do you do with the load if you have to park your bike and take your stuff out? Saddlebags are an English thing. I like them, but they are incompatible with most saddles. Clearly, no one bag is perfect for everything, a fact for which those of us with bag obsessions are grateful.

Material. Most soft luggage and packs are made from nylon—either 6-7oz "pack cloth" or 11.5oz Cordura. Nylon has been sold on its tear strength and abrasion resistance—sort of trickery, since when nylon packs self-destruct, they do so at the seams. Walk around a college

campus or go down to the strip mall and you'll see a fraying daypack before you can say "Will Robinson."

Another problem with nylon is that it is damaged by ultraviolet rays, more so than any other fabric. It gets weak, brittle, turns to junk. Rock climbers see 4,000 lb test nylon webbing, after prolonged exposure, weakened to the point where it breaks with a strong pull by hands alone; and at high altitude, continuous sun can ruin a lightweight nylon tent in sixty days. Finely woven cotton frays a short distance, then stops as the myriad interlocking microfibers grab on and hold; and cotton withstands UV with little damage. Imagine cordura cut-offs after a couple of washings. You'd have an illegal hula skirt.

Zippers are another weak point, especially if they're nylon coils. A nylon coil zipper moves smoothly around corners, but is wearing out from the first time you move it. Since coils are more difficult to replace than sliders, the zippermakers make sure the abrasion from the nylon zipper wears out the slider first. When that happens, the coils don't interlock enough to hold, and once it starts to happen, it just gets worse. For light use, coil zippers are fine, and for the amount of usage most panniers are subject too, they do well. For hard or continuous use, or whenever security is more precious than one-click accessibility, please choose a prong buckle.

CARRADICE CYCLE BAGS, FROM ENGLAND.

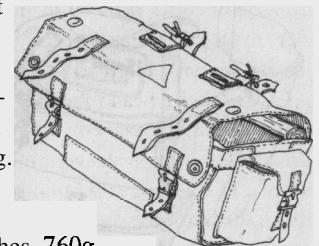
CARRADICE BAGS ARE MADE IN ENGLAND WITH DESIGNS, FABRICS, AND METHODS THAT HAVE CHANGED LITTLE OVER 50 YEARS. THE FABRIC IS HEAVY, WAXED COTTON DUCK, THE STRAPS ARE THICK LEATHER, AND THE BUCKLES ARE ZINC-PLATED STEEL. THE FIRST ONES I BROUGHT IN HAD BRASS BUCKLES, A COOL IDEA THAT BACKFIRED WHEN, AS IT TURNED OUT, THE BUCKLE DIMENSIONS WERE DIFFERENT FROM THE ORIGINAL ZINC-ERS, AND SOME OF THE STRAPS WERE SO TIGHT THEY WERE UNUSABLE. SO BACK TO THE TRIED & TRUE ORIGINALS. ANYWAY, THESE ARE EXCEPTIONAL BAGS THAT SHOULD LAST YOU THE REST OF YOUR CYCLING LIFE.

2 MODELS OF SADDLEBAG,

Saddlebags are a purely English cycling affectation, and in the thirties and forties virtually every saddle in England wore one. These are the traditional "transverse" style, which means they stick out the sides. They require some method of attachment to the saddle, such as the handy loops that are built into some Brooks models (molded loops are not trustworthy for large loads). A third, lower strap buckles around the seat post. Saddlebags are my favorite way to carry medium sized loads, and these Carradice models are the best I've seen. I use one every day and can't imagine getting by without it. (We are working on a mini-saddlebag, made in California. It'll be about 4 x 5 x 9 or so, and the Carradice influence will be obvious. Interested? Let us know.)

NELSON LONGFLAP: Carries up to 2 gallons of milk, tubes & tools, spare clothes, heads-0'-cabbage, boxes of cereal, boomerangs, galoshes, just about anything you throw its way. In seven years I've never had a load I couldn't somehow fit into mine. Lash straps on the flap accommodate a small bedroll or extra clothing, making this a fine bag for summer overnights, three-day hostel tours, or family day trips where you have to carry everything. A good bag for the rackless. Requires at least 13 inches between the top of the tire and the saddle loops. One main pouch, two outside pockets. 14" x 11" x 8". 1,098 cubic inches. 760g.

PRICE: \$59

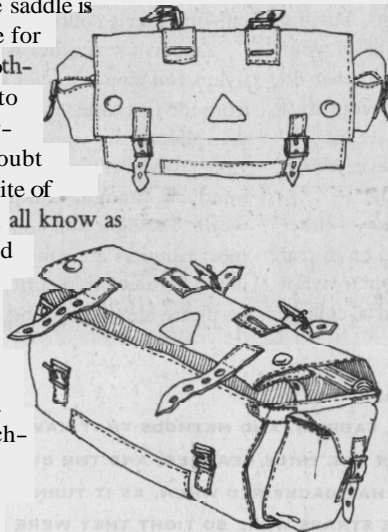


PHONE: (510) 933-7304 FAX: (510) 933-7305

IF YOU ARE ACCUSTOMED TO PACKS AND LUGGAGE MADE WITH SCIENTIFIC OUTDOOR FABRICS AND PLASTIC ONE-HAND QUICK RELEASE BUCKLES, AND MESH OUTER BAGS FOR DRYING YOUR DANK HOSIERY, THE LOOK OF A SPANKING NEW CARRADICE BAG WILL JOLT YOU. THE FABRIC IS REAL BLACK, STIFF AND STARCHY, AND THE STIFF-AS-WOOD LEATHER IS A QUEER PALE GREY. YOU DON'T WARM UP TO IT INSTANTLY, AS YOU MIGHT IF IT WERE OLIVE, BROWN, AND ANTIQUED BRASS. EVENTUALLY THE FABRIC FADES AND THE LEATHER SOFTENS TO THE POINT WHERE THE PRONG FINDS THE HOLE WITHOUT A FIGHT, BUT THIS WILL TAKE A FEW MONTHS OF STEADY USE—A SHORT BREAK-IN PERIOD CONSIDERING THE MANY YEARS OF SERVICE THAT WILL FOLLOW. OR YOU CAN SPEED THE PROCESS BY TREATING THE LEATHER WITH SOME SORT OF EMOLIENT, SUCH AS LETHR-EMO.

LOWSADDLE LONGFLAP: A hobbit-sized version of the Nelson Longflap, designed for frames in which the saddle is closer to the rear tire (though it works fine for any sized bike). Carries spare shoes and clothing, lunch and tools, or enough bannocks to satisfy the hungriest throng. Recent discoveries have proven beyond a shadow of a doubt that the Lowsaddle Longflap was the favorite of Henry Wadsworth Longfellow, whom you all know as the author of the epic poems *Evangeline* and *The Song of Hiawatha*. One main pouch, two outside pockets, and handy D-rings on the outside of the flap (not shown). I've often lashed several large boxes to these D-rings, then rode away like a hobo. 14" x 9.5" x 7.5". Capacity: 854 cubic inches. 680g.

PRICE: \$59



WHAT DO YOU DO IF YOUR SADDLE'S GOT NO LOOPS?

FANTASTIC QUESTION! OVER THE YEARS THERE HAVE BEEN MANY DEVICES WHICH ALLOW YOU TO USE CARRADICE BAGS ON SADDLES WITHOUT BUILT-IN LOOPS. SOME STILL EXIST, BUT I'VE NEVER USED ONE THAT WORKED GREAT, ESPECIALLY ON MODERN NONBROOKS SADDLES, WITH THEIR SHORTENED RAILS. BUT CARRADICE HAS A DEVICE THAT SHOWS PROMISE, AND BY THE TIME YOU READ THIS I'LL HAVE A SAMPLE. IT SHOULD COST ABOUT \$24—A LOT FOR A LITTLE THING, BUT IF IT ALLOWS YOU TO CARRY A 'DICE, WELL WORTH IT. ALSO, A COUPLE FRIENDS ARE WORKING ON NEW VERSIONS, AND I'LL MAKE THEM AVAILABLE WHEN THEY'RE FINISHED, PLEASE LET ME KNOW IF YOU'RE INTERESTED, AND I'LL SEND NOTICE WHEN THEY ARRIVE.—GRANT

SUPER C FRONT AND REAR PANNIERS

These are simple sacks unencumbered by compartments which create unfillable corners. (If you like to compartmentalize your load, do it with stuff sacks.) The top loading style guarantees security and overstuffability; you can always fit one more thing in, because you don't have to close a zipper around it! Sturdy and simple, always up to the task, they're just wonderful.

Let me say something about mounting systems, and this one in particular. There are a couple popular methods. One uses springs or elastics; another uses stretchless tension. (We're talking about how the bags stay on the racks.) Springs and bungies are fine for smooth roads, but on rough roads you need flexless, stretchless tension. Carradice bags come with this style retention, and it is very good. The thing is, it is excellent. But for maximum security when you fall into the paintshaker, we include our own Rivendell Remarkable Retention System. It takes a little longer to mount the bags, maybe 50 seconds (no rushing), but once you set it up, a paintshaker couldn't make the bags come off. Trail tested by Spencer and I on the bounciest cow trail in California. Instructions included.

