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Queen of the Mountain

Interview with Jacquie Phelan

by Jan Heine

Among the pioneers of mountain biking, Jacquie Phelan is a larger-than-life figure. Not only did she win the first three U.S. championships, but she also was known for her non-conformist approach to the sport. Whether it was racing with a furry duck mounted on her helmet (at a time when most racers did not wear helmets at all), or posing for a RockShox ad clothed only in mud and a string of fake pearls, Jacquie did not go unnoticed. Yet few people know about her background and her partnership with Charlie Cunningham, whose bikes she rode to three National Championships. When I wanted to borrow her cherished bike "Otto" [pronounced "auto" – get it?] to photograph it for our book* The Competition Bicycle, *Jacquie told me that the bike never left her care, but that she'd love to come to Seattle for the photo shoot. That is how I met the incredible Jacquie Phelan.

JH: How did you get into bicycle racing?

JP: Because I am good at it.

JH: How did you find out that you are good at it?

JP: I got around by bicycle. It was cheap and easy. Mom wouldn't chauffeur us anywhere. In Los Angeles, that could be considered child abuse. I had a great little bike – a Peugeot UO-8 mixte. White. Très chic. I was able to do these huge rides as a teenager, from our place in Tarzana (a subdivision in the San Fernando Valley) over to Malibu Beach and back. Nobody told me, because I was doing it by myself, but that is a pretty decent ride for a 16-year-old.

JH: You did it just for fun?

JP: Yeah. To see what the weather was like, and how the beach looked, because I wasn't allowed to drive Mom's Camaro. Then there was a little hiatus for the college years. I didn't have a bicycle. I didn't realize that I could have brought a bicycle to my college in Vermont. When I got done with college and moved to the city, I bought a Raleigh girl's bike, a 5-speed Raleigh Sprite. It was a mid-60s bike, the kind that hangs in somebody's garage. It was my co-worker's. She never used it, so she sold it to me. I rode that Raleigh Sprite everywhere, up and down all the hills. My friend Darryl Skrabak saw that I had a lot of racing potential, because I could outride people on skinny tires, even on the hills. He took me to my first race, January 1, 1981. And I won it.

I beat all my (male) riding buddies who were strong but not racers. I was probably 20th of 60 riders. It was a massed-start race, with results posted an hour after the finish. Years later I learned the term "January National Champion," somebody who is in great shape in January, and cooked by summer racing season. As far as I was concerned, it was an incredibly auspicious beginning to a new chapter in my life. The academic track was looking pretty bleak.

JH: How did your racing career continue?

JP: When I started, some guys like Darryl, Allan Wilson and Gary Fisher helped shape me into a real biker, but a few women were bummed that I hadn't paid my "five years of dues." I won nearly all the road races I was entering. Then, after I broke up with Gary, the Marin mafia were the ones who wanted to shut me out. In fact, Maynard Hershon wrote a whole story about that. I was too weird.

JH: I read it in VeloNews. They didn't like you because you had a furry duck on your helmet...

JP: For everything! Because I did not conform.

JH: Why did you not conform?

JP: Well, I didn't have money for the fancy

Previous page: Jacquie Phelan at the Buckhorn Summit Race in 1984. She is riding her first Cunningham bike (with Mafac cantilever brakes instead of Roller Cams and a painted frame).

Jacquie at the third NORBA National Championships, Santa Barbara, 1985. She won.

clothing. And it felt great to be as good as somebody else wearing the wrong things and on a bike that was the wrong size. It's even more impressive.

JH: But you could still ride the wrong-size bike and not have a duck on the helmet. Were you making fun of people?

JP: No, I wasn't. The duck on my helmet was a holdover from my commuter days, when I needed a survival strategy for the street. If people are pointing and laughing, they are not going to kill you and say they didn't see you. When I wore that big, white Bell "Biker," people asked: "Are you planning on crashing?" I said: "No, I am just keeping my Bachelor's of Arts in one piece."

My first serious race was the Cats Hill Criterium. Gary [Fisher] took me there to make my grand entrance, with thousands of spectators and an announcer saying: "See all the women in the green jerseys. Those are the Berkeley Bicycle Club women's team. Look for the winner among them."

I won the race easily.

JH: How did you get so strong? Was it natural ability or did you train hard?

JP: I think I had a natural gift. I am a stand-out athlete, but I was held back when I was a kid. My dad didn't like the idea of "trained seals." He saw athletes as "barely educated, conservative people." So I had to wait until I got out of college and beyond before I could explore that.

JH: How long did you race on the road?

JP: I was going for the Olympics in L.A. [in 1984]. Starting in 1981, I raced very hard for four years, trying to figure out how to qualify. But there are certain things you just cannot do.

I had a hard time making friends with my competitors. Some of them really suggested I take up tiddly winks, or windsurfing, or any other sport than "their" sport of cycling. I guess it's understandable – novices crash a lot. Crashes affect the entire race. I certainly forgive the women now. The women who asked me to take up a different sport were

different from the men who asked me to disappear. Women were terrified of my falling at speed. Men were afraid I'd make them look weak.

JH: During your racing days, how did you train?

JP: I rode with guys who helped me learn how to draft, etc. I rode everywhere for transportation anyhow, and I raced on the weekend. Gary Fisher was my first "competitive date." We had gone for a few rides, and at that first race, Gary and I got together. For five months, we raced every single weekend, and he was my coach. So I immediately became disgustingly good, went to Nationals and did well there. It was a very steep trajectory. I had no idea how to do criteriums, so Gary whispered in my ear: "Go hard this lap, go easy that lap..." I couldn't win on the bell lap [for the intermediate sprints], because I didn't know how to sprint. So he had me go hard the lap before, and I got way out in front, and then I would stay in front. Even though a sprinter or two passed me, I ended up inevitably getting points. And by the end of the race, I had a lot of points. [The rider with the most points, not the winner of the final sprint, won the race.] People laughed and said: "Let her dangle out there by herself," but they quickly learned how strong I was and how "dangerous" I could be. That was a stage race, and I won it. Then there was the women's "Safeco" race, aimed at the "lesser" categories, for women and seniors. In the time trials, I beat all the men and the women. I came fourth in the criterium and won the road race.

Everybody was mad, because I had crashed my bike and used Gary's to continue. They protested, and even though there was no rule against that, Gary said: "Take the penalty, you'll still win." He was right. They docked me a few minutes, but I had such a big lead that I won anyhow. And [I] won money, like crazy. That was funny, because Gary had raced for 15 or 20 years, since he was 11, and he'd never won. The best he'd ever got was second place. So he was not happy either, because I was doing so well without training. At the Cats Hill Race, he got tenth, but his prize was about ten times the value of mine. I learned a lot about what women get for winning.

It's a strange men's club, bicycle road racing. During my formative years as a bike racer, one of my friends told me that I'd never get anywhere, because I didn't know how to fix my bike. He tried really hard to teach me how to pack the bearings and do all that stuff. I just never got it. I said: "You mean that a six-pack of beer is not going to help me get my bike fixed?" I figured out a workaround – I married Charlie [Cunningham].

JH: Tell us about that.

