

A meeting *of minds*

"There's only one thing
worse than descending
on a carbon bike —
that's climbing without one"

Greg LeMond

In 1991, **Greg LeMond** was searching for a bike fast enough to keep him at the very pinnacle of professional bike racing. **Craig Calfee** was busy forging a quiet revolution in carbon construction. Together they changed the face of cycling

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It's 1991 and Greg LeMond should be on top of the world. He's at the peak of his career, confident and has a team built around him and ready to serve his every demand. He's won the last two editions of the Tour de France and just two seasons before had taken the rainbow jersey of world champion in Chambéry.

He has every reason to think he can win a fourth Tour: arch-rival Bernard Hinault is long retired, Laurent Fignon hasn't been the same since coming second to him in 1989, and Miguel Indurain is still an unknown factor as a real GC contender.

On the other hand, there are complications and warnings. He still has 37 shotgun pellets in his body; two in the lining around his heart. His body is sending him confusing signals he can't quite decode. He's also begun to notice something ominous in the peloton: "The races were just getting faster and faster. I didn't realise what was happening."

But more straightforwardly, he needs a bike. He's interested in carbon-fibre, even though the technology is still in its infancy for bike frames. Carbon-fibre bikes are relatively common, it's just that LeMond wants a better one. Preferably the best one.

Setting sail

Backtrack a few years to 1987 and watch Craig Calfee stumble into his life's work. Just out of the Pratt Institute in New York with a degree in sculpture, he's scraping by on minimum wage as a carpenter in Boston when he sees a job opening at a boat-building company.

In his imagination, he pictures beautiful curve-linear pieces of wood but soon discovers these boats are carbon-fibre racing shells bound for the Olympic Games. The workplace is thick with the stink of epoxy and he's hooked — Calfee suddenly has a new career at

the intersection of carbon technology and practical application.

Greg LeMond wasn't going to try and win the Tour de France paddling a scull up the Alps or Pyrenees. The transformation from boat to bike would require an act of fate — in this case, an errant Pontiac Firebird. Racing downhill at 60kph on an old steel Schwinn Varsity, Calfee is hit head-on by a Firebird running a red light.

Miraculously, he walks away with barely a scrape but the Schwinn is destroyed. He already knows the incredible attributes of carbon — its combination of strength, stiffness and lightness. An empty bank account inspires him in his first efforts to build carbon bike.

"I made my own fibre on a braider. It made tubular fabric and then I'd slide that over a mandrel. It's basically the same technology being used today," says Calfee. "Besides the frame, that was the first all-carbon fork and stem ever made."

The finished frame was ugly, misshapen and barely aligned, but the aesthetics and rough handiwork meant nothing. As a concept, as an engineering feat, it was the future. The promise and implications were eye-popping.

Calfee didn't know it at the time but he'd just traded the Olympics for the Tour de France. He was about to become Greg LeMond's carbon guru. The long-haired 28-year-old punk left Boston to start his own bike company in San Francisco. Calfee worked days as a carpenter, to make ends meet, and cured epoxy at night.

"It was survival mode. At the time I had three or four employees. We were making two frames a week, if that," says Calfee. "We were in a garage alley with a meth clinic down the street. There were heroin addicts hanging around so I got a pitbull to guard the front door." **»»**

Slowly word got out about the beautiful frames, the paradigm shock of the strength-to-weight ratio. Carbon was an unknown, an exotic; if steel was 'real' then carbon was surreal, a freak material that geek engineers tinkered with as a hobby. In the conservative world of cycling, few wanted to race on a carbon bike. To put that in perspective, imagine trying to convince Andy Schleck to race on a bike made of bamboo — an irony because these days Calfee is a pioneer in bamboo bikes.

LeMond already knew those carbon horror stories. His Z team were uneasy about their TVT carbon bikes. People made fun of the 'plastic' frames. However, LeMond didn't doubt the material — he'd won his first Tour on a Look carbon frame — he simply thought the engineering and execution needed tweaking.

The TVT bikes used carbon tubes joined with aluminium lugs. As Calfee later explained, those two materials dislike each other. They have wildly different coefficients of thermal expansion — as a structural joint, it's the wrong choice. Sort of like handcuffing Lance Armstrong to Floyd Landis and hoping things go well.

On top of that, the bikes suffered from galvanic corrosion — salty sweat from the riders fell onto the aluminum lugs causing corrosion on the surface and inside, breaking down the bonding agent. Nobody wants to risk becoming unglued at 80kph on a descent.

Big break

The big break is the Frenchman who walks down the alley past the drug addicts and into Calfee's small shop. JP Pascal had seen one of Calfee's carbon mountain bikes; he was also the head of Time USA, LeMond's pedal sponsor.

"What got his attention was that we could do custom frames," says Calfee.

"Do you know Greg LeMond is actively looking for a new carbon frame for his team?" he asked. I said no.