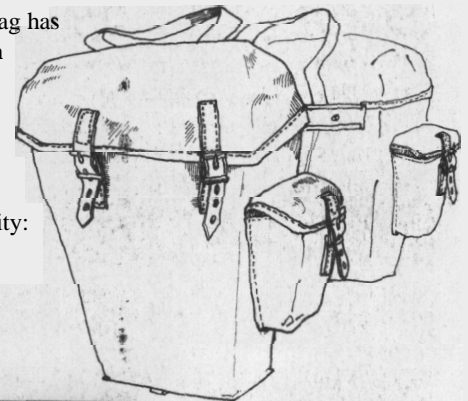
FRONT (works on the rear as well) 11" x 11" - 6" x 4" - 5". Each bag has one main pouch and a side pocket. Straps are longer than shown here. Capacity: 1,464 cubic inches. 1,304g. That's per pair.

PRICE: \$80/PAIR

REAR. Each bag has one main pouch and an outside pocket.

5" x 12" - 8" x 7" - 6". Straps longer than shown. Capacity: 2,563 cubic inches. 1,528g. Per pair.

PRICE: \$105/PAIR

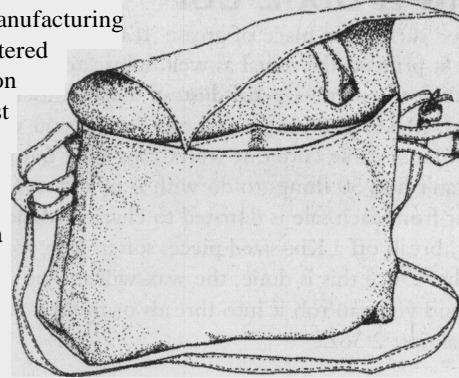


ACME MUSETTE

I used to think Acme was an acronym for American Commerical Manufacturing Enterprises, or something close to that, and I wondered if it was a registered trade mark. But on a lark I looked it up and there, in my Second Edition American Heritage dictionary, "acme" is defined as "the point of utmost attainment" — hence the name change.

Two pockets inside carry your wallet, beeswax, postcards, pens, pencils, and erasers the main pouch is big enough for files, maps, newspapers, magazines, and 3 medium bananas. Pal Jeff has used his as a handlebar bag, but he's that way. It has the same waist-strap as the simple musette. The latest fabric is a heavy waxed cotton made exclusively for my favorite outdoor clothing company up there in the Northwest, beginning with F. I may run out, but you can always count on various shades of natural cotton, olives, tans, or khakis. There's a sewn loop on the flap. I don't know exactly what to do with it, but it's there if you need it. In the meantime, for a somewhat secure closure, just run the waist strap as a belt between the two side loops, and tuck the flap under it. Approximately 11.5" x 10" x 1.75". 240g.

PRICE: \$12



PLAIN MUSETTE

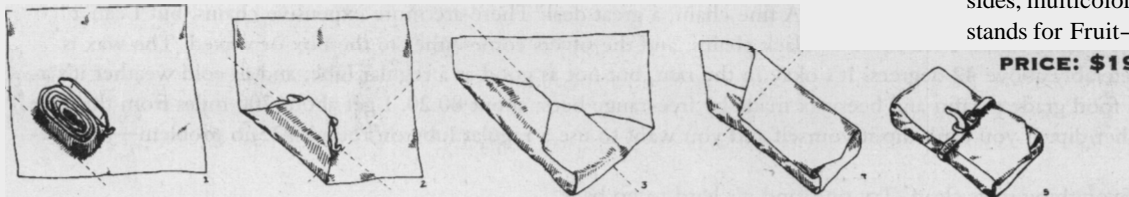
Lets you ride with a T-shirt on a hot summer day, and still carry all you need. The standard method of wearing is to sling it over your shoulder like a bandolero, but you can wear it as a fanny pack, too. Light, stuffable, always handy and good to have along in case you find something bulky to take home. Made of strong, light canvas, reinforced at the stress points. Two loops on the side allow you to cut the spare strap (provided) in half, then tie them to the side loops, then in front of your stomach, for swing-free riding. Ties on the mouth are for oversized load retention. 85g.

PRICE: \$7

TOOL & TUBE TOTE

When all you need to carry is a spare tube and light toolage, you can't beat this roughly 16" x 16" cut of stout, finely woven unhemmed waxed cotton. Put your gear in one corner, roll it up until covered, then fold over the ends and finish rolling. (See the pictures.) Secure the wad with a stout rubberband, then strap it to your seat rails or seat stays with a toe strap; leather if you've got it (the buckle bites better). Always put one in a Carradice pocket. When you get a flat, just lay it out like a placemat, and your small stuff won't get lost in the dirt and leaves. You can't do that with a wedge pack, now, can you? Assorted, always stout fabric in some earthy tone, depending on availability. 16" x 16" (or so). Light. Get one! The sequence below shows one of many ways to fold it.

PRICE: \$2



RIVENDELL T SHIRT

Unbleached cotton, very soft, with little flecks, and screened with a 3 1/2" multicolored Rivendell circle logo on the front, and a big RIVENDELL and some kind of inscription across the back.

M, L, XL, XXL

PRICE: \$12

RIVENDELL MOCK-T LONGSLEEVE

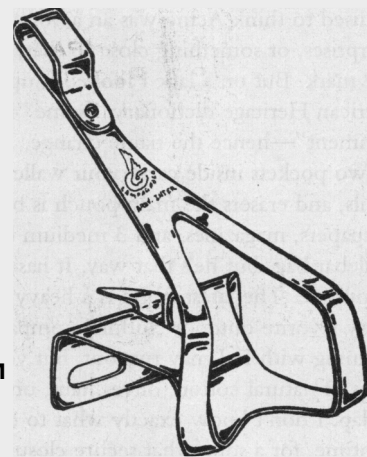
Same FOL unbleached tusk-coloured all cotton fabrique as le T. I had planned to order these in organique coton, but the source was flaky and finally said "well, you know.....we shan't have mock T's until September." Anyway, these are a lot like the T's, but with a different slogan in back. Makes a fine pajama top. I usually wear one all day, sleep in it, and wear it most of the next day, too. Printed both sides, multicolor logo looks nice. (FOL stands for Fruit-of-the-Loom.)

PRICE: \$19

BEESWAX IN A DIXIE CUP

Use for all threaded surfaces in place of grease. It's better than grease in many places, because it protects the metal as well, lubricates, yet also prevents vibration from loosening the part—a pedal dustcap, headset lockring, chainring bolt, or whatever. Makes good cable end caps, and if you wax a cable before cutting it with lousy cable cutter, it won't fray. Plug frame vent holes, get creative. If you can't find 50 things to do with it in and out of doors you aren't trying. A dollar from each sale is donated to charity. Made by free-range bees. To use it, break off a Kix-sized piece, soften it in your hands, and knead it till it's squishy. Once this is done, the wax will rub on anything without crumbling, and you can rub it into threads or mold it to any shape needed. About 70g, almost 2.5oz.

PRICE: \$3



CAMPY ALUMINUM TOE CLIPS

These are the neat ones with the funny cleat-guide. Very pretty, only 29g in a medium (fits to 43), and they won't break unless you abuse them. S (fits to 39), M (fits to 43), L (fits bigger). I have a few small steels, too—maybe nine.

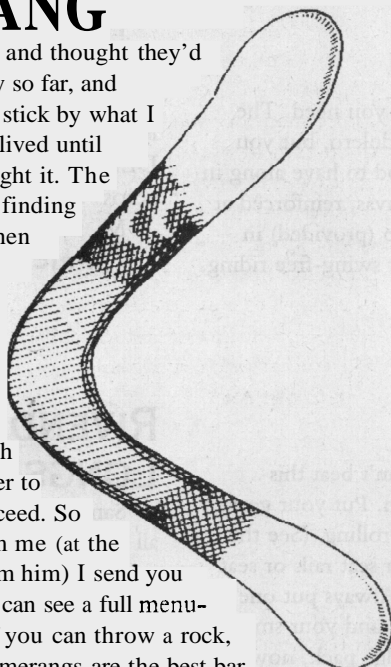
PRICE: \$15

BOOMERANG

I bought thirty early on and thought they'd last a year, but I've sold fifty so far, and nobody has returned one. I stick by what I said in RR-1: You haven't lived until you've thrown one and caught it. The trouble with boomerangs if finding where to find them at all, then making sure they're good ones.

I've been buying from Rich Harrison, the Boomerang Man from Louisiana. I like Rich, and I'm not out to compete with him—he's devoted his career to booms, and deserves to succeed. So when you buy a boom from me (at the same price you'd buy it from him) I send you his brochure, and then you can see a full menu-o'-rangs to choose from. If you can throw a rock, you can throw a 'rang. Boomerangs are the best bargain in toys today. Can you imagine regretting this purchase?

