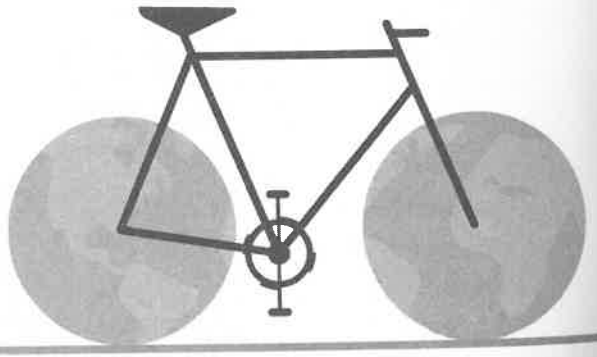

How Cycling Can Save the World

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A TarcherPerigee Book

INTRODUCTION

Not Everyone on a Bike Is a Cyclist

It was about ten thirty on a sunny Sunday morning, a couple of days before I sat down to write this, when the flotilla of cyclists came into view from around a corner. There must have been about thirty of them, riding more or less *every* sort of bike you could imagine. At the front, pedaling an ancient folding machine at a sedate, regal cadence, was a woman probably in her sixties, wearing red trousers and a bright blue visor to shield her eyes from the glare. As I watched from the pavement she gave me a grin in passing.

Behind her were men and women of various ages, a few dressed up in the default city cycling garb of luminous jacket and shiny helmet, but most in ordinary clothes, on very everyday bikes. I had no idea if they were some sort of unfathomable organized group, or whether the arbitrary actions of

traffic lights and chance had somehow coalesced them into this wonderful, accidental peloton.

But then thought struck me: either way, these people wouldn't have been here just a few months ago.

This was a road in central London called Lower Thames Street, which, as its name suggests, adjoins the river that flows through the city. An ancient thoroughfare—it was mentioned in the city's eleventh-century customs records—the road was widened and rebuilt in the 1960s, turned into the sort of double-lane urban freeway so popular in that era, when the dominance of the car appeared absolute and forever.

After the road was rebuilt for cars, very few cyclists would ride on it. It tended to be only the gung ho and bold who did so, almost all young men, often professional cycle messengers in a hurry, those who didn't mind holding a lane amid a stream of taxis and trucks, speeding under the bridges and along the concrete canyons. I was always a reasonably confident rider, but I'd try to avoid Lower Thames Street if I could. It just wasn't fun. The idea of a woman in her sixties choosing to cycle along it, even on a Sunday morning, would have been absurd. Such cyclists were excluded from large sections of their city.

So what changed? It was nothing more than a bike lane. In 2014, Lower Thames Street was selected as part of the route for one of London's first two modern, Dutch-style routes, boldly called Cycle Superhighways, which would protect riders from the motor traffic with continuous curbs, protected junctions, and bike-only traffic light sequences.

This was a controversial process. Businesses along the

way objected, saying the lanes would bring London to a halt. The trade group representing the city's iconic black cabs openly laughed at the idea that there were enough riders around to fill such broad bike thoroughfares. Outside of rush hour they would be unused, it predicted—a failure, a tumbleweed-strewn embarrassment.

In May 2015, the lanes opened, one running north to south and a longer route, taking in Lower Thames Street, heading east to west. And then the cyclists arrived. In a mass. My regular ride to work sees me ride along the north–south superhighway. I had begun cycling in London two decades before, when to do so made you something of a freak, an exception. At the time, other riders were so sufficiently rare that you'd sometimes nod in acknowledgment as you passed. Now, on the new, separated lane, I regularly wait at traffic lights amid a massed pack of two dozen or more cyclists.

For me, more interesting even than the numbers is the identity of some of these new riders. London's bike culture has long been dominated by speedy young men riding rapid bikes in specialized clothing, a product of the feral traffic culture and lack of dedicated provision for cyclists. But now other people are emerging on bikes: older, younger, slower, dressed in ordinary clothes, not riding lightweight racing bikes with ultraskinny tires.

This book is ultimately about everyday riders, and the astonishing and varied ways in which they can transform the urban environment and way of living for the better. It's about people like the sixtysomething woman with the visor and her motley gang of fellow riders.

In fact, you could even say this book isn't about cyclists at all. In one sense it is, of course. It describes the many wonderful and unexpected ways that lives and societies can improve if only more people decide they are happy to ride a bike. And if you ride a bike, you're cycling, and thus a cyclist. Correct?