JP: Gary [Fisher] actually introduced me to Charlie. He wanted me to get out on a mountain bike that was better than my Raleigh five-speed – which was a fine mountain bike, by the way.

JH: The girl's bike you mentioned?

JP: Yes. I had done the 25-mile Pine Mountain Loop, and ridden home again. The Pine Mountain Loop is the epic off-road ride, and I was stronger than most of the guys. Fisher thought it would be more fun if I was able to keep up with him and train on dirt. One day, he said: "There is this bike my friend Charlie has, 26-inch wheels in the front, 20-inch in the back, we'll borrow that." So I borrowed Charlie's Bobtail, rode around after Gary, and thought: "What a nice guy that Charlie was." Charlie had a girl-friend, and I was with Gary. About a year later, I called up Charlie and asked him to show me the way down Mt. Tam in the moonlight.

It's a guaranteed seven miles downhill. I had ruined my knees overtraining for the 1982 season, so going flat or downhill were my two options, if I wanted to enjoy my bicycle. I packed a picnic, and friends from SF drove me and the bike to the top of Mount Tam. Charlie came up the back side by bike, with his friend Sandy Haig from Crested Butte. Afterward, we pointed down the back side of Mt. Tam, and within two minutes, I realized it was a race. I was on my Raleigh girl's bike. Charlie is naturally cautious, but he was the only one with a light. It was a full

moon, though. I didn't quite keep up with him. Once or twice I crashed, picked myself up. It was love by the bottom. It took about six months before I moved in.

JH: Did racing down Mt. Tam get you started in competitive mountain biking?

JP: During the five months with Fisher in 1981, I was getting really unpopular with the ladies in the pack. One race was two crits [criterium races] in a row. I usually won the road race, and then made it through the crit. So two crits in a row were not appealing, and I looked for alternatives. Gary said: "There is a mountain bike race happening in Shasta, called Whiskeytown. Let's do that. We'll borrow a bike for you." I ended up winning that, taking seventh overall. I thought: "This was a lot more fun. The people are laid-back."

JH: Why was it more fun? Did you enjoy riding off-road more, or were the people nicer?

JP: When we pulled the bikes off the truck – it was one of those things where you were trucked to the top of the mountain – my bike had a flat tire. The guy counting down [for the start] stopped and asked the crowd of racers: "What are we going to do." They all yelled: "Fix it!" Everybody waited for the five minutes to get the new tire on. I thought: "I like these people." It was overwhelming. On the road, the motto was: "The fewer people race, the better for me." For the mountain bikers, it seemed like: "The more, the merrier." It felt like I found my tribe.

I learned how to go downhill a little bit better. I was always passing the same three people, including Holland Jones from San Francisco, who sold Jack Taylor bicycles.

JH: Why the focus on racing?

JP: Well, if you are good at something, why not find out how good you can be? There are byproducts. Fabulous physique. Beat men in a ritual manner, and they aren't allowed to complain about it.

I had a good time. Be good at something, and get something tangible for it. I only got tangible things in school, with grades. But after school, I was sort of lost in space, and didn't know what to do with my life. My career as a receptionist was on the skids... It hadn't occurred to me to work in advertising and take advantage of my writing skills. I didn't know I had writing skills until I started writing "Life in the Fat Lane," a monthly column in *Bike* magazine.

JH: Let's get back to racing. When were the first Nationals?

JP: In 1983. We founded NORBA [National Off-Road Bicycle Association] as an advocacy group, because we were getting shut out of the trails. Joe Breeze designed the logo. Then a guy on the Central Coast, Glenn, wanted to form a governing body for racing. So a little deal happened that allowed him to use the name and logo. He was in a rush to have a championship in 1983, so he had them on my birthday, December 10, in the rain, in Santa Barbara. There were people like Alexi Grewal and Steve Tilford and all these road racers, who had been summoned and been issued bicycles that did not work. Because of the heavy rain, they cut short the men's race. Steve Cook was riding a Cunningham, and he might have won, but he needed all the roadies to die on worthless brake pad compounds. When they shortened the race from five laps to three, Steve Tilford was at the front and won. For the women, we all knew who was going to win, so we said: "Let's just do two laps."

Anyhow, the second one was in Colorado, the third in Santa Barbara again. I won all three of them.

JH: How many women were at the start?

JP: It doubled each year. Three the first year, six the next, twelve the third.

JH: How much competition was there for you?

JP: For six years, I beat all the women all the time. But more to the point, I beat 90% of the men in those stampede-style races.

Cindy Whitehead's goal in life was to beat me. She was a road racer when I was a road racer. She was pretty strong, but not skilled. She hadn't figured out the dirt stuff yet.

She took years to beat me. She definitively treated bike racing like a job.

But luckily, Susan DeMattei showed up pretty soon. Her first race was Easter 1987, and we rode the whole race together. We became friends right then as I coached her down the creekbeds and up the other side.

JH: How did you develop those skills? You said you were nervous in criteriums. How did you get good on dirt?

JP: I guess I watched others ride, especially riding behind Charlie. I got my chance to race on the road in international-level competition again at the Ore-Ida stage race. I had people ask me: "Can I ride behind you on the downhills, because you have such a good line." It was the opposite of what it used to be. Somehow, I developed those skills. Charlie likes to ride very technical single track. I noticed the more years I rode – I rode both on and off road all the time – the easier it was for me to do technically difficult stuff. I was getting better from practice. And having the same bike for all those ten years doesn't hurt, because then it is like your lower half.

JH: Tell me about the bikes. What were you asking from your bikes?

JP: I hadn't ridden many bikes before I got Otto, my Cunningham. You know about mechanics, it is exactly the right weight distribution. Double chainrings instead of triple, so I got better shifting. I didn't even have to be that good technically. The long handlebars and the curvy shape are sort of like a suspension system, although I didn't know it at the time. The brake hoods functioned as an extra hand position, because they hadn't invented Onzas [bar ends] yet. The smaller frame with the sloping top tube, they all pointed and laughed at it. And of course, "aluminum could break any minute."

JH: The Cunningham worked really well for you?

JP: Yes. It was in the context of ridicule and envy. Some people knew it was a great bike. People who wrote for magazines didn't know... Many thought I was on the world's ugliest bike. "Why doesn't she at least paint it? And with those drop bars, it's not even a mountain bike." It worked perfectly for me, and it continued that thumbing-your-nose tradition. Tom Ritchey personified that. He was deeply insulted by Charlie's bikes. He told Charlie that they would come back to bite him, because they were too light. I figure that after ten years of competition on the same frame... In fact, Tom's bikes literally dissolved under him in racing conditions when he was learning to build as a teenager. They just cracked in the final laps of the criterium, or under the pressures of the sprint in a road race.

JH: So you are saying that even the mountain bikers at the time had developed an orthodoxy?

JP: Yes. They hated it when I showed up with the Raleigh girl's bike and the helmet. "The

Photo: Jean-Pierre Praderes

Right: Jacquie and Otto (the bike) in 2008.

bike is the wrong bike, the basket needs to go, and the helmet, what is that for? And skinny tires? We are going on a dirt ride." And I thought: "Yeah, and you need to get in a truck to get up the hill. I think I'd rather ride." I think I was meant to be out-of-phase. A tiny, off-beat character to shake things up. It has turned out to be part of my role.