PRICE: \$18



SACHS CHAINS

The SC-40 model, roughly equivalent to the Sedisport. A fine chain, a great deal. There are more expensive chains, but I can't bring myself to spend \$25 for a dang chain. I sell silver or black chains, and the silvers come either in the box or waxed. The wax is great for dryish weather, preferably above 42 degrees. It's okay in the rain, but not as good as a regular lube; and in cold weather it's a bit stiff. I use a mix of non food grade parafin and beeswax made by free-range bees; about 80:20. I get about 700 miles from this mix before the chain needs another dip. If you can't dip it yourself and you want to use a regular lube on round #2, no problem—just pretend the wax isn't there.

Waxed chains are nice. Everything stays clean. Try one, and it's hard to go back.

PRICE: BLACK, BULK PACKED, UNWAXED: \$11

SILVER, IN THE BOX: \$13, SILVER, WAXED: \$15

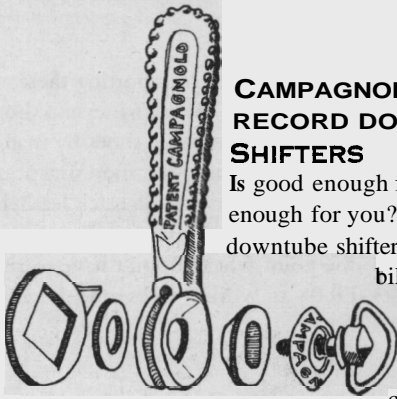
CHRISTOPHE STEEL TOE CLIPS

In the old days these were the cheapies that poor people rode, which is how I came to like them so much. Now they're on the list of endangered bike parts that have served generations proudly but don't have enough sizzle to cut it in the '90s. I wish I had a thousand pair, but I have just about 50, only medium (but if you need a S or L, ask privately).

PRICE: \$10. (tip: ask around at bike shops and you can probably find them for a dollar; but I bought these for more than that, and can't match blow-out prices)

GPM STEEL

Large only. I bought sight-unseen and was very disappointed. Pal Jeff says he likes them, but I sure don't. I'm selling at cost and encourage all who read this and who can fit a large to flip a coin five times now. If you get four heads, buy a pair, okay?



CAMPAGNOLO NUOVO RECORD DOWNTUBE SHIFTERS

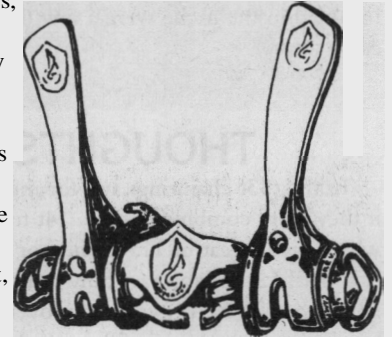
Is good enough for Eddy Merckx good enough for you? These are the classic downtube shifter that ~~w~~outlast any bike they go on. They have an annoying habit of loosening, but some beeswax in the boss cavity alleviates 80% of that problem. Anyway, the wingnut on the side makes them easy to snug during a ride. The lightest, best-looking and longest lasting shifters of any kind ever made. When they're gone, that's it, no more, don't squawk. Fits braze-ons only. 39g/pr. **PRICE: \$19**

CAMPY DOWNTUBE SHIFTER COVERS

Black, blue, dark blue, yellow, white, grey, green, red, and the rare, elusive slate. Made for Nuovo Record, fits fine on the fancy C-Records. Gets rid of the shine. Unpackaged, dusty, but the real thing. State first, second, and third choices, because I don't have a lot of any. **PRICE: \$5/PAIR**

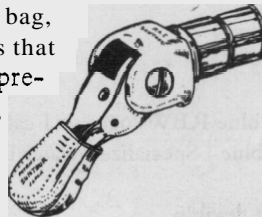
CAMPAGNOLO C-RECORD RETROFRICTION DOWNTUBE SHIFTERS

Campy's answer to the Rushmore-bound Simplex retrofriction shifters, and arguably even better. Larger drum pulls more cable than the Simplex, but who are we to kick a good brand gone extinct? I still prefer the Simplexes because they were the first, I liked the look, and the broad, flat cutout lever feels nice against me thumb. But even *so*, these work at least as well, and if you can stand the shininess, you'll love them. Only one thing: They have a tendency to squeak unless you lubricate the **two** shiny concave washers. You have to do this only once, and it's a cinch. Loosen the wingnut, remove the cap, and the washers are just inside it. Take them out, grease them up, and put them back in in the same concave side-inwards orientation the factory recommends. Clamp-on version, but the shifters pop off easily for use with braze-ons. That leaves you with a set of clamp-on bosses for that brazeon-less frame you always wanted to convert to a cyclocross bike. Then **all** you need are the adapt—oh, forget it. Get the shifters, you'll never regret it. 94g with clamp; 69g without. **PRICE: \$41**



SUNTOUR POWER-RATCHET BAR-ENDER SHIFTER

Like the original Nike Lava Domes, the Pentax K-1000 camera, the Sierra Designs 3-Person Tent, the Trailwise Slimline sleeping bag, and the Stanley Powerlock Tape, there are some things that deserve to exist forever. These SunTour shifters are as predictable, durable, reliable, and functional as shifters get, and they haven't been made for almost a decade now. I bought 124 or so pair from a couple distributors in Canada, and most of them came without cables, housing, or instructions. A fiend had the original SunTour instructions, so I photocopied them. I used to sell them without cables and housing, and still will, if you insist, for the same \$25. But I decided, this time around, to get some housing and cables so you don't have to. The housing has caps and everything.



Price with the fixings: **\$32.**

RIVENDELL BAR-END SHIFTER UPDATE

THE TOOLING COSTS ARE SO HIGH—FROM \$9,500 TO \$14,000—AND I'M RELUCTANT TO GO TO TAIWAN FOR THIS PIECE, EVEN THOUGH THE TOOLING WOULD COST ABOUT \$4,000 THERE, AND WOULD BE AS GOOD. I JUST REALLY WANT TO MAKE THESE HERE. THE DESIGN IS COMPLETE, AND BY JULY 5 I SHOULD BE RIDING THE PROTOTYPE. IT'S JUST A MATTER OF FINDING THE RIGHT PEOPLE TO MAKE IT. REMEMBER--THIS IS A NON-INDEXED, RETROFRICTION (SIMPLEX STYLE) BAR-END SHIFTER. IF YOU HAVE ANY SUGGESTIONS AS TO WHO CAN DIE-CAST IT, LET US KNOW.—GP

FLASH! COFS

I've just come upon a pile of cool old French stuff, too much to list here, besides which I haven't even gone through it all. If you need old TA rings in any size, especially the rare and beautiful 33t, or Italian-threaded TA cups, or Whitworth TA, assorted spindles including the triangular jobs, or Mafac small parts, or Super Champ #58 rims in 32H or 40H, brake cable hangers, the smooth and silent Mafac brake shoes, or Bluemels fender flaps, I may have it. More details next issue, but if you can't wait, call 510 933-7304 or fax 510 933-7305 with a specific request. Also included in the cache were a few (hundred?) Campy chainstay cable stops.

CARNAC SHOE UPDATE

I've got my hands so full—I can't deal with importing these shoes right now. It's mostly a money thing—it'll cost several thousand to bring in a decent amount, and then selling shoes by mail promises a lot of returns. Nevertheless, I know the shoe situation is mighty bleak and I think there ought to be an all-black leather non-SPD compatible touring shoe option, so give me time to build up the bank account to the point where I don't have to risk 25% of my balance on shoes. I'll try to work it in by mid-June. Refer to RR-1 for details.

THOUGHTS ON CHAINRINGS.. .

I think 53t chainrings are, for most riders, a bad thing. Too big! It would be one thing if they were combined with a 14t top rear cog, but it's never that; it's always a 13t, which give a gear of 113-inches, or a 12t, which makes an 119-incher—and who can ride that? Unless you race, any gear over 100-inches is NOT all that useful. If you have a 53t with a 12-13-14, you're up over 100-inches in your three highest gears! A smaller big ring is way more useful.

I just bought four hundred Shimano Dura-Ace and 600 48t and 49t chainrings. A 49 x 13 is a 101.7-inch gear, and a 48 x 13 is 99 inches—plenty big, don't you think? It also means you can stay in the big ring a little longer when you're on the other rear cogs.

My own sub-50 breakthrough came when I was trying out lots of different cranks and bottom brackets on the Rivendell prototype. I put on a 46x36x26 triple, later took off the 26t because the bottom bracket I wanted to try couldn't handle the third ring, and that left me with a 46x36 double. I went on my normal rides, solo and with Peter-the-Mongoose rep and pal Jeff, and I didn't even think about the 46t ring until one of them brought it up, several rides later. "Oh yeah, I guess I should be on a 52," I said, or something like that. But I haven't changed it since, and the more I ride it the more I'm convinced that what I really want is a 48t or 49t ring. On a now-standard 130 bolt circle diameter you can go down to 38t or 39t, depending on the ring, *so* you can still have a nice 10-to-11 tooth difference.

