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In Australia, where our two best sprinters are still clawing away the 10-second barrier, the leading coaches do not doubt Greene's chances.

"If he gets himself in shape and gets the conditions Montgomery had, I don't see why he can't," says Matt Shilington's coach Michael Khmel. "I don't believe in limitations," concurs Patrick Johnson's coach Esa Peltola.

Where the record will stop, neither Peltola nor Khmel is prepared to say. They agree only on two things: that man will never be able to run 100m in zero seconds; and the lower the record goes, the smaller the margin for improvement will become.

"It may take another year, it may take another 40 years to get under this time," Khmel says. "But it will definitely go under."

To the naked eye, elite 100m running appears to have reached a plateau. When Montgomery was a skinny 19-year-old, he ran an unoffical time of 9.96. It was deemed unofficial because someone put the wind gauge in the wrong position. Now aged 27 and nearing the peak of his career, he has run what he describes as the perfect race. An extra breath of wind in Paris and his record would not have stood.

His response time to the starter's gun was 0.104 seconds. A response time of 0.100 seconds would have been considered a false start. Montgomery guessed when the gun would go off and never looked back. It was his moment.

Deduct his best teenage time from his world record, and what does Montgomery have to show for eight years of training, competition, injury, pain, recovery, dedication to technique, strength and diet? An improvement of 0.18 seconds. The average blink of an eye takes 0.24 seconds.

'How fast can they run? I don't know. But I know they can run faster than they are running right now'
John Smith
Maurice Greene's sprint coach

There is another way of looking at sprinting, however: a perspective that breaks a 100m run down into smaller parts. When you look at sprinting this way, as the coaches do, it becomes clear that Montgomery's run was far from perfect and there is room for improvement. He won the race in the last 20m but he didn't run away from the rest of field. Rather, he simply didn't slow down as much.

To most of us, sprinting looks like a mad dash from start to finish. An explosion off the blocks and a furious, flat-out bolt to the line.

In reality, it is not until 60m into the race that the best sprinters reach their top speeds. In the case of a Greene or Montgomery, this is about 12m per second or 43.2km/h — a bit faster than an elephant and a bit slower than a domestic cat.

Sprinters can only hold this speed for 20m or so, after which they start slowing down. To illustrate the point, Peltola refers to a graph, plotted by the Australian Institute of Sport, of a 100m run by Johnson in June.

It shows he reached his top speed of about 11.6m per second somewhere between 60m and 70m and started slowing down well before the finish line. To break his personal best of 10.10 and the 10-second barrier, Johnson doesn't need to run much faster. His challenge is to get to his top speed quicker or hold it for longer.

"If you can go out fast but reserve 1 per cent of effort over the first 30m, that one per cent will benefit you in the last 20m," explains Peltola. "If you burn all your energy in the first 30, you will pay the price in the last 20."

"That is a big area where they can improve," agrees Smith. "There is a slight decrement of rhythm at the end of a race and once we solve that problem they are going to go into a whole other dimension and you will see some times that are unbelievable.

"When you look at 100m you see 10 seconds of fastness. When I look at 100m I look at levers that are moving. I look at 45 steps. I look at impulses on each step. You have to slow everything down so you can feel what is moving fast."

The mechanics of sprinting is complex. The crucial moment is the point just before each stride hits the ground. Although sprinters give the impression of pushing off the ground, their legs actually drive hard and backwards through the ground.

The key muscle groups used when a leg hits the ground are the gluteus and hamstrings, which pull the leg backwards and down. It is up to the quadriceps to absorb the shock and prevent the leg from collapsing.

When the leg is off the ground — the swinging leg, as it is called — it is the hip flexor, a relatively small muscle that attaches to the quadriceps and reaches over the hip, which provides forward momentum and balance.

When everything is working well, the foot of an elite sprinter should spend no longer than 0.08 to 0.09 seconds on the ground at any time.

"It is almost like a Zen of sprinting," Smith says. "Your body has to be in the right position to apply the right forces. That is not something you can learn in one day."

With extreme speed comes extreme punishment. Montgomery might have left Paris on top of the athletics world, but also with bruised feet, sore knees and tight hamstrings. Smith likens the impact of running a fast 100m to being in a car crash. It is not a matter of people learning to run faster, he says, but people being able to withstand speed better.

"People don't understand that when you take your body somewhere it has never been, it suffers whiplash. A lot of people can run fast. The key is, do you have the fitness level to survive it?

"The amount of energy you expend in that time is basically what it takes people eight hours in a normal job to do. Ten seconds might be like an eight-hour day. To run sub-9.8 is maybe like a 15-hour day in the army."

REPORT

Executive Appointments