JH: Why do you think that is?

JP: It's natural for me. I am a show-woman, I am an entertainer.

JH: So you are creating your role by not fitting in?

JP: I am a clown. Racing, for many, is a big boys' version of war. But for me, it's not war, it's a tea party. I think we are doing it so we can have fun. Yet when the gun went off, I was all business. I was going to pass that guy in front, especially if he had issues with a woman passing him. You could tell, when they were riding over their heads, because their handling went bad. I'd give them a little space, let them have their little crash, go by and apologize with a little "Sorry." I am sorry if they cannot handle it. I have a really strong urge to compete, and [bike racing] is considered a healthier outlet for it than war.

JH: When did you stop competing?

JP: I never did. I now compete only at the world's level. Once a year, I do the world single-speed championships.

JH: Why single-speed?

JP: Because those guys love me. No corporate sponsors. I probably would do mountain bike at the world level, if somebody wanted me there. But they probably are happy not to have me there. And I want to be wanted. In fact, I require it, because I cannot afford to pay for my own way to the races.

JH: What else do you do these days?

JP: I still don't have a clear career goal. I sell a story from time to time. Racing obviously has totally washed up. I am trying to write two books. One is a "How to" for beginning women, who have totally forgotten how to ride. It's been 40 years, and their doctor has told them to get fit, but they hate exercise. That one is done, and I am just trying to find a publisher who thinks a 4"x4" velvet-bound chapbook is a great idea. The other one are my fabulous memoirs, which are mostly written. But pulling it all together is really hard for me.

JH: Tell me more about getting women to ride. There are more and more women riding, but participation at events does not seem to increase that much. Is it that women don't have a need to go to war?

JP: Well, for me, it's a case of window dressing. If you put enough pearls on it, and serve tea and china, and make it sound like something that is safe and fun, they will come stampeding over to your little tent. And that is what happened.

JH: You seem like an odd person to serve tea and pearls...

JP: That is part of my feminist joke. Because I am sort of androgynous. It's not like I have a moustache, but I have your Bernard Hinault body: 140 pounds, 5'9", perfect for climbing hills. But androgynous. Cindy Whitehead was voluptuous, and there was dancing in the streets when she finally beat me, because finally a real woman had won a mountain bike race. I was like this third gender.

Because of my academic foundation, [to me] a bicycle is a tool, using technology to liberate women, just like it had been 110 years ago. How to reenact this, because we still have so far to go with patriarchy and all that. Let's have a little fun with it. Women now do ride bikes – it's not as revolutionary as it was back in the 1880s or 1890s. Back then, the guys were banning women from sports altogether. There were people like Tillie Anderson, who was winning races at age 16, and then they just banned women from racing, because she made men look bad. Tillie Anderson was inducted into the U.S. Bicycling Hall of Fame in 2000, the same year as I. I had never even heard of her before then.

I inherited more than just legs from my parents. I do think it's possible to see your-

Photo: Gordon Bainbridge

Passing the guys was part of the fun. Jacquie makes her move in 1984.

self as one of those Victorian ladies on the bicycle poster, with a halo held over your head, the Truth or something. That is how I see myself – I had to be the best. Since I already hung out with people like Connie Carpenter and stuff, who were the tippy-top road racers, and experienced their incredible chilly reception and lack of welcome of new riders, I thought: "If I ever get to the top of something, I am going to be so different. I will remember everybody's name, I will shake their hands, and I will tell them how much they pushed me." What can you say if you beat somebody? You want to make them feel good. "Oh, and by the way, tea and cheese danish at my place on Sunday." I was just doing that out in the woods, handing out cards to women I saw. Some people kept the cards for three years on their fridge, and finally showed up for a ride. It takes a leap to go for a ride with a stranger. It developed one rider at a time.

In the beginning, it was sort of a small sport, and people like Charlie Kelly would say "the world's smallest," because only the *Fat Tire Flyer* [newsletter] existed. And then that disgusting thing down south showed up, *Mountain Bike Action*. They pretty much made it sound like they invented mountain biking. And it was all sort of like motocross-style riding and BMX, which coincided with when Glenn O'Dell sold his second version of NORBA to a BMX-governing body, the AMA of Arizona. From that point, everything for the women went totally downhill. Racers were becoming just like data entry points, to make money off. And then there was this wild woman who asked for equal prize money...

JH: Tell us about the women who came after you. There were women who dominated just like you did, afterward, like Juli Furtado. Did you know them?

JP: Oh yeah. I was racing with Furtado in her first mountain bike race. After that race, I went and found her, because she had done really well. In 1990, the national champion-

ships on the road were in Park City. So the next day, all these women thought they could try mountain biking. They had never done it before. It was definitely a different feeling. The pack was twice the size, and the racers were screaming at each other. They were terrified that they might get hurt. At the finish, I knew there was this amazing rider, so I went and found her, sitting on the ground. I asked her name - "Furtado." I recognized her as the next champ. Impulsively, I grabbed her hand and gave it a kiss. I knew a queen when I saw one. I knew that this gal was going to go past Sara Ballantyne. Back in 1990, Specialized was banking everything on Sara, but they were running her ragged in Europe. Furtado was able to win the first world's [in 1990] because Specialized overused Sara, and then expected her to do well at the world's.

Of all the other women after me, I never met any crusader types, except Missy Giove. She had definitely had all the same showmanship, support of women, outrageous behavior and incredible talent. And she gave women money. I also used to give women a little money, I would sponsor riders. I saw a roadie, Susan Healy, and thought: "If you just come to the world championships in Bromont, you are going to do well. I will find you a bike, I will give you shoes. Just take one day off from medical school and go to the world's." She did just one race in her entire mountain bike career, and that was the 1992 world's. She had a great time. She got 33rd, but she got to race the world championships. I got to orchestrate that.

We met in the heavy competition of the Ore-Ida, where there was a lot of yelling and stress, where it was more like a job. That year, the Australians were busting their butts, and Kathy Watt took the Olympics in Barcelona. She served notice at that year's Ore-Ida. Back in the pack, the Wombats [Women's Mountain Bike and Tea Society] team was just trying to get in some miles and have a good time. We got an incredible amount of ink from the *Idaho Statesman*, because we were just so quotable, and funny, and photogenic. "We are just here for fun, and because we want to race in the greatest women's race in the world. We are mostly doing it to train for off-road."

While I haven't seen any crusaders apart from Missy, every woman has followed my template and done mountain bike camps, to encourage women to enter the sport. I don't see that among the men. There is a collaborative part to competition, where more good riders will make us all better. The Wombats aren't even about competition, but about having a good time. Forget about your crappy job and all that. Be out in nature. Defining mountain biking as a pastime instead of a sport.