Also, if you have a 130bcd road crank and you want even lower gears, **you** can get a middle ring onto which you can bolt a granny gear. This other set of holes accommodates a standard 74mm bcd ring, and the next thing you know, you're packing up the Carradice and traipsing off to who knows where?

RBW H2O BOTTLE

These are made by Specialized, screened with a blue RBW logo, **so** I can sell them cheap. (The one-color makes them cheap, not the blue.) Specialized water bottles are the best.

White or Clear. State a preference, but please be flexible.

PRICE: \$4 EACH. One dollar from **each sale goes to charity.**

DURA-ACE & SHIMANO 600 CHAINRINGS, CHEAP

The Dura-Ace rings are new-old stock from 1981 (EX series, with the W-cut) and if they were 53s, could sell for \$50 in Some Store. I bought them for \$2.00 each, and am selling them to you for \$12 each, a bargain for both of us. The 600s, which turned into Ultegra, cost me the same, you \$3 less. The phenomenal profits go directly into the RTF (Rivendell Tooling Fund), which badly needs a boost if that stem and those shifters are ever going to happen. With each chainring you get a BOB coin purse AND a gift certificate worth \$5 on your next order of \$20 or more. Do I want to sell these rings? Am I nervous about having bought **so** many? Do I really believe that this smaller size makes more sense? All three questions get the same answer!

PRICE: \$12 for Dura-Ace;
\$9 for Shimano 600.

DATABOOK UPDATE:

I no longer have any, but Chuck Schmidt does. Call (213) 256-0815.

THE REAR DERAILLEUR IS AS COMPLICATED A MECHANISM AS I CAN UNDERSTAND. Over the years there have been so many brands from so many countries, and such a variety of designs, but they all have a parallelogram that pivots inward and outward. You pull the cable and it moves in, against a spring; you relax the cable and the spring moves it out.

How the parallelogram is designed determines how it moves. The traditional style is a drop parallelogram, which appears vertical (think of old Campy N.Record style). In a drop parallelogram design, the upper pulley (jockey pulley) maintains a constant height as it moves in and out.

The modern style is the slant parallelogram, developed by SunTour in the early seventies, I think. In a slant parallelogram

style, as the parallelogram moves inwards, it moves downwards as well. The advantage to this—and let me say that in my experience this advantage has always been overplayed—is that the jockey pulley can be set closer to the small cog initially, and follows the line of the cogs more closely, as it moves in and out. When the jockey pulley is close to the cog, shifting tends to be faster, but as I've said, I can't tell a difference. The main thing about slant paras is that they are a requirement for indexing. The irony here is that SunTour, which came up with the idea (no doubt inspired by the old Huret Allvit from France, but that's another story) is no longer with us. Shimano adopted the SunTour design, and the rest is history. I think all currently manufactured derailleurs are slant paras.

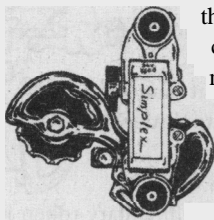
Two of the Simplexes I carry, the 6600s, look like slants at first, but when you look

closer (as I didn't do until member Jeremy Bunn pointed it out to me), they move like drops. The parallelogram is horizontal, so the pulleys move straight in and out, just like a drop. I'm getting a little out of my small area of expertise here, but I think the advantage to this horizontal para design is that the chain wraps around more of the cogs, and so wear is reduced. If anybody knows differently, step forward.

It used to be that you could tell the country a rear derailleur was from by its shape, and you could name brands from twenty yards. Designers cared as much about how the derailleur looked as how it works. Modern derailleurs all look alike—variants of the early '70s SunTours, spiffed up with a '90s lustre. What a shame! These older styles shift wonderfully and make a bike special. Put them to use!

THESE ARE FRICTION DERAILLEURS.

SIMPLEX #5500 REAR DERAILLEUR



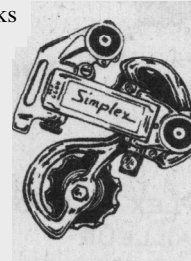
The classic drop-parallelogram style, and one of the most sought after derailleurs in the world; just not in this country. Non-indexing, so naturally the mainstream has no use for it. Shifts great, of course—what would you expect from a French company with more than 50 years of derailleur-making experience? Comes with Bullseye pulleys, classic red or tasteful silver, no choice, installed free of charge on request; otherwise you do it, and it's easy. 26T capacity, 180g.

PRICE: \$85

SIMPLEX #6600 REAR DERAILLEUR (SHORT CAGE)

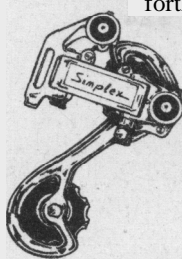
A non-classic horizontal-parallelogram style, a curious design by French standards, in that it looks Japenesey. Not a big seller here at Rivendell, but listen, this is a fine derailleur that looks good on a bike, and weighs only 199g. If you don't need anything larger than 24t in back, and you don't have to index, and you can afford \$75 but not \$85, this is the one to get. Same Bullseye pulley arrangement as the #5500. 24T capacity, 199g.

PRICE: \$75



SIMPLEX #6600GT REAR DERAILLEUR (LONG CAGE)

Remember the old days when GT meant "grand turismo"? Anyway, this is my latest favorite everyday derailleur. I put it on a bike to test capacity and shifting and so



forth, and halfway expected it to be sluggish—carryover from when the scuttlebutt said long cages shifted slower. No way. This shifts as fast as any derailleur, and I like the long cage. I use it with a Logic triple, still have a low Q-Factor, and when I veer off the road and find some really steep trail, I just plop it into gear and go. Beautiful and light. Same Bullseye pulley arrangement as the others. 32T capacity, 210g.

PRICE: \$80

PHONE: (510) 933-7304 FAX: (510) 933-7305

I've never used a front derailleur that didn't work well, provided it was set up right and used appropriately—short cages for racing gearing, and so on. A front derailleur's task is so simple it's hard to make a bad one. The trouble with front derailleurs is their operators. When I wait too long to downshift, I deservedly fail—I don't pine for cheater chainrings and contorted cages that lift and separate.

Only four things matter to me in a front derailleur: (1) Fit. It's got to fit between the chainwheel and the crankarm of any crank I might want to use. (2) Weight. If it's more than 128g, I'd just as soon use my finger.

(3) Smart design. You should be able to identify the inner and outer adjusting screws. (4) Looks. I prefer straight, simple cages to fancy contorted ones, and I don't need my derailleurs to look like they're moving when they aren't.

So—since front derailleurs all work fine, you might as well use something interesting, unusual, or discontinued. Will it shift as fast in a lab test as a Shimano? Nothing ever will. Will it shift fast enough on the trail and road? Of corsa!

FLASH! CACHE OF SIMPLEXES FOUND IN THE PHILIPPINES!

Don't get too excited—these are the funkier Simplexes I've ever seen. But they're so—out there—that I like them. A friend is testing one now; I'll get it back soon and test it myself. Then I'll make Spencer try it, too. If it works, I'll buy a lot of them and sell them really cheap. They are no substitute for the SLJ models below, but if you've always had a hankering for a red and white and chrome derailleur, drop me a note and I'll let you know if and when I get them.

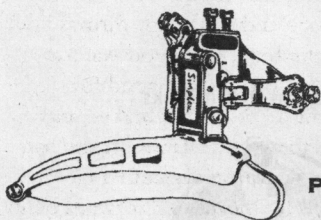
SUNTOUR TRIPLE FRONT DERAILLEUR

Remember SunTour? Remember front derailleurs? SunTour closed up recently. These are top-of-the line but unmarked models. No, that doesn't make them collectibles, but it does mean they'll move the chain from the 48 to the 36 to the 24t ring and back. Fits a standard 28.6mm seat tube. Priced up from last time, but still half the cost of what it ought to sell for. 111g.

PRICE: \$14

SIMPLEX SLJ TRIPLE FRONT DERAILLEUR

A rare, beautiful-in-a-French way touring/triple front derailleur for bikes with chainlines 47.5mm or less. Measure from the center of the seat tube to the middle chainring. If you get 47.5 or less, this will work. If it's up around fifty, save yourself \$16 and go with the SunTour. Any pre-1987 triple ought to do fine with this. 127g.



PRICE: \$32

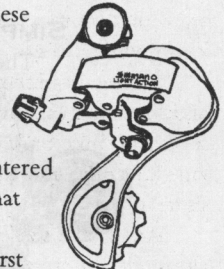
SIMPLEX SLJ DOUBLE/RACING FRONT DERAILLEUR

Same as above, but for double chainrings, and you can ignore the chainline warnings. This is a wonderful derailleur. I have it on the bike I ride everyday, and I sing its praises with every shift.