Well, yes and no. In many places, particularly the UK, America, Australia, or anywhere else that the private car still dominates, if you tell someone, *I'm a cyclist*, they're likely to make a few instant assumptions. You're an enthusiast. An advocate, even. You ride everywhere, and make a vocal point of doing so. You might have opinions about gear ratios and a drawer full of garish, figure-hugging bike clothes.

I partly fall into that category. I have cycled regularly, and occasionally for long distances, for about twenty years. While I'm a news journalist I've also written quite a bit about cycling issues for my newspaper, *The Guardian*. I receive occasional bike-themed Christmas presents.

But I think the world needs fewer people like me, or perhaps more accurately it needs more bike riders like the crowd on Lower Thames Street, who treat cycling a whole lot less seriously. If cycling is indeed going to save the world, it won't be the Lycra-clad road warriors who'll be doing it. The big changes—and they can be huge—happen when a nation doesn't see cycling as a hobby, a sport, a mission, let alone a way of life. They happen when it becomes nothing more than a convenient, quick, cheap way of getting about, with the unintended bonus being the fact that you get some exercise in the process.

This is, sadly, not very common in the more car-centered nations. Cyclists are still generally viewed as a breed, a niche. They are also seen as a curiously homogenous mass. The moment I swing my legs over a crossbar, it appears, I'm a blob within a group. It doesn't matter that I also use cars, trains, buses, the Underground, my own two feet, occasionally taxis or planes, very occasionally trams, and very, very rarely the slightly eccentric and little-used cable car link over the River Thames in East London. For some reason it's only a bike that defines me.

Things are very different elsewhere. The Dutch and Danish—you'll be hearing a fair bit more about them in this book—tend to view cycling as little more than a particularly efficient form of walking. In such countries, bike riding is so ubiquitous, so normal, that almost no one defines themselves as a cyclist, any more than they might, say, define themselves as a wearer of coats or a person who takes showers.

For myself, as the years go on, while I still occasionally gaze longingly at shiny, expensive bikes in magazines, more of my actual cycling is along this continental European model. I now mainly ride clad in ordinary clothes on a solid, upright bike with a basket at the front and child seat (and sometimes a child) at the back. I make short trips to the shops, or work, or to a school. Gradually and gratifyingly, it seems, I'm becoming part of the solution.

This is important because the overwhelming evidence is that mass cycling, the sort where, say, 20 percent or even 30

percent of all trips in a country are made by bike, only happens when cycling becomes mainstream. That might seem self-evident, but it can't be stressed too much. This means you will never get very many people cycling when the bulk of riders are kitted out with helmets, Day-Glo jackets, helmet-mounted video cameras, and all the other high-tech accoutrements seen in less-bike-friendly nations. Cycling, dressed up as a hobby, let alone an extreme sport, will never attract more than a few percent of people to take part.

I delve into the mysterious and counterintuitive world of helmets and high-visibility gear later in the book. But it's worth immediately noting this: while they're not inherently bad, they're less a safety device for cycling than a symptom of a road network where no cyclist can truly feel safe.

So what is the answer? That leads us to the other big point. As Lower Thames Street (and countless other places) show, mass cycling needs decent infrastructure and planning. Everywhere with such cycling has a few things in common: notably, segregated lanes that shield riders with a physical barrier on busy roads, and lower traffic speeds on smaller routes. As soon as this happens, the bike helmets and fluorescent waistcoats suddenly disappear. They're not needed anymore.

Such systems need to be not just well designed and maintained but also cohesive, connected, and able to protect riders at perilous points like junctions. They must be secure and navigable for cyclists of all speeds and confidence, including

children and older people. They need planning, investment, and above all the political will to take space from motor vehicles—elements that can be all too rare.

One question remains, that which frames this book: *Why?* Why should car drivers, still the majority transport users in virtually all industrialized countries, make way for these anachronistic, bumbling, bell-tinkling, grease-trousered, wicker-basketed, two-wheeled interlopers?

I seek to explain all this in the coming chapters, but for now let's quickly imagine what would happen if I could press a magic button and transform my own country's derisory 2 percent or so statistic for the share of all journeys that are made using a bike[1] to a near-Dutch level of around 25 percent.[2]

In an instant it would mean that many millions of people in a chronically sedentary nation would make a large number of physically active journeys a year. I detail the ongoing public health disaster from inactivity in the first chapter, but even cautious back-of-the-envelope calculations from a 25 percent cycling share easily takes you to perhaps fifteen thousand lives saved every year in the UK alone.