Jacquie's WOMBATS can be found at www.wombats.org, and her blog is at http://jacquiephelan.wordpress.com

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My first exposure to Charlie Cunningham's genius came when I assembled Jacquie Phelan's bike for a photo shoot. Working on the bike, I noticed many clever details, innovative ideas and improvements to existing parts. Where most "Fat Tire" pioneers used existing road- and touring-bike components, Cunningham started almost with a clean sheet of paper when building his mountain bikes. His holistic approach to bicycle design matches that of the French constructeurs, and perhaps not surprisingly, some of Cunningham's designs are similar to old French solutions to the same problems. I called up Charlie to learn about the thinking behind his amazing machines.

JH: You are one of the pioneers of the mountain bike movement, but you have developed in a very different way from the other guys. While they copied and modified Schwinn Klunkers, you designed lightweight mountain bikes from scratch. Tell me about your origins with bicycles and mountain bikes.

CC: I got interested in bicycles because they allowed me to access the natural surroundings around here more efficiently. My mom had a German-made single-speed bike. It had a girl's frame, but it was really well-made, with a frame out of high-carbon steel. I rode that a little bit and then put gears on it, to make it more suitable for the single-track riding around here. I used it to explore Mount Tam and Pine Mountain, and to learn my surroundings in much greater intimacy than I would have been able to do on foot, given the same amount of time. There are lots of trails in this area, and back in the early 1970s, nobody was riding on these trails.

The first bike I built was a folding bike made out of Cromoly steel, with 20" wheels. It was a really neat bike. I built two of them. They are quite small, and go in a little ripstop nylon bag. You can't really tell from the outside that a bicycle is inside. You can take it on a bus or an airplane. It rides a lot like a track bike. It is a high-performance, nice-handling bike, and it breaks down with a frame clamp similar to the one Tom Ritchey is using [in his Break-Away system].

In about 1978, these things people called Klunkers started to appear. They really were "Klunkers," really heavy. The only thing that made them interesting was that they had gears, and fat tires. But the tires were really inadequate: They had a flat tread and really poor traction. The rims were steel, and the things were just turkeys except for going downhill. I would occasionally encounter them on my trail rides on the back side of Mt. Tam, and I'd be faster and more efficient on my bike. I had a cyclocross bike at the time, a Motobecane road frame. I chopped the chainstays, which raised the bottom bracket at the same time. I made a brace in the frame to stiffen up the bottom bracket, and I made my first set of custom brakes for that bike. It had a miniature toggle brake on the rear [see page 43]. I was riding tons of singletrack on this bike, and I'd run into people on Klunkers now and then, who were ambling along at half or a third of the pace I was doing, expending a lot more energy.

I got interested in building a mountain bike when two things happened about at the same time. Ukai came out with a wide 26-inch rim made from aluminum alloy. I think it was about 1.75 inches wide. CyclePro came out with the "Snakebelly" tire, which was the first skinwall fat tire with a pretty decent tread on it. It certainly was way better than anything available before. So I was thinking: "Wow, this is a light wheel, and it could be the heart of a really nice bicycle."

Typical to my nature, I started from scratch. I spent a lot of time thinking about it. I decided I wanted to use aluminum, because I felt it would be a lot lighter and stronger and longer-lasting that way. I had ridden enough of these existing Klunkers to know the areas where they needed work – pretty much everything. I completed my first mountain bike in 1978, I think, in time to go out to the Crested Butte-Pearl Pass Tour with it. It was incredible to ride, a whole new experience. It is so hard to imagine riding a bike that is like a Formula One racecar, a bike that does things that no other bike prior to

that could come close to doing. It was just unbelievably fun. That bike is in the Crested Butte Museum today. It looks pretty darn close to Otto, Jacquie's bike.

JH: Tell me about a few of the design characteristics. Why did you use oversize tubing? To make it stiff?

CC: Yes, to make certain parts of it stiff. I rode a lot of bikes – maybe not a lot, but enough to know what the weaknesses were with the Paperboy-based bikes. And a good friend of mine, Craig Mitchell, was building his first fat-tire bike at about the same time out of Cromoly. He died about 20 years ago, and he fell off the radar. He is not in the Mountain Bike Hall of Fame. He was experimenting with some pretty neat ideas at the very beginning of all this. I had a chance to ride his fat-tire bikes and existing Klunkers. The wheelbases [of the Klunkers] were too long, the bottom brackets were too high, they were hideously flexible, especially the forks. The brakes were inadequate, and on and on.

JH: Well, they were not really based on a rational design.

CC: It was meant for something else really, and it wasn't designed for the job. One thing I picked up relatively quickly – with 18-inch chainstays, when you get out of the saddle to climb on relatively loose, steep terrain, the rear wheel just slips. I actually liked the handling characteristics of the Schwinn Excelsior, once you broke it into a slide. So I scaled the wheelbase and chainstay ratio of that bike down for my first bike. My first mountain bike had 17-inch chainstays and about a 41 ¾-inch wheelbase or thereabouts. I shortened the front to match, by steepening the head angle. So it handles well in a slide. It is well-balanced, when your weight is concentrated on the saddle and the bottom bracket. I think that is really important for a mountain bike. I lowered the bottom bracket to 11 ¾ inches, which after playing with different bikes, found to be the best height for the terrain I rode.

JH: When I measured Jacquie's bike, Otto, for our book The Competition Bicycle, *I found it to be rather different from most mountain bikes of the time.*

Photo: Arne Ryason

Charlie Cunningham on one of his bikes, around 1981.

CC: Most bikes at the time had pretty shallow angles, 68-degree head angle, long wheelbase, and probably around 2 inches [fork] offset.

JH: I only rode "Otto" around the photo studio, but I found it – or is it "him"? – easy to maneuver in tight spaces, with little wheel flop.

CC: Well, it's a pretty nice combination of head angle and fork offset. How I arrived at that, is an interesting story. When I built my first mountain bike, before I went out to Crested Butte, I did a bit of riding around here. I actually chopped up the frame and altered the angles a little bit before I was happy with it. I ended up with about a 70 or 70.5 degree head angle on that bike. After that, they typically were 71.

JH: I measured 71.5, but I am not confident that I got the half degree right, especially with that glued-on head badge that gets in the way. How much fork offset did you use?

CC: It's about 2 inches. Some of the bikes I built after that had a little less offset, but you can't go too low on an unsuspended mountain bike, because that offset does contribute a lot to the suspension. So I don't like to go below 1.8 inches of offset.

JH: So it has more of a road bike geometry?

CC: Yeah, it was a lot shorter than anything available. My stab at geometry was based on a lot of trial-and-error riding, but I never really had a chance to ride anything like what I finally built. It was pretty cerebral. It turned out really nice, and it only required minor refinements to really dial it in.

My bikes also had the steeply sloping top tube. It makes the frame lighter, it makes it stiffer torsionally and in bending, and it gives you more standover clearance. It has a ton of structural and ergonomic advantages. The only drawback is if you ride the bike in a cyclocross-type setting, you can't do the classic cyclocross carry, with the small front triangle. Heck, I don't carry mountain bikes that way anyhow. It worked out really well. The big-diameter seatposts were very unusual. As far as I know, nobody was doing it. It is difficult to do a large-diameter seat tube like that, especially out of aluminum, and not have the frame distort wildly during welding. I came up with a way to make it perfectly round and accurately sized for the seatpost. This allows you to make a pretty long, thin, high-grade aluminum seatpost that has pretty good flexing qualities. It absorbs shock really well, and we got a stiff bottom bracket out of the deal.