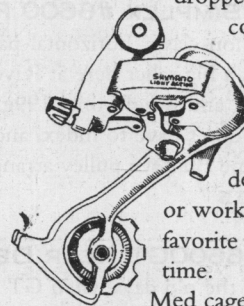
PRICE: \$32

SHIMANO L SERIES REAR DERAILLEURS

These rock solid, frills-free, fast-shifting Shimano slant parallelograms were conceived in 1983/4, when a dollar was worth ¥250, and Japanese makers could afford to use labor- and material-intensive methods. I think of them as Shimano before it sauntered into Las Vegas, took that first free drink and



dropped that first complimentary token into the one-armed bandit. Plain finish, all metal, kind of heavy, but tough and reliable. The perfect derailleur for any commuter or workhorse bike, and my second favorite Shimano derailleur of all time.



Med cage, capacity 28t, 288g

Long cage, capacity 32t, 311g

PRICE: \$24

HANDLEBARS: A BLURB

No bike part, not even the saddle, affects how you feel on the bike as much as the handlebars. A change of bar can compensate for a stem that's too long, too short, too high, too low. It can change your weight distribution on the bike, and suddenly your whole upper body is relaxed, where before it was tensed. It can make numb hands or a sore bottom disappear. It can make a long ride pleasant or miserable—and on and on.

And the funny thing about bars is that there is always a direct relationship between how they make the bike look and how they make the bike feel. Drop bars set low and forward make a road frame look ready for criteriums, but not as ready for a century ride or tour, and downright unsuitable for a trip to the store when you're going to be carrying the grocery back in one arm on the way back. Switching to a bend that rises up and sweeps back towards you makes the same bike perfect for that task.

Here's something about bars you don't often read: The harder you pedal, the less weight you have on your hands, so the less padding you need, and the less apt you are to get sore hands. A racer hunkering down in an all-out effort, trying to bridge a gap, barely even touches the bars (and saddle, for that matter). All the weight goes to the pedals, and the torso is so low, flat, and forward that it's most critical to get the bars out of the way. I don't know where to go with this, but it's something to think about.

"Mountain bike size" bars have 1-inch (25.4mm) clamp areas and 7/8-inch (22.2mm) grip areas. They fit rubber grips, and mountain bike brakes and shifters, but they're too skinny to just tape and ride, and the bore is always too small for handlebar-end shifters.

"Road bike size" bars are nominally 26.0 in the clamp area, although 3ttt are anywhere from 25.8mm to 26mm (which is why "nominally"); and are interchangeable with most Nitto, Scott, Specialized, and Modolo, which are 26mm on the nose. (I don't know why 3ttt's standard is 25.8mm -0, +0.2mm. They're Italy's best, and yet even crummy bar makers seem to be able to nail their bars to the nearest 0.1mm. I know there's a story, I just don't know what it is.) Cinelli is 26.4mm, and so you have to use a Cinelli bar with a Cinelli stem. The bar portion of road bars is

either 23.8 or 24mm in the grip—too fat for street and mountain fitments.

The most natural and most comfortable grip position is with your wrists pointed inward, the way they hang naturally. This allows them to bend fore-and-aft rather than the unnatural side-to-side movement that straight bars force them into. It matters mostly when you're rocking the bike side-to-side, as you do in off-the-saddle climbs and sprints. Road bars accommodate this position naturally, and straight bars don't.

Straight bars are excellent for sustained downhills on rough surfaces, in which case having all that bar in front of your palm keeps your hands from sliding forward, so you don't have to grip so hard just to keep your hands in place. On climbs, bar-ends help reduce wrist strain and increase your pulling power by giving your hands a wrist-inward grip. But bar-ends cause problems, too, with shape, and the way they hook shrubby, and the havoc they cause with some bars. I've always thought they were a temporary band-aid, an afterthought, an acknowledgement that the straight bar needs help; but they seem to have a life of their own now. If you want rainbow-anodized titanium bar-ends and are willing to spend \$150, visit your local pro shop.

Mountain bikes start out with disproportionately long top tubes and long stems partly because the flat bars that come with them make you feel cramped if they're too close. It has to do with the wrist-down position they demand. If your wrists are angled inwards, as they are on drops or Moustache Handlebars, you can grasp the bars much closer without feeling cramped.

The overextended wrist-in position that results with bar-ends (on a typical bike with a long top tube and stem) also throws your weight off. It's too far forward for climbing, since you want to weight the rear wheel enough for traction. It's not good for speed-riding, since it makes it difficult to reach the brakes, and nearly impossible to do so without taking your hands off the bar. A shorter stem combined with a bar that provides both a closer, wrist-in position and additional reach by means of a forward bend solves all these problems.

If you like what you're riding, don't change—of course.

NEW! NITTO MODEL 175 ROAD H'BAR

Few people have even seen a Nitto catalogue, and this bar isn't in it anyway. I haven't even seen it in any of the several special products fliers Nitto has barely circulated over the years. But I was asking Nitto for a bar that was "kind of like this, kind of like that" and out of my shadowfax popped a drawing of this bar. I probably should spend the Rivendollars on things that don't overlap existing inventory so much, and this bar is a lot like the 3ttt Merckx bend. There are differences, though—no cable groove, for one. Engraved logo, for another. A very slight criterium-style bend, too—not as much as a Cinelli 65 or a 3ttt Gimondi bend, and not enough to bug you if you don't like crit bends, either. Anyway, it's Nitto, so you know it's the best and most beautiful. From a foot away it looks like so many other drop bars, but I believe these are the only Mod. 175s ever to make it to America. No biggie. No weight yet—I haven't even seen one, but they're on the way based on the drawing. Probably about 310g.

42cm and 44cm (like a 3ttt 44 & 46). 26mm clamp diameter (on the nose, every bar).

PRICE: \$37—available June 15, I think, but orders accepted now.

PHONE: (510) 933-7304 FAX: (510) 933-7305

3TTT MERCKX BEND ROAD H'BARs

A modern, sleeved-and-cable grooved version of the bend Eddy the Merckx rode to more than 400 victories and who knows how many first places in charity rides. Over the years this has been the favorite bend of most who have tried it: not as deep as the deep-drop Cinelli 66, but deep enough for most hands, with a nice long, straight upper so your hands can roam freely. The actual drop, for those of you who are crazy enough to actually measure your bars, is 155mm center to center, or 179mm from the bottom of the drop to the top of the top part. Actual sleeve diameter is a curious 25.8mm, which 3ttt says has always been the case with its "nominally 26mm" h'bars. I did have one returned that measured 25.5mm, so from now on each bar gets measured. Anyway, this is the same 3ttt bar you can buy everywhere else, but I bought the last of the silver ones. Everyone else has "high tech grey." One final thing, again: 3ttt measures bars outside to outside, so a 44cm 3ttt bar is really a 42cm, etc.

44cm, 299g; 45cm, 301g, 46cm, 303g. I've dropped the price \$5.

PRICE: \$25

DIRTDROPS

By popular demand. I'm sorry the price went up so much. The first ones I bought cheap from Bstone; these I had to get at new, normal prices.

Designed with the DirtDrop stem for the 1987 MB-1. The key difference between these and normal drops is a 7-degree flare which begins below the curve. The flare is not that big of a deal, really, but it does increase wrist clearance a bit when you're on the drops and throwing the bike side-to-side. It is a subtle enough flare that you can ride these on a road bike and your friends may not even notice, and unlike some flared drops, the flare begins below the brake lever, so the levers don't tilt inwards. 42CM wide at the center of the curve; 48 at the ends. Made from high strength 2014 T6, a stronger alloy than regular drops, and heat-treated for flexible strength. A thicker wall adds extra security and weight. A very popular bend with everyone who tries it.

\$48 HEAT TREATED;

\$25 STANDARD <ROAD ONLY>

NITTO DIRTDROP STEM

A short, tall stem with a steep rise, originally designed for the drop-handlebar 1987 Bstone MB-1, and still ideal for any off-road use with a drop or Moustache H'bar.

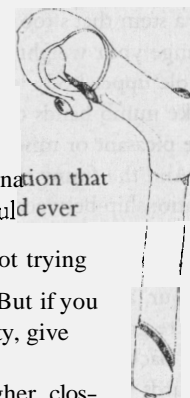
You don't want a long, low stem with these bars, because the bars provide most of the reach and drop. You need the bar high to take advantage of the bar's shape. By far my favorite off-road set up includes this stem with either drops or Moustache Handlebars—a comfortable, versatile combination that will have you wondering why anybody would ever ride anything else.

Listen, if you like flat bars, great—I'm not trying to convert you—ride what works for you. But if you find them not quite right or downright nasty, give this stem and a real handlebar a shot.

Also perfect for anyone who wants a higher, closer position with a road bar. Cold forged by Nitto from 2014 aluminum. Actual extension, 80mm; effective horizontal extension, 65mm. 335g.