That on its own would seem reason enough to summon the bulldozers and start building bike lanes. But there's also reduced smog and the accompanying benefits in combating climate change, many fewer families destroyed by the grief of road deaths, especially among vulnerable people like children and the elderly. You can even factor in a notable boost to overall mental health, and more vibrant local economies.

But most of all, after that magic button was pressed, you'd

suddenly find yourself among towns and cities that were suddenly more welcoming to human beings, rather than built for rapid, anonymous, one-ton metal boxes, often carrying a single person for a laughably short distance. This is absolutely not to say cars have no place in a cycle-centric imagined future, because of course they still will, even if they might end up being driverless ones. For now, however, they're used far too often and frequently for the wrong sort of trips.

In a world dominated instead by bikes, people can amble, children can play, fresh air can be breathed, conversations can be heard, all without our omniscient, noisy, smelly, lethal modern-day plague. If the woman in the visor had been driving along Lower Thames Street, chances are we could never have exchanged a smile. She would have been another impersonal head and shoulders glimpsed briefly through a windshield. Cyclists are recognizably human, traveling at human-scaled speeds. As a benefit to urban living, that can hardly be overstated.

So yes, cycling can save the world—or at the very least make it a significantly and noticeably more healthy, safe, equitable, and happy place.

And I'm not an environmental zealot, or a Luddite crank, someone who believes people should turn their backs on the modern world and embrace an antiquated technology. That's yet another paradox of the bicycle, and perhaps the most important one of all. For all that, its basic design hasn't fundamentally changed since its arrival in the late nineteenth century; the bike is almost uniquely suited to life in an increasingly urbanized modern world.

More than half the globe's population now lives in towns or cities,[3] many of which are clogged and choked by motor traffic. The bicycle can play a huge role in changing this, and in many cities is already beginning to do so. Amid the sometimes gloomy talk in upcoming chapters of public health disasters, smog-choked cities, and traffic casualties, real change is coming.

This is, above all, a story of hope.

CHAPTER 1

A Healthier World

I No Longer Trusted My Body

This book isn't a memoir. But it would never have been written without my own very personal experience of cycling, particularly the effect it had on my health. There's even a plausible argument that riding a bike saved my life. So before I describe how bikes could transform global health, allow me a brief personal detour.

It's not wholly unfair to say I was something of a runt as a child, scrawny to a degree that these days would possibly bring a family visit from a social worker. I was also affected by severe asthma, which emerged very early at age two, in the wake of a near-fatal bout of pneumonia.

As a child this never stopped me from playing sports. I was an enthusiastic if very obviously untalented footballer, but my efforts were generally sound-tracked by a slight wheeze and the voices of concerned adults asking if I should perhaps have a short break.

All this was nonetheless manageable until my late teens, when I experienced a spate of sudden and very acute bouts of breathlessness, not uncommon in asthmatics at that age. For me, these culminated in half a dozen or more trips to the emergency unit of my local hospital in suburban Cheshire, in the northwest of England. There I was swiftly injected with Aminofilin, a powerful and near-miraculous drug I only later learned can have occasional serious side effects, including heart complications. Suddenly able to breathe again, I would then spend several days begging doctors to be allowed to go home and be freed from a chest ward packed with coughing retirees smelling of tobacco.

More than once my breathlessness was sufficiently worrying for a doctor to sprint to the drugs cupboard. This is not a reassuring sight. Well more than one thousand people die from asthma every year in Britain.[1] It's far from inconceivable that I could have been among them.

As often happens with asthma, things improved gradually over time. My three years at college saw just one hospital stay. But by then I had lost confidence in my physicality. I stopped playing sports, rarely even broke into a run, and kept my spindly, ghostly pale legs wrapped in long trousers. I no longer trusted my body.

Fast-forward a few years to a large, shabby rented house in North London. Twenty-two-year-old me has pushed a chair into the middle of a bedroom and, clad in a T-shirt and a pair of extremely tight leggings, I am standing on it to examine myself full length in a large, wall-mounted mirror.

Before this vignette gets too alarming, let me explain. Three months earlier I'd suddenly given up a dull if secure graduate career to become a bicycle courier, or messenger. This was something of a surprise to friends and family, especially those who knew I'd not ridden a bike, or even done anything noticeably physical, for quite a few years.

It's hard to explain my motivation. I'm not sure even I knew at the time. An element was possibly to present myself with an inescapable daily physical challenge. "You feel let down by your body?" went the half-heard internal voice. "Now you're relying on it to pay the rent."