JH: Tell me about frame stiffness. In our double-blind tests,[1] we rode faster on the lightest tubing and the most flexible bikes. And very few professional racers rode on heavy, stiff "Super Tourist" tubesets. So is stiffer really better?

CC: I think there are different kinds of tubes for radically different applications. I think that for most of the types of riding that you do, [a more flexible] bicycle probably would be way better, but I think that people who race bikes tend to be fairly strong. Usually in racing, you have to put out a lot of power in bursts, sometimes for sustained periods.

JH: We found that the more flexible bikes worked better especially in short bursts of acceleration. While we aren't racers, we ride pretty hard. And consider all the pros who won races on super-thinwall Reynolds 753 bikes.

CC: Well, I do think there are energy losses if there is too much flex in the frame. I know that is a debatable subject, but from experience, certainly in an off-road setting, that seems to be the case. You don't want the frame to be too stiff in the vertical plane, but you definitely want maximum torsional stiffness, certainly off-road, for handling, because the wheels are big gyroscopes. When you are moving at higher speeds on a mountain bike, when you try to change your direction, those gyroscopes put pretty significant loads on the fork, the fork blades and the frame. If the fork and the frame are not torsionally stiff, you get a thing called "auto-steer." I didn't like that about those first mountain bikes, the Klunkers. They had really heavy wheels, and if you tried to steer really quickly, I wouldn't say they went into shimmy, but you get these resonances in the fork that really detracted from your handling. And then, when you put the front brake on, the thing would waggle back and forth and disrupt traction and control.

JH: Your bikes had straight fork blades. How does it work for traction if you don't keep the front wheel on the ground?

CC: Well, that is an interesting story. The available forks were really inadequate. I wanted to make my own. Conceptually, I thought that the best fork would be what is now called a Unicrown fork. A 1-inch diameter tube, make a bend in it, and taper it.

JH: Why would that be better?

CC: For one thing, the classic forks for road bikes and cyclocross bikes used an investment-cast crown with oval blades. The available oval blades were very poor in torsion. If you take a classic touring bike or even a road bike from that vintage, and place the front wheel between your legs, pinch it, and

Photos: Jean-Pierre Pradères

Jacquie Phelan's bike "Otto," clockwise from above:

1 Sloping top tube, oversize aluminum construction.

2 Modified derailleur with added spring.

3 Roller Cam brakes and steel fork made from 1"-diameter top tubes.

4 Custom stem and Grease Guard headset.

take the handlebars and move them with your hands, they really move quite a bit. So this one-piece round blade is what I thought would be the best-possible design for a mountain bike, which has much heavier wheels than a road bike.

JH: That is an interesting idea. I have ridden many older cyclotouring bikes. While the 650B x 42 mm wheels aren't as heavy as mountain bike wheels, their diameter is larger, so the gyroscopic forces must be similar. Yet there is no problem with "auto-steer" or other issues resulting from lacking torsional rigidity, even on bikes with very lightweight frames and oval fork blades. Could the handling problems of the early mountain bikes be due to unsuitable front-end geometries, rather than a lack of torsional stiffness? I talked to Peter Weigle recently, whose mountain bikes used similar geometries to yours, but traditional materials, and he found no problems with auto-steer or gyroscopic forces of the wheels. Perhaps the early Klunkers' problem was more a matter of geometry rather than lack of torsional stiffness?

CC: Well, I don't know about the terrain or how demanding Peter was in his tests, but in my early bike evaluations, I definitely experienced the rotating mass of the wheel contributing to significant handling and control issues. I think most of the problem

was the flimsy oval fork blades, but the flexy frames contributed, too. Maybe the front-end geometry was lacking as well. I liked the handling on my 'cross bike, so I decided to use a steeper-than-the-norm head angle on my first mountain bike. The 2" fork offset I chose worked out in testing to be a nice combination.

Anyhow, to make a unicrown fork, I got quotes on getting round straight-gauge tubing swaged, so it would taper and bend. It was way too expensive. I did a full-scale drawing for Gary Fisher, when he asked me what I thought the ideal fork would be. He took the drawing to Tange and had them made and left me out of the picture. It doesn't bother me, because I liked the forks I ended up making better. I built my first fork with Ishiwata heavy-gauge top tubes, one inch diameter OD. I think [the wall thickness] is about 1.1 or 1.2 mm in the thickest portion, and then it is butted down to about 0.8 mm in the thinnest portion. All my Type II forks are made with a combination of TIG welding, low-fuming bronze brazing and silver brazing to get the best end result depending on the type of joint being put together. I made the fork crown out of 1.125 x .058" Cromoly 4130 tubing. I was astonished how well it worked and how light it was. The fork weighs about 1.5 pounds. It has incredible torsional stiffness and very good stiffness when you put the brakes on. Curiously, and I cannot totally explain this, but possibly because the wall thickness is so thin, and the diameter is so large, these forks have amazingly good high-frequency shock absorption compared to a heavier-gauge, smaller-diameter blade. Nothing like suspension, but a lot better than any fork I had ridden before. So I totally abandoned the idea of a unicrown fork. I drew up a curved crown. I got some tubing, had it bent to a pretty tight radius, and made my crowns out of those. They are stiff forks, but they are not bad for shock absorption. Fat tires at the right pressure are pretty good at absorbing the medium-frequency, medium-amplitude stuff and your body, if you are riding right, your legs and arms soak up the low-frequency, big amplitude stuff. The blades, with thin [walls] and a large diameter, are pretty good at taking care of the high-frequency, small amplitude hits. Same thing with the big diameter, thin, long seatpost.

The first brake on that bike, the Toggle Brake, is an extraordinary brake. It works incredibly well, but it is way too sophisticated to sell to the general public and expect them to use right and adjust properly. It took a huge amount of time to build those brakes.

JH: Can you describe briefly how they work?

CC: They are similar to the Roller Cam on Jacquie's bike. In fact, the way the brake arms are mounted is pretty much identical, except there are Zerk fittings for grease. Two linkage arms connect and pivot in the center and the outer tips connect and pivot on the brake arms. You have a piece of cable housing that comes down to where the linkage arms join. The cable goes down and attaches to the frame or the fork.

JH: So it is a little bit similar to a Campagnolo Delta brake? Terrot made a brake like that in the 1940s.

CC: Yeah. It has a coiled spring, which is a weakness. As I learned, [the coil spring] is not self-centering. You had to center that brake by making sure that you clamped the cable at just the right angle. That problem, especially when it got muddy, caused me to develop the linear spring, which does self-center. That brake was really good. The most important thing about that brake is not the linkage, but it is the way the arms are mounted. The pivot is mounted much closer to the ends of the tubes - seatstays, chainstays, fork blades...

JH: Like a centerpull brake...

CC: Yeah, and the brake surface is not cantilevered off the tube. There is way less flex in the system. That allows you to put a powerful linkage on the brake. There are a lot of brakes out there right now that have powerful linkages, but they are really poor when it comes to control...

JH: Like V-Brakes?