Two versions: Decent finish and no cable-stop hole, **\$42**

Fancy finish, with cable hole: **\$52**



RITCHEY ROAD STEM, 90-DEGREE BCM, 10CM

I don't have many left, and I won't get any more, and in a bike shop they'll cost you twice as much. Fits 26.0 handlebars. 8cm, 262g; 10cm 276g **PRICE: \$32**

TRESSOSTAR CLOTH BAR TAPE

By popular demand? Of course not. But you know the real reason this fell out of favor, don't you?—because it's too hard for high volume manufacturers to wrap! But, sweating it out with some real adhesive-backed cotton bar tape is one of those rituals you've got to go through, if only for the experience. It'll make you appreciate the ease with which modern bar tapes go on. At the very least, consider it part of your bicycle education.

But now the good stuff: Good grip, good looks, good feel, weighs just 35g per bar (2 rolls!), it's been around forever so you know it's at least quite satisfactory, fades to nice colors, and if you ever get tired of it or wear it out, you can leave it on the bar as the perfect base for any other bar-wrap—prevents slipping. Real tough guys double-wrap both sides of the bar. Another idea: Single or double wrap you bar, then add a layer of Benotto over it, just like we did in the early 80's. The French tourists used cloth tape with lacquer over. Not all of them, but some. The boxes are wonderful. Black or blue only.

PRICE: \$6 for 2 (enough to do a bike), or 4 rolls for **\$11**.



MOUSTACHE HANDLEBAR

If you don't know how enamored I am with Moustache Handlebars by now, you haven't been paying attention to my ceaseless raving.

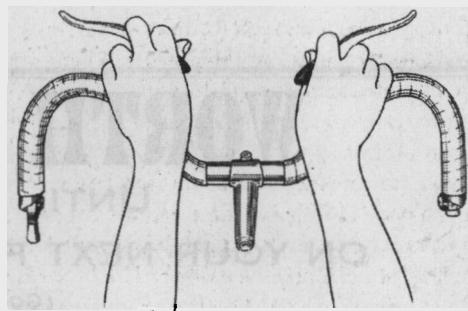
This basic shape has been around for more than a century, and makes as much sense as ever. This specific bend went through at least five prototypes and thousands of miles of testing and refinement. It offers the quick and easy braking position of a flat bar with the multiple hand positions of a drop bar—and is better than either for a whole lot of riding. You can go fast on the road and get more aero than you can with a standard drop bar. You can ride it off-road and access the brakes instantly, just as you can with a straight bar. It has been ridden to victory in **two** Iditabikes and **two** World Record 24-hour rides (John Stamstad) and the Chequemahegon Fat Tire race (Gene Oberpriller). More important, it has saved many bad backs and foul necks, and allowed many long-time road riders to continue riding a nice looking, multiposition bar, rather than the lowly straight style.

Available in both 26mm and 25.4mm clamp diameters, but otherwise identical. Bar diameter in both cases is 23.8mm, so it fits **all** road fittings and bar-end shifters. Does **NOT** fit thumb-shifters or normal mountainbikie stuff. If you don't know your

size, measure or call, we'll figure it out. Heat-treated and made from 2014 T6 aluminum by Nitto, the premier handlebar maker in the world.

321g (25.4mm) 323g (26mm).

PRICE: \$50



I LIKE TO SET THE ROAD BRAKE LEVERS SO THAT THE TIPS ARE ABOUT 13CM APART, AS SHOWN BELOW, AND WITH THE LEVERS HORIZONTAL. NON-AERO LEVERS ARE PERFECT FOR MOUSTACHE HANDLEBARS, EVEN THOUGH THE PICTURE SHOWS AERO LEVERS.

BENOTTO!

Yes, the real thing, the stuff everybody rode with from 1977 through 1979. Thin, easy-to-wrap unpadded tape for handlebar. Plastic, but surprisingly non-slippery. Tours de France were won with this. World Championships. Paris-Roubaix. And who can forget Greg LeMond's blue Gitane with the black Modolo brakes and the yellow Benotto? Down in my ranks, after every race there was at least one crashed bike near registration with uncoiling spirals of Benotto. The instructions say: Stretch tightly around the

handlebar. Heat end with flame and adhere to tape, pressing until it sticks. I gave up on that after one try, so did everybody I knew, so will you. Use Scotch™ brand adhesive tape, like everyone else (apologies to bees).

Hecho en Mexico, so you know this is the real enchilada: Benotto over Tressostar cloth is very nice. In three colors: lighter blue, darker blue, silver. Comes with bar caps. 37g per bar.

PRICE: \$5 per pk. specify color

BROOKS/RIVENDELL SADDLE

A spiffed up B.17, with Brooks Pro-thick honey brown leather, small copper rivets, chromed rails, and a rather ostentatious Rivendell Riders logo on the side. Nobody will ever know, and thank goodness it still has the Brooks nameplate on the back. This is without question the most comfortable saddle I've ever ridden, and if that weren't enough, it comes with Carradice-compatible loops built right in! There's too much plastic and not enough leather on your bicycle. Even the score!

The first fifty to order will receive a free eight minute video about the Brooks factory.

PRICE: \$60

CAMPAGNOLO 5MM ALLEN KEY

If you ride Campy parts, you might as well have the allen key, too. If you can't afford to ride Campy parts, console yourself with this most-affordable Campy-branded anything. It's never failed to fit. Get one before they fade away like all the other old Campy stuff. 20g.

PRICE: \$3

SUNTOUR 6-SPEED 14 X 24 PRO COMPE NON-INDEXABLE FREEWHEEL

Dead in the market, alive and clicking (*sorry*) at Rivendell. These are the brown ones, not the gold ones. The ones you used to think were real cheap. I like them because they don't have pre-worn cutaway teeth to encourage sloppy shifting habits and wear out faster; so in that way, I suppose, one could say these are Merckx-style freewheels. I bet he'd love *that*. 14-15-17-19-21-24

PRICE: \$15

WE HAVE A MAILING LIST OF 4,500, A PAYING CUSTOMER BASE OF AROUND 1,500 AND VIRTUALLY NO AD BUDGET. YOUR SUPPORT, REPEAT ORDERS, AND REFERRALS KEEP US GOING. THESE RIVENDOLLARS ARE OUR WAY OF THANKING YOU FOR YOUR ORDER, AND MAKING IT LESS PAINFUL TO SEND IN THE NEXT ONE.

WORTH FIVE DOLLARS

UNTIL AUGUST 12, 1995

ON YOUR NEXT PURCHASE OF \$25 OR MORE.

(GOOD FOR ONE PER ORDER.)

RIVENDELL BICYCLE WORKS

1547 PALOS VERDES, NO. 402, WALNUT CREEK, CA 94596 PH: (510) 933-7304 FX: (510) 933-7305

WORTH TEN DOLLARS

UNTIL AUGUST 12, 1995

ON YOUR NEXT PURCHASE OF \$50 OR MORE.

(GOOD FOR ONE PER ORDER.)

RIVENDELL BICYCLE WORKS

1547 PALOS VERDES, NO. 402, WALNUT CREEK, CA 94596 PH: (510) 933-7304 FX: (510) 933-7305

WORTH TEN DOLLARS

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ON YOUR NEXT PURCHASE OF \$50 OR MORE.

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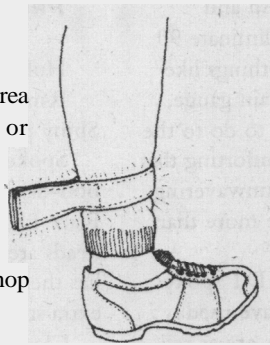
RIVENDELL BICYCLE WORKS

1547 PALOS VERDES, NO. 402, WALNUT CREEK, CA 94596 PH: (510) 933-7304 FX: (510) 933-7305

RAR

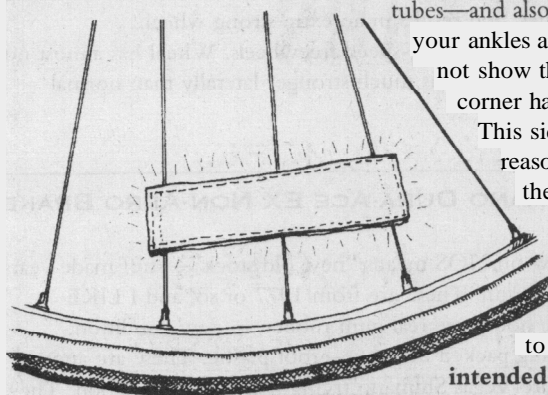
Rivendell Ankle Reflector. More reflective surface area per penny than any reflector. Stick them out into traffic, or behind your leg, for aerodynamics. Made from Reflexite, which, you already know by sight, if not by name. Adjustable to fit skinny, bare ankles or fat ankles with thick socks and jeans over them. Sewn by a family, not a sweat shop (apologies to sweatshop owners). Amberish yellow. 14g.

PRICE: \$5 EA.