"I had watched the '89 Tour when Greg won by such a slight margin. We thought our frames would be suitable for the Tour de France but it was this



Top left The bike that Craig built: LeMond's Paris-Nice machine
Above Sign of quality; a champ's cockpit; DeVries would have something to say about that BB
Left Campagnolo Delta brakes still look like the future
Far left Team Z colour-fade finish is a psychedelic touch

unattainable dream," says Calfee, still amazed over 20 years later at the stroke of luck. "How could you get someone like Greg LeMond to ride your bike?"

A fax with LeMond's geometry specs comes through and in four days Calfee builds and ships a test frame to France. Calfee even knocks off the funky multi-colour Team Z paintjob.

"I remember thinking, this is kinda the big break staring me in the face. But I'm always calm in tense situations," says Calfee. "I was practical about the whole thing."

The way Calfee tells it, straight out of the box, LeMond was blown away.

"Without even riding it, he said, 'This is amazing.'"

The rest of the team says, "Hey, it looks great but it's way too light — it can't possibly be stiff enough." It's Greg LeMond versus a team of sceptics. A long distance call goes out and it sounds like this: "Hi, this is Greg LeMond. I really like your frames. How fast can we get 18 of them?"

For Calfee, it's a period of exhilaration, momentum, pressure and triumph. In one week he jets to France and stands at the top of the Col d'Eze outside Nice waiting for Greg LeMond, the best rider in the world, to test that carbon bike on the final Paris-Nice stage, an uphill 12km time trial.

The part-time carpenter is jet-lagged and nervous and it doesn't help his confidence that LeMond's personal mechanic, the famous Julian DeVries, who tuned bikes for Eddy Merckx, is giving him the silent treatment.

"Julian is kind of a gruff individual," remembers Calfee. "He doesn't suffer fools and wasn't sure about this carbon-fibre stuff. He was the master and I was this 28 year old and my hair's too long for his taste."

Greg jumps off the carbon bike, he's grinning, the bike is great, stiff and light,

climbs beautifully, but he isn't sold yet. "He looks me in the eye and says the real test is how it descends because 'all carbon bikes descend like shit!'" DeVries stays silent as LeMond decides to bomb the bike downhill into Nice.

LeMond flies down the mountain. "I'm waiting at the team truck and Julian is not speaking to me," Calfee recalls. "Greg wheels up, shakes my hand and says, 'Craig, this is the most amazing bike I've ever ridden. It descends like a demon.'"

LeMond heads for a shower and DeVries ends his cold war. "Craig, you really did something here because whatever Greg touches turns to gold," says DeVries. "If he likes it, you're gonna do well." After that the gruff Belgian and the scruffy punk from San Francisco were friends.

"Immediately impressed"

Over 20 years later, LeMond still has a memory of that bike and that day.

"I was immediately impressed," he says. "Any prototype, you're nervous about going downhill. This was super predictable. Without hesitation, that was the best bike I've ridden in my career."

Understanding LeMond's enthusiasm was a simple thing you could measure with a scale. Back then there was no UCI weight restriction on bike frames. Most steel race frames averaged four pounds but Calfee's sleek carbon model cut that by over 25 per cent. That wasn't just weight slashed, it was physical motivation and psychological edge.

Calfee quickly learned about the technological arms race at the Tour de France and the consequences if the weaponry was substandard. He remembers sitting in a hotel room when LeMond explained the harsh reality: "Let's say I'm riding a bike that's heavier than Indurain's bike. Assuming that we're in the same condition and we're climbing Alpe d'Huez — if Indurain is on a lighter bike and I know this, I'm going to give up. I won't push myself as hard. I need to have the best bike."

LeMond was ready to keep pushing on the next design, pumping Calfee

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with questions. Where can we cut weight? Can we do carbon bars?

"He had a lot of money at his disposal and he didn't care about cost," says Calfee. "It was just: 'I want to win the Tour again.'"

At one point, LeMond asked him if they could make the gussets more aerodynamic.

"I was about to say well, there's a lot of turbulent air down there where the cranks are spinning but I shut up," says Calfee, shaking his head. "I realised I'm about to argue with a guy who won the Tour de France by eight seconds. Greg's the one guy in the world you couldn't have that argument with."

LeMond was always a technically-minded individual — besides the aero bars, he was one of the first riders to jump on aero helmets, clipless pedals and heart-rate monitors. He knew that he'd stumbled on a master carbon fabricator and designer in Calfee.

"The guy was an out-of-box thinker.



Above LeMond's bike first proved its worth at Paris-Nice 1991

Left The patronage of a pro raised Calfee's profile
Below Craig's company is still in the frame when it comes to innovation



He was very smart, the way he thought about design. I knew enough about carbon-fibre to know he knew what he was talking about," LeMond says.

The Paris-Nice frame was a first take, a baseline setting; except for LeMond's geometry it was off-the-shelf stock. Calfee figured a demanding professional like LeMond would have plenty of personal requirements.