Photos: Charlie Cunningham

CC: Yeah, that is a good example. They flex like crazy, and they load up like springs, and it is really difficult to get accurate control with a brake like that.

JH: The same problem occurs with a long-reach sidepull or dual pivot brake, where the long arms flex even more than the fork blades or seatstays on cantilever brakes...

CC: Yeah, it does.

JH: Back when you developed the Roller Cam brakes, you probably were not aware of a lot of things the French makers were doing 80 years ago. Your Roller Cam brake resembles a 1920s Jeay brake. They were running big, fat tires on their 650B wheels.

CC: I was totally unaware of that. I didn't find out about the Jeay brake until I applied for a patent, and it came up. That was all new to me.

JH: So was the patent granted anyway?

CC: Yes, but it was quite limited. Basically, if someone didn't copy my exact version of the brake, it probably would be OK. All the Jeay brake had in similarity was that it had a cam. Just from looking at it, it was way too flimsy to be much use on a mountain bike.

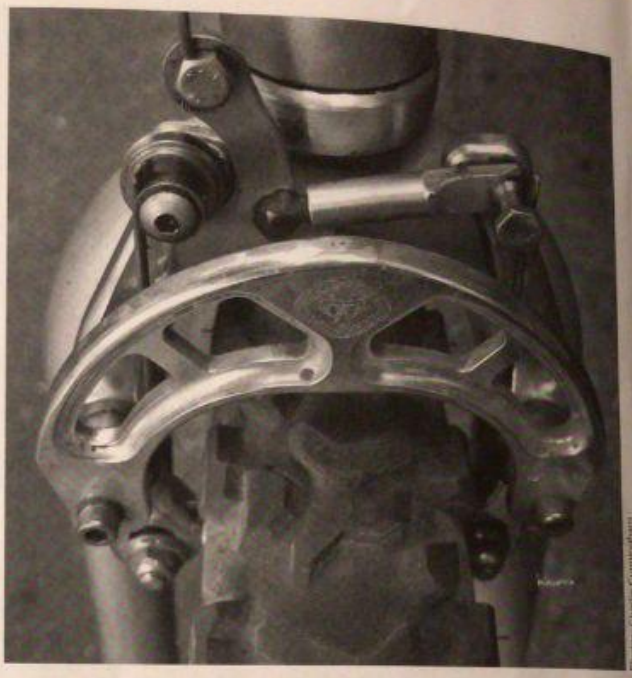
JH: Yes, it was intended for road bikes. However, some French constructeurs used Jeay brakes on tandems as well, in preference to cantilevers.

CC: The cam linkage was where I started with brakes for sale. It was a simple way to get a powerful, tunable linkage, but not quite as ridiculously labor-intensive and hard to set up as other designs. It had some weaknesses, and I don't use them on any of my personal bikes anymore. But it had its place in history, and I did patent it and licensed it to Suntour. The royalties pretty much paid for my house. I am not complaining.

JH: Did Suntour not know that they could have changed it ever so slightly to get around your patent?

CC: When you license something, you are buying more than just the rights to do it. You are buying the demand that already has been created. I was getting far more demand than I could do on my own. The brake was appearing on top-end bikes at the time. Suntour also were buying my expertise. As it turned out, we ran into a bit of a problem there. The owner of Suntour, Junzo Kawai, and I were good friends. We totally spoke each other's language and were fans of each other and [of] mountain bikes. He was the guy who made the license happen, but their chief engineer, who did not ride mountain bikes, not even bicycles at all, did not like the idea of licensing outside technology. So from Day One, it was hard to do the brake in the best possible way. The brake has since evolved, the linkage has evolved, and what I

The Toggle Brake attaches the end of the brake cable to the fork. Squeezing the brake lever moves the cable housing stop down and spreads the linkage apart. All parts are handmade. The coil spring does not self-center, so the brake cable is clamped at an angle to center the brake.



Photos: Charlie Cunningham

The Roller Cam brake (see p. 41) became the Toggle Cam (shown here). Instead of two cams, one for each brake arm, there is only one, with a profile twice as steep (top left). A simple link transmits the brake force to the other brake arm. The lever has a screw adjustment, making it easy to adjust for pad wear: "You just pop the linkage out from between the brake arms, and you unscrew the yoke with your fingers." Linear springs (bottom left) provide excellent self-centering.

really like now is the Toggle Cam. It is a cam on one side, and it pivots on the other side off a pin. This linkage has much lower friction and is much less prone to mud-fouling.

JH: How do you operate the other arm?

CC: The cable attaches to the cam end of the arm and the yoke on the other end pivots on the other arm. With the linear spring it centers fine. This linkage is nice because it is really easy to adjust for pad wear. You don't even need tools, you just pop the linkage out from between the brake arms, and you unscrew the yoke with your fingers. You can adjust for the pad wear without changing the mechanical advantage. It is very simple to use, and it has very good performance characteristics.

But the very best linkage is what I call the Lever Link. It is a little more difficult to make, but it is not only adjustable without tools for pad wear, but you can also adjust its mechanical advantage without tools in a matter of seconds. It's not that I am doing that very much, but I find that I do it twice a year. When the rainy season comes, I need more pressure, and I increase the mechanical advantage. When the season dries out, I back off the mechanical advantage. It is kind of the pinnacle of the evolution of that brake. That linkage came along at the same time [when] disc brakes started to make their appearance. It became apparent that high-end rim brakes were no longer commercially viable.

JH: What do you think of disc brakes?

CC: They are getting pretty good. They always have been pretty darn powerful, but the problem with the early ones has been that

they were very hard to modulate accurately.

JH: Are you talking about hydraulic or mechanical discs?

CC: Well, both. A good hydraulic is better than a good mechanical in that regard. Even the best ones I have used don't approach the excellence of a really nice Lever Link brake in dry conditions. In wet conditions, the disc brakes have obvious advantages. In effect, a rim brake is a disc brake, it just has a big disc, and it has an aluminum rim on a rubber pad that contains abrasives. The rim abrades, so it leaves a constantly uniform surface. With the relatively lower pad pressures, it gives better control accuracy. A lot of people don't care about that on modern mountain bikes. They have huge tires and lots of suspension, and they are going at warp speed over boulders and all kinds of stuff. In those conditions, you don't need that kind of sensitive control.

JH: Where do you like to ride?

CC: My favorite riding is really narrow single track, often on a slope, and sometimes pretty technical. There, you really have to control those two contact patches quite accurately at relatively low speeds. Disc brakes are still not at the point where they can do this as well as the best rim brakes.

JH: On the road, not only the absolute brake power is important, but also the modulation, when you have to brake in mid-corner...

CC: ... or on a patch of gravel. I like disc brakes. If I were doing a lot of wet riding, I might use them. But for the kind of riding that I do, my rim brakes are still the best.

JH: Tell us about the famous Grease Guard System? People have put grease nipples on bike parts before. How is your system different?