RIVENDELL WHEEL REFLECTORS

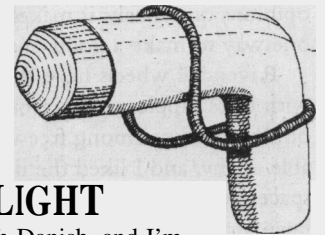
They don't throw the wheel off balance, don't interfere with a spoke wrench or spoke tension, and they go on and off in three seconds. I've used them for 13 years, even raced with them. They also attach just about anywhere on your bike—seat post, bars,



tubes—and also work as ankle reflector, unless your ankles are huge. Although the picture may not show this (so pay attn:), the outer rear corner has been lopped off and stitched.

This side goes towards the rim, and the reason for lopping was that sometimes the corner ticked against the brake pads, depending on the rim, spokes, and brakes, and your speed. It wasn't a big deal, never bothered me, but I didn't want it to bother you. White. Just 10.3g. **Not intended to replace CPSC models, etc.**

PRICE: \$5 EACH (PER WHEEL) OR 2/\$9



TESS HEADLIGHT

These are Danish, and I'm Danish, and that was the initial attraction. The second was that the headlight I had kept coming loose. The third was that this is the only light that fits anywhere on a bike. A distributor had some cheap. I called up and asked "Why *so* cheap?" I'd seen them in stores for \$16. He told me "Not Famous Brand." I said "That's all?" and he said "That's all." I bought them cheap, *so* I can sell them cheap. They're not for 20 mph singletracking on new trails, but they'll satisfy the law on streets and let you see most of the potholes. They go on and off in a second. The instructions say to use F14 batteries, but that must be Danish for C cells, because that's what I use. Takes two. Be the only person you know with something Danish on your bike. 201g with the not-included batteries.

PRICE: \$11

Q/R STAND

This is turning out to be the surprise of my life—you're actually buying these! Well, I appreciate it because they cost me nothing, and the \$5 price makes up for the low markup on normal things. Anyway, this is a Bstone device designed as a countertop device to learn how to use a quick-release hub. It has real, honest-to-goodness dropouts, brazed into the tubes by one of the ten best honest-to-goodness frame-builders in the country. It cost about \$28 to build. Makes a fine display stand for any unlaced front hub, and somebody really clever could convert it into a Rolodex. (Apologies to the Rolodex Corp., if you exist.) Nickel plated.

PRICE: \$5

WHEELS! COMING SOON, ORDER NOW

Everyone from Jobst to Ric to Kathy to Tim to Al to Vance to Brian to Chris agree that minimizing rear wheel dish and maintaining relatively high, even spoke tension **will** eliminate 90 percent of all wheel problems. But when it comes to things like lacing patterns, lighter butted spokes versus heavier plain gauge, what to put on the threads before building, and what to do to the nipples after building, the rhubarb begins. I find it comforting that **so** many smart people have such **wildly** different and unwavering opinions on wheels; it makes you think there must be more than one way to make a good one.

Rivendell wheels have Bullseye hubs, Mavic rims, DT spokes with brass nipples, and are built by Winkel. I could have used other hubs, but among Geewheel-style hubs, Bullseyes are as reliable as any, and I liked the flexibility in spacing the rear wheel spacer and washers. Mavic rims—who can fault them? They've been around since 1930-something, and hundreds of thousands of riders have ridden millions of miles on them. DT makes good spokes, and Winkel builds good wheels. Rivendell wheels are medium weight, **trouble-free**, totally reliable wheels you can ride on for years and years.

In order to get the price down I have to order lots of hubs, rims, and builds at the same time. I'll **try** to keep wheels on hand at **all** times, but in the worst case I should be able to have them out to you within a month. The road wheels are spaced to fit Rivendell frames (128mm dropout spacing), but work fine with frames spaced 126mm or 130mm. Likewise, the 26-inch wheels

NOS SHIMANO DURA-ACE EX SHORT-REACH BRAKES, COMPLETE

These are Shimano's first real entry into pro-grade parts. Old guys will remember the calipers with the vertical posts between arms—I always wondered why bother?—Campy brakes cost just about \$20 more. But I was a snob then, way worse than I am now. These are simple, pretty, excellent brakes. They aren't "jewel-like" but they're honest, paintless, anodized all metal, and worthy of any frame on Earth. The barrel adjuster on the caliper is ingenious, and it almost even makes sense. Maybe I just can't figure it out, but it seems as though the brakes open when the adjuster is down, rather than the other way around. In another life I'd explain it better. Suffice to say that Shimano has never been completely off, and never less than in the late '70s, when these were born. Nice brakes—I hope somebody puts them on a Rivendell road frame. I'm tossing a coin between these and the Gran Sports for my bike.

PRICE: \$80, and I have just 5 pair, so call in your order or at least pay by credit card.

are designed for Rivendell All-Rounder and Mountain frames with 132.5mm spacing, but work with either 130 or 135, as well.

PRICE: \$220 PER PAIR. Details follow.

Road Wheels

Hubs: Bullseye. Silver. 32H f/r

Rim: Mavic MA-2, the pre-anodized version of the MA40. Shiny polished silver for good braking. Ferrules.

Spokes: F: 2x DT 15ga. Rear: DT 14ga, drive side, 14 x 15 non-drive side. Rear wheel is spoked with Winkel's strongest Race Lace™ pattern—a four-cross pattern in which all the spoke heads are on the inside of the hub. According to Kathy W., this has the same effect as widening the hub flanges, and results in an extra strong wheel.

Clearance: Fits up to 7-speed freewheels.

A/R & Mtn Wheels

Hubs: Bullseye. Silver. 28Hf/32Hr

Rim: Mavic 217, silver, with eyelet. Newer rim, semi-aero, 22.5mm or so wide, seems to have it all, but I've not tried them. The best-designed 26-inch rim I've seen, and I trust Mavic rims!

Spokes: F: DT 15ga. Rear: DT 14ga, drive side, 14 x 15 non-drive side. Rear wheel is spoked with Winkel's strongest Race Lace™ pattern—a four-cross pattern in which all the spoke heads are on the inside of the hub. This has the same effect as widening the hub flanges, and results in an extra strong wheel.

Clearance: Fits up to 7-speed freewheels. Wheel has almost no dish, and consequently is much stronger laterally than normal wheels.

NOS SHIMANO DURA-ACE EX NON-AERO BRAKE LEVERS

From now on NOS means "new old stock"—stuff made years ago, but still virgin. These are from 1977 or so, and I LIKE THEM. The hoods are real gum rubber, in new condition, thanks to being packed in ozone-proof plastic. These are another example of pre-Vegas Shimano trying real hard to be good. They don't have the nice detailing and features of a Campy lever of the same era, but they're nice nonetheless. Think of them the same way you'd think of, say, a reel-to-reel tape of Madonna singing *Wouldn't It Be Lovely?* in a fifth grade talent show.

Many pros and top amateurs and a friend of mine rode these levers, and they're good enough for any bike made today. Gum hoods, remember—you'll probably never see them again. Fine for drop bars, and a perfect mate to Moustache H'bars. Factory-drilled for that "I have so little body fat that the only way I can take weight off my bike/body unit is to remove metal" look, but no less sturdy because of it. 204g/pair.

PRICE: \$18

NOS CAMPAGNOLO GRAN SPORT BRAKESSET, COMPLETE. \$60

Remember the Campy green boxes, the sign of Gran Sport, Nuovo Record's ruffian cousin? The scuttlebutt was that Italian juniors rode with Gran Sport, but nobody here in America did, I can tell you that. No bike shops sold it, and anyone who was cool enough to be riding in this country way back then either rode midlevel Japanese stuff or the Campy beige-box goodies. Green? Never!

But that's not to say it wasn't good enough. But riding Campy and not riding N. Record was sort of like getting desert boots that weren't Clarke's.

So what's the difference? These seem to be the same pieces, minus the polish. The hoods are black, dang, not gum. The worst part about Gran Sport brakes is the caliper quick-release. Nothing in all of cycling approaches the perfection of a Campy N. Record brake caliper quick-release; and so maybe it's unfair to even compare this to that—but you either already know or want to, so:

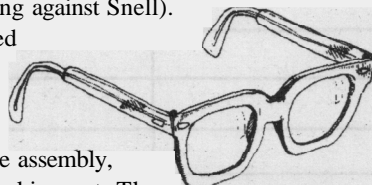
The G.S. q/r is not micro-adjusting, and it doesn't open the calipers as much as the N.Record's. This is a minor annoyance if you ride 700 x 32 or larger tires, but no biggie if you ride 28s and below. Also, no wheel guides, less well finished...but the levers are wonderful, the calipers are the same forgings, have the same wonderful shape....and they come with cables and housing. Ever the bad money manager, I bought 140 pair of them from a distributor in the Phillipines, and I've got to sell them, so I'm selling them cheap. Short reach (42/52) with through-bolts. Fits any even halfway normal road bike made today, including the halfway normal Rivendells. Do they work as well as a Shimano RX100 dual pivot? Of course not. Do they work well enough to provide 25 years of trouble-free service, and do they add appeal to any fiamme you put them on? Of course they do—they're old Campy! At these ridiculous prices, the best value in a brakeset today. (It is late at night, and I find myself sounding more and more like Trader Joe.)