"I said, 'Greg, we can change the stiffness, re-orient the fibre — it's like a tailored suit. You tell me what you want. There was this pause, you could tell he was really thinking about it. Then he said, 'There's nothing I want different.' I'd developed the perfect bike for Greg LeMond. That was cool."

Into overdrive

LeMond now had the killer bike and the technological advantage — assuming that Calfee and his crew could deliver 18 frames and two spares on a fast track.

"I was pretty stoked but I was also feeling the weight of responsibility. I'd only been making carbon bikes for three years," said Calfee. "We worked around the clock. My bedroom was behind the shop so I slept while the epoxy cured."

"I really liked this blue pearl look — we called it sapphire. I showed it to Greg and he said, 'Oh, that's awesome. Let's go with that.'" Out went the multi-colour dayglo paintjob for an elegant blue that showed off the carbon weave — the bike not only weighed far less, it wasn't burdened by tacky graphics.

The final hurdle wasn't the tight production schedule but the deep distrust of everybody besides LeMond and DeVries. When the bikes were presented, the reaction was universal — too light and too untrustworthy.

That was until the Johan Lammerts Judgement. The big rider from the Netherlands was positive he'd destroy the flimsy bike — he delivered a heavily accented, "I will break it." LeMond insisted he ride it and Lammerts and the bike came back in one piece despite the impromptu torture test. Team Z headed to Lyon and the Grand Départ with some carbon bikes, while Calfee went home, threw a party with speed

metal music and drank some beer.

Shortly before the 1991 Tour, LeMond was as confident as he'd been in years: "I had a Vespa and I'd do 80 [kph behind it]. That year I was at 85. I told my wife, 'I'm going to win the Tour breathing through my nose.'"

Unfortunately, he didn't know the speed in France had also been raised. That Tour marked the terminal point in LeMond's career. There were six days in yellow but it soon became apparent there was little hope of winning or even making the podium. In the first time trial, a 73-kilometre test from Argentan to Alençon, LeMond received the initial shock. "I was flying that day and I was beat by eight seconds. That was a big blow. I was blown away."

Psychologically he was done before the race hit the Alps, where the final body blow was delivered.

"Tourmalet was the day I really wanted the bike. But when you blow like that, it doesn't matter how light the bike is," LeMond says. He limped into Paris in seventh place behind winner Miguel Indurain. He had a better race bike than Big Mig or Claudio Chiappucci but that carbon machine couldn't pull back 13 minutes all on its own.

Explanations for the dramatic drop in performance are still a debated. It was the 37 shotgun pellets, a heart problem, chronic fatigue, too many kilos, a disease of the muscle tissue.

The suspicious and cynical point to doping in the mid-1990s and wonder how much earlier the secret sauce went into effect. LeMond never finished another Tour and retired two years later.

To compound the loss, a year later LeMond's bike company also ran into difficulties. Calfee lost his licensing deal and had to scramble to buy back the intellectual property and equipment.

"I was disappointed. I thought with Greg's marketing power and our technical knowledge carbon-fibre would dominate the market. It was a lost opportunity," says Calfee.

"I said at the time: 'Every rider in the Tour will ride carbon-fibre bikes because if they don't, they won't be competitive'. Ten years later that was the case."



Above The original creation is back in Calfee's hands

New bamboo

The original Paris-Nice frame has been down a few roads and through a few hands but now it's leaned up against a wall in Calfee's shop. The heroin addicts in the alley have been replaced by a view of the Pacific Ocean a thousand metres away. The two-storey building just South of Santa Cruz hums with activity and Calfee, who just turned 50, is still a renaissance bike geek jumping from project to project with restless enthusiasm for the challenges thrown up by each new mission.

The back ceiling is hung with Calfee's bamboo bikes from Africa, the Bamboosero venture he launched in Ghana and Nigeria. Craftsmen are busy repairing carbon bikes made by every bike manufacturer in or out of existence. He's keen to show off his latest crazy idea: a motorcycle helicopter that looks like something straight out of a *Mad Max* movie.

But the star of the show is the bike that started it all. Calfee has tried to pull the Campagnolo bottom bracket out but can't — they need an old extractor tool that probably only Julian DeVries still has. The restoration project will have to wait for another time.

The surprise is that, as much as carbon-fibre technology has evolved, it's still just first steps. Hold up Calfee's entry-level Luna frame to the Team Z model and the resemblance is strong.

"Metalworking has been going on for 6,000 years. That's a huge amount of development for a craft," says Calfee. "Carbon-fibre tubing has been around since the early 50s. We've got some catching up to do — there's plenty of room for innovation."

LeMond never got his fourth Tour de France victory but things worked out just fine for Calfee.

"I walked away with an awesome story," says Calfee. "I got some new investors and kept going."

Calfee is still friends with LeMond and continues to build bikes for the former champion. The latest request is for a fast bike, lightweight and responsive — only in bamboo and this time around, a tandem.

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