CC: Yeah, it's been done for years on bikes, but the Grease Guard system minimizes rotating friction and the weight of grease that you carry. Maybe most importantly, it allows you to selectively grease and purge the bearings. If you just fill up the cavity between the bearings with grease, as it is done on cars and other equipment, there is more friction from grease shear, and the new grease will push old grease out through the bearings, but not in a very controlled way. It will take the path of least resistance, and that sometimes is not where the contamination is, if you have been riding in mud or rain. The Grease Guard design has a patented seal design. The seal contacts the inner race of the bearing in such a way that there is very little grease behind the bearing. When you pour grease into that cavity behind the bearing, it pushes the old grease out through all the balls, 360 degrees. So you get a nice, uniform purge through the whole bearing. It is amazingly effective. You go for a muddy ride, and then you just put your grease gun on, and you see this dirty, muddy grease coming out, and then nice clean grease, 360 degrees around the bearing. You just have rebuilt

Photo: Charlie Cunningham

The Lever Link brake allows adjusting the mechanical advantage. During the wet season, the left arm is shortened, so the brake arms travel less for the same cable pull, but have greater power. During the dry season, the left arm is lengthened, moving the pads further from the rim, but offering less brake power. All Cunningham brakes attach close to the fork crown, like centerpull brakes.

your bearings in about 30 seconds.

I don't think it ever was a commercial success. Most people just don't demand parts that last that long or are maintainable. They do want parts that work well. But most of the stuff I see out there today is not really intended to last that long. In fact, the manufacturers intended it to be replaced every few years with a newer product. They don't even maintain stock after a few years, even if the product is good and popular, because they want you to buy new stuff. We did [the Grease Guard] for a while, but it never really caught on. Another problem, I learned from experience... Some people, personality-wise, are really keen on maintaining their bike, and making things last. And some people just do not care. They much rather would wear the thing out and throw it out or take it to the shop and pay to have it fixed. That really bothers me. I like to use materials efficiently and respectfully, and not waste anything. I like the idea of something that works super-well, and that is really maintainable and intended for a long life.

JH: You stress the ability to purge the contaminated grease. What about just sealing the bearing to avoid contamination in the first place?

CC: It is almost impossible to seal a hub. With hubs, bottom brackets, pedals and headsets, there typically is a fair amount of air between the two bearings. When you hit a cold puddle, you chill that metal and the air inside the cavity, causing a partial vacuum. It literally sucks the muddy water into the bearings. There are ways to fight that, but if you are riding on a hot summer day, and you go through a stream, it's pretty hard to keep that water from getting into the bearings.

JH: You mean during complete submersion?

CC: That's the worst case, but even just having water on the bearing seals while they are rotating is all it takes.

JH: The people making generator hubs face that problem. Schmidt puts a pressure compensation system in their SON hubs, with a long hose coiled up inside. All the air and moisture that enters, goes into that hose. When the hub gets warm again, the moisture gets pushed back out.

Photo: J. Heine

Modern Shimano hub, with large barrel and thin (standard) axle, has great air volume inside. When the hub is cooled, the air inside contracts, sucking in moisture.

CC: Wow, so water never goes all the way in.

JH: What about the Shimano "Parallax" hubs with the extra-large bodies and a standard, small axle? That should be the worst...

CC: I do not think they are aware of that problem. I put that in some literature once, and I saw people going: "Oh..." For years and years, the manufacturers were watching the technical literature I was writing for my WTB info packs. It was so funny. We would alert people to certain issues, and next year, all these products would appear [that addressed the same issues]. It was hilarious, how closely [the big component makers] watched us.

JH: I don't think they do that any longer...

CC: They don't care any more. Today, what matters is who has the cheapest manufacturing and the best marketing and distribution, it doesn't have to do a lot with the parts themselves.

JH: Let's talk about that. I see a lot of questionable progress. Carbon-fiber derailleurs which aren't any lighter than aluminum derailleurs. Hollow carbon-fiber spokes that have huge air resistance. What do you think of all that?

CC: I am frustrated, as an engineer – I studied engineering at UC Berkeley – and as a person who cares about using resources in a responsible way. The paradigm that has been adopted throughout our society has been more features, forget about the stuff you have and get the new stuff. The bike indus-

try, as it has matured... They have to sell new stuff. How do you do that? You add features and you add materials, and if you can put a story behind it and make people think that it is better... A lot of people buying that stuff don't think about it much, perhaps they are not technically sophisticated, and they buy [the ad copy] hook, line and sinker.

Mike Sinyard [owner of Specialized] had his annual get-together for the press last summer at Tamarancho here in Fairfax, and Jacquie ran into their group. He invited her and me to join them, and he came to my shop. He was very generous and later sent me a lot of product. I analyzed it, modified some of it, and then wrote him a long report about what I thought of it and how to improve it. He didn't even acknowledge that he had received my letter.

JH: What kind of improvements did you suggest?

CC: For example, the spacing of the dropouts has remained the same for almost a quarter century. Today, with ever more cogs on the rear, and disc brakes on the front, you get dishing issues, and the angle of the spokes is not very good. For mountain bikes, I can see going to 125 or 130 mm on the front. [Current practice is 100 mm.] And on the back, I think 145 mm would not be unreasonable for cross-country use. [Current mountain bikes have 135 mm.] For downhill, maybe even bigger. I think it would be nice to get some spoke bracing back in there.

JH: French tandems used 110 mm on the front and 135 mm on the rear... Jacquie's bike has drop handlebars. Was that her choice or yours?

CC: I think it was me. My first mountain bike had drop bars. They use your body more efficiently ergonomically than a flat bar. They have quite a low position on the drops for climbing. My bikes have a relatively short wheelbase, and I can get into that really low position and maintain good traction. I also have long arms, and so it works well for me. [Drop bars] absorb shock really well. If you stretched them out, they would be quite long. They absorb shock better than a traditional flat steel bar. I use them on most of my personal bikes. I used Cinelli bars, I can't remember the model, and I modified them a little bit, so they were a bit wider and provided a better grip angle in the drops. Then I had some handlebars specially made by Nitto. Drop bars were completely contradictory to the image that the manufacturers wanted to project for mountain bikes in those days. [Mountain bikes] were supposed to be fun and easy and very different than the traditional "uncomfortable" riding position on a [road] bicycle. The manufacturers weren't keen on [drop bars]. At least in the racing scene back then, you saw a fair amount of them. A lot of the riders I sponsored rode drop bars and did really well.

JH: In cyclocross, everybody uses drop bars off-pavement.

CC: Yeah, it works fine. Some of my early bikes had a pretty low position on the drops. As I get older, after 3 or 4 hours of technical riding, my lower back gets pretty tired, so I am using the drops less today than I used to.

JH: Did you modify your derailleurs? On Jacquie's "Otto," I noticed a little spring.

CC: Pretty much all the derailleurs that I put on personal bikes have been pretty heavily modified. I used a wide-ratio freewheel in the back, often with custom ratios. The bike in the museum started out as a 13-32, and it ended up with an 11-38 seven-speed. You could actually run that sort of range with a short-arm derailleur, if you modified it in certain ways. A short-arm derailleur has obvious advantages for controlling the chain. That is part of what I am doing when I add that spring. I alter the angle at which the cage sits. The freewheels are pretty heavily modified. Even from the earliest days, I was brazing cogs together when necessary, and taking cogs that weren't supposed to fit and making them fit, being really picky about the gear jumps between each gear to the next, reprofiling the teeth for better shifting...