PRICE: \$60

BOB SHADES

If there were such thing as non-indexed sunglasses, these would be it. Plain, but not in a stylish way. Optically correct polycarbonate safety lenses, OSHA approved—maybe it's ANSI; anyway, it's not SNELL (nothing against Snell).

Adjustable temples, real screwed hinges—a sign of quality, but unfortunately the factory apparently doesn't rub beeswax into the threads before assembly, because they have a habit of backing out. The good news is you can repair them with a safety pin or paperclip until you get to down to Thrifty or Wal-Mart for the eyeglass repair kit.



Strong, not too heavy, very comfortable. Pal Jeff says: "When I ride down a hill, the wind plasters them against my face. I like it" or something like that.

Two shades: Light green, for normal outdoor wear. Lighter than normal glasses, but fine; and Light grey, for those days when you really don't need glasses at all. Fine for indoors, too; or for shopping, when you have to go in and out of stores in the outdoor strip mall. Both with clear side shields, which we remove if you request. If you want them off after receiving them, support the temple piece, grab the shield with pliers, twist.

PRICE: \$8

KRYS HINES CAMPY KEY FOBs

I'm almost embarrassed to sell these, and I wouldn't be selling them at all if they were the N. Record ones everybody else has. I think those shifters should be ridden, not carried in your dang pocket. (If you ride them, you have the right to keep a spare as a key fob. If you ride indexing and have never even tried them, you don't. That's as judgemental as I get.) Anyway, pal Krys Hines in Toronto was going to make N. Record fobs for a department store. Then people would buy them like RURPs*, for crying out loud! He didn't want to, I didn't want him to, so I bought even more N. Record dt shifters from him, to protect their fate and his fate (apologies to agnostics). In place, then, he got these Campy Syncros II shifters—those foibly ones that Campy made in 1987 or so, the ones that were touted as being compatible with all indexed systems, so long as you had the patience of a snail to figure out the correct combination of internal guts to use with which set of cogs and chain. Anyway, I have no qualms whatsoever selling these as key fobs. They come with a nice chain, and are compatible with all keys. (Krys, by the way, is the BOB who located the SunTour bar-end shifters for me. So if you bought them from me, both of us owe him a favor. I'm doing my part....)

* a one-inch square climber's piton developed for the West Face of Kat Pinnacle, if memory serves. More have been sold to hang from rear view mirrors and as key fobs than for climbing, but maybe that's not such a bad thing.

PRICE: \$10

Rivendell Bicycle Works (a growing concern!)

1547 Palos Verdes #402 • Walnut Creek, CA 94596

PH: (510) 933-7304 • FAX: (510) 933-7305 • email Rivbici@aol.com

Name _____ Order Date _____

Address _____ City _____ St — Zip _____

Day phone:() _____ Eve phone: _____ Fax or Email? _____

MAILABLE, FAXABLE, COPYABLE PARTS & ACCESSORIES ORDER FORM

Qty Size Item and Necessary Detail Each Total

| Qty | Size | Item and Necessary Detail | Each | Total |
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| Name & address of a friend who might like the RR: | | first subtotal | |
| | | minus any Rivendollars or GC | |
| | | second, possibly lower subtotal | |
| | | tax- (Ca only) | |
| | | shipping (see below left) | |
| | | tooling contribution (buys coupon worth 10% more) | |
| | | membership (\$20; or NOW, JUST \$15 with order) | |
| | | TOTAL \$ | |

| SHIPPING | | |
|-----------------|--------|------|
| | GROUND | AIR |
| I US | \$5 | \$12 |
| CANADA | \$15 | \$22 |
| INT'L | \$25 | \$45 |

Payment

Check or M/O No. _____ Amount: _____

VISA # _____

MasterCard # _____

Expires (Month, Year) _____ / _____

RIVENDELL BICYCLE WORKS FRAME ORDER FORM

FRAME STYLE: ROAD ALL-ROUNDER MOUNTAIN

SIZE:(C-TO-T) 50 42 16
 52 48 17.5
 54 52.5 19
 56 54 20.5
 57.5 55.5
 59.5 58
 62 61

COLOR: ONE-COLOR (\$895) TWO-COLOR (\$995) AMOUNT: _____

- | | | |
|---|---|---|
| <input type="checkbox"/> CHAMELEON GREEN/PURPLE \$995 | <input type="checkbox"/> SILVER <input type="checkbox"/> LIGHT BLUE MET. <input type="checkbox"/> RED <input type="checkbox"/> BRIT. RACE GREEN <input type="checkbox"/> CREAM <input type="checkbox"/> GOLDEN OLIVE PEARL <input type="checkbox"/> PINK <input type="checkbox"/> MUSTARD <input type="checkbox"/> BURNT ORANGE | <input type="checkbox"/> BURNT ORANGE/BLUE <input type="checkbox"/> MUSTARD/BLUE |
|---|---|---|

OPTION: PHIL WOOD BOTTOM BRACKET INSTALLED (ADD \$1 15): _____

OPTION: STRONGLIGHT X-12 HEADSET INSTALLED (ADD \$40): _____

SHIPPING: \$20

TOTAL: _____

WHAT CRANK AND CHAINRINGS WILL YOU BE USING? _____

MONTH YOU WANT TO RECEIVE YOUR FRAME: _____

LATEST YOU WILL ACCEPT YOUR FRAME: _____

(PLEASE FEEL FREE TO INCLUDE ANY NOTES ON A SEPARATE SHEET WITH YOUR ORDER.)

NAME: _____

ADDRESS: _____

CITY, STATE, ZIP: _____

DAYTIME PHONE: _____

EVENING/WEEKEND PHONE: _____

DATE ORDERED: _____

PAYMENT:

CHECK MONEY ORDER

VISA MASTERCARD

CARD NUMBER: _____

EXPIRATION DATE: _____

SIGNATURE: _____

TO ORDER: SEND A \$300 DEPOSIT BY CHECK OR CHARGE. WHEN WE RECEIVE IT YOU GO ONTO A LIST FOR FRAMES OF THAT SIZE AND TYPE. THERE ARE FIVE OR SIX OF EACH SIZE AND MODEL AVAILABLE EACH MONTH, AND WHEN ONE MONTH'S ALLOCATION IS SPOKEN FOR, WE PUT YOU DOWN FOR THE NEXT MONTH. EXPECT TO WAIT 45 TO 60 DAYS. THERE IS A LAYAWAY PLAN, ALSO. IF THIS INTERESTS YOU, PLEASE CALL OR WRITE FOR DETAILS. THANK YOU, GRANT, SPENCER AND MAGGI

SEND TO:
RIVENDELL BICYCLE WORKS/FRAME ORDER
1547 PALOS VERDES #402 WALNUT CREEK, CA 94596

PHONE: (510) 933-7304 FAX: (510) 933-7305

RIVENDELL BICYCLE WORKS
FRAME ORDER FORM

| FRAME TYPE | PRICE | FRAME NUMBER | OPTION |
|------------|-------|--------------|---|
| Standard | 145 | 101 | None |
| Dropouts | 155 | 102 | Dropouts |
| Light | 165 | 103 | Light |
| Light | 175 | 104 | Light, Dropouts |
| Light | 185 | 105 | Light, Dropouts, 28" wheels |
| Light | 195 | 106 | Light, Dropouts, 28" wheels, 28" handlebars |
| Light | 205 | 107 | Light, Dropouts, 28" wheels, 28" handlebars, 28" seatpost |
| Light | 215 | 108 | Light, Dropouts, 28" wheels, 28" handlebars, 28" seatpost, 28" fenders |
| Light | 225 | 109 | Light, Dropouts, 28" wheels, 28" handlebars, 28" seatpost, 28" fenders, 28" chainrings |
| Light | 235 | 110 | Light, Dropouts, 28" wheels, 28" handlebars, 28" seatpost, 28" fenders, 28" chainrings, 28" pedals |
| Light | 245 | 111 | Light, Dropouts, 28" wheels, 28" handlebars, 28" seatpost, 28" fenders, 28" chainrings, 28" pedals, 28" tires |

OPTION: THE GOOD BOTTOM FRAME IS INSTALLED AS STANDARD.

NAME _____ ADDRESS _____ CITY/STATE _____ PHONE _____

DATE OF ORDER _____ SIGNATURE _____

TO OBTAIN A QUOTE, SEND THIS ORDER FORM TO RIVENDELL BICYCLE WORKS, 1547 PALOS VERDES #402, WALNUT CREEK, CA 94596. WE WILL RETURN YOUR QUOTE WITHIN 5 BUSINESS DAYS.

RIVENDELL BICYCLE WORKS, 1547 PALOS VERDES #402, WALNUT CREEK, CA 94596

RIVENDELL BICYCLE WORKS
1547 PALOS VERDES #402
WALNUT CREEK, CA 94596

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