JH: How do you reprofile the teeth?

CC: It's a pretty detailed process. The pitch of the cogs is unaffected. There are certain

ways you can sharpen the backs of the teeth to get the chain to drop on easier. You can create gates by cutting the tops off some teeth. You can cut angles and shape the peaks of the teeth so the chain drops in better. I just sat down and very carefully analyzed how the chain is engaging the teeth when you shift up or down. I removed metal where it did not need to be, to make that process smoother. Boy, they shift significantly better than they do off the shelf, but it is a lot of work, like everything I do. It seems like it's ridiculously labor-intensive.

JH: You've never thought about making a complete derailleur from scratch?

CC: No, I have been kind of pragmatic about that sort of stuff. They are really complicated pieces. I could probably make one or two in my shop, but to manufacture something like that, there are a lot of tooling charges involved. A lot of people are already doing it. I found it far easier to pick the best of the existing derailleurs and modify it and make it close to perfect. I got really good function out of it with minimal effort.

JH: What are you doing these days?

CC: A variety of things. For earning-a-living type stuff, I have been building a lot of electric bicycles lately, for a friend of mine. He is involved in the cutting-edge of battery and motor development. I have been happy to fabricate these things for him. Then there is a fair amount of Cunningham work. It seems that since we have created the web site, more and more people, who own Cunningham bikes, have been getting in touch for restorations and such.

JH: But no new Cunninghams any more?

CC: There is an interesting project in the works with Steve Potts. It is a really limited edition bicycle. Steve will build the frame, and I will be making some of the parts that you cannot get any more. I'm providing Steve with really rare fork blades and crowns, and I'm making the brakes, seatposts and some other bits and pieces. Beyond that, I am kind of available at a shop rate, and if people need me to do things, I can fabricate or design for them. One of the more interesting jobs I have had recently is a guy who develops thermo-electric modules, which convert heat into electricity. He is designing them for aircraft exhaust systems to reclaim some of that wasted heat. Aside from that, I am maintaining two homes and constantly improving my shop, all of which keeps me busy. It's all in good balance, and I'm really happy.

JH: Where do you see bicycles going from here?

CC: It's fairly hard to predict. It will track other industries, as it matures, the skiing industry, the golfing industry. But there is a difference. There are a lot of very organic, earth-oriented people who are involved in bikes. There will always be a place for bikes that are relatively simple, efficient and long-lasting.

JH: It is interesting to me that the bikes we ride have morphed into what the mountain bike promised – the fun of a road bike with the versatility of the wide tires and the ability to go anywhere... This type of bike doesn't exist any more in the mainstream, except perhaps in a cyclocross bike. The people who are trying to revive the old spirit often overlook the fun, the speed part of the equation, by going all the way back to the Klunkers, or so it appears. I see the need for the lightweight, fat-tired road bike, whether it is made from carbon, aluminum or lightweight steel.

CC: It's ironic that you say that, because I agree with you 100%. These Pottinghams, this sort of secret project Steve and I are doing, fall very squarely into that category. I think you are pretty right-on on that.

JH: I like to call it the "Allroad" bike, because it can go fast on any road, paved or not.

CC: I have a bike like that. It's ostensibly a cyclocross bike, but it has pretty fat, smooth tires on it, the 35 mm Expedition tires. It has a larger-diameter 27" front wheel and a 700C rear. It's wonderfully efficient on pavement, but you can take it anywhere you can take a mountain bike and cover that terrain

darn efficiently. It's the bike on which I put the most miles.

JH: I think there is a great future for bicycles. Sometimes, I get a bit discouraged when the newest and greatest is adding a cog to the cassette to make it 11.

CC: In settings like road racing, where you ride in a pack, and you need to operate your body at the ideal cadence, and if the attack isn't going at the right speed for the gears you are in, you need more gears to match your cadence to the speed.

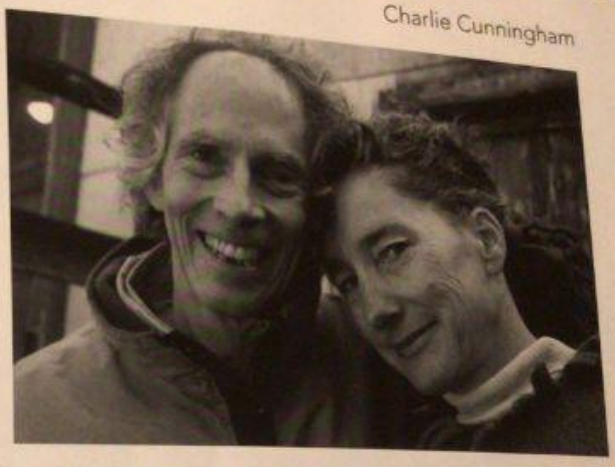
JH: Or you go to the front and set the pace...

CC: Right on. For mountain bikes, more cogs is a terrible idea. In tension, the narrow chains may be just as strong, but they have far less wear surface than they used to. They wear out really fast. They also are more temperamental and break easier when shifting. Frankly, on a mountain bike, in the terrain I ride, I don't want to shift that often. There is no need to. Like those racing motorcycles of the 1970s, [where] the power band of the engine was a few hundred rpm... They had a huge number of gears, and you were constantly shifting. Modern bicycles have real limitations in terms of rideability, because there is too much shifting going on.

As I consider myself a cross-country rider, I would like to see somebody apply half the intensity and design evolution to the type of suspension that is really needed for efficient cross-country riding. The public has been sold on the idea that more [suspension] travel always is better, and man, it definitely is not when you try to do efficient cross-country riding. I think there is a place for suspension on a mountain bike, but I would like it to be simple and relatively short-travel, and quite sophisticated in its reaction to shock and the body standing or sitting. And it has to be maintainable and long-lasting. Nobody is even going near that, everybody says more [travel] is better. It is so unrealistic compared to how people use mountain bikes.

JH: What about suspension built into the frame, without any pivots and shocks?

Charlie Cunningham



Charlie Cunningham and Jacquie Phelan today.

CC: Yeah, I don't have a huge amount of experience with that. Jeff Jones stayed here for a few days, and I had a chance to use some of his bikes. I was really impressed. If you are reasonably fit and skilled person, your legs and your arms provide a huge amount of the low-frequency, high-amplitude shock absorption. And the fat tires, if you don't run rock-hard pressures, can take a lot of the mid-frequency, medium-amplitude stuff. Where suspension is most helpful on cross country mountain bikes, designed for maximum efficiency, is for high-frequency, small-amplitude stuff.

JH: But that is where most modern suspension does not work at all because it has too much stiction!

CC: I know! It is designed for warp speed and big hits.

JH: You can go around that rock if you have a bike that handles well.

CC: Exactly! And you'll spend less energy doing it.

JH: Thank you, Charlie, for the interview. I look forward to hearing about your future projects.

The Cunningham web site is currently being reworked. It will be at www.cunninghambikes.com.

1 Heine, J., M. Vande Kamp, A. Wetmore and H. Rossman, 2008: Frame Stiffness Matters. *BQ* Vol. 6, No. 4, p. 44.