These days courier fashion is a staple in style magazines—the tattoos, the single rolled-up trouser cuff, the fixed-gear bike. But this was an era when the trade was generally populated by misfits, by greasy-fingered, unsocialized types who got anxious if they had to stay indoors for more than ten minutes.

Even amid this world of slight oddballs, I stood out, mainly because, knowing next to nothing about cycling, I had kitted myself with an absurdly impractical and clunky mountain bike, weighing about as much as a small moped. I rode this around London dressed in a combination of my own clothes and those borrowed from my then-girlfriend, wrapped in ever-thicker layers—I'd compounded my rashness by beginning this new, outdoor career in autumn.

The mechanics of the courier trade are fascinating. It is simultaneously a deeply exploitative industry and one where, at least in that largely pre-e-mail era, the paid-by-the-delivery earnings could be extremely high. Before long these were sufficient to pay off my student debts, a process helped by my

being too exhausted to spend money on much else beyond the industrial-sized sacks of pasta on which I subsisted. More relevant is that after a few months pedaling my behemoth of a bike for about sixty miles a day, the effect was starting to show, even on a milquetoast like me.

This brings us back to the North London bedroom. A couple of days beforehand I had begun insulating my legs from the winter chill with a pair of my girlfriend's thick cotton leggings, over which I wore a pair of denim shorts (I did say the courier trade wasn't fashionable then). That evening, getting undressed ahead of the obligatory postwork bath, where I would happily steam amid a rising black tidemark of pollution residue, I decided to inspect my new look.

Then came the shock. Not from the leggings. The mirror showed those to be about as curious-looking as I'd expected. What struck me was the encased silhouette of my legs. They had always been traditionally unimpressive. A cruel teenage acquaintance once likened them to lengths of string with knots for the knees. But now they had shape. Form. Muscles. Definite muscles. I was amazed. I spent a good ten minutes on that chair, staring.

In retrospect it might sound obvious that being in your early twenties and exercising vigorously for ten hours a day makes you look and feel much better, but it was a transformative moment for my life. In the months to come I'd occasionally bump into university contemporaries as I delivered packages and, once they'd stifled their surprise that someone with a good degree from a decent university was doing such a job, many would remark on how, you know, *healthy* I looked.

I remained a bike messenger for three years, far longer than strictly necessary. This included a stint in Sydney, Australia, working for a company called Top Gun, who, perhaps believing the name alone wasn't camp enough, kitted out their riders in skintight, hot pink Lycra jerseys. If you didn't start off with some measure of body confidence, you soon picked it up. A couple of times I was on the receiving end of wolf whistles, and I still like to think they weren't ironic.

Amid this period I forgot my lifelong sense of doomed physical fragility. It was always assumed that I was the fittest person in my peer group. Friends in the pub would, after a few drinks, quietly ask to squeeze my thigh muscles. I would race buses from the traffic lights on my bike for fun. I was suddenly invincible.

Let me add some important context here: you don't need to ride three hundred miles a week, every week, or even be in your early twenties, to feel the benefits of cycling. As we'll see, even a relatively sedate daily bike commute can have a near-miraculous health impact at just about any age. And, as mentioned in the introduction, my own cycling is now closer to this more tranquil model. I'm now very much more the everyday rider. It's been some time since anyone squeezed my thigh in a pub.

Given this, I decided to see whether this more ordinary regime was still keeping me healthy. The best way to find out was to take a VO2 max test, which measures peak oxygen uptake. Expressed in milliliters of oxygen absorbed per kilo

of body weight per minute, it's generally viewed as being as good a way as any to objectively measure someone's aerobic fitness, and thus their associated cardiovascular health.

And so I ended up in the sports science laboratory of the University of Kent, a large, windowless room filled with stationary exercise bikes, between which flitted white-coated technicians carrying trays of test tubes. I was there to take what's known as a ramp test, one of the more obviously sadistic procedures scientists are permitted to inflict. This saw me placed on one of the bikes and ordered to turn the pedals at a certain, constant speed while the resistance was incrementally raised, as if climbing an increasingly steep incline. The torment lasted for about twenty minutes until my lungs eventually gave out, and I reached a sweaty, juddering, breathless halt. If that wasn't enough, this was all done while wearing a clammy, full-face rubber mask, while every five minutes someone pricked my finger to extract blood and test it for levels of exertion-induced lactates.

My personal torturer/tester was James Hopker, an affable senior academic at the university, who works closely with British Cycling. The results would take a week to be processed, he told me, gently peeling the mask from my slumped form. What would happen, I thought gloomily, if the conclusion came back that I have distinctly average fitness for a man of my age? Possibly I'd give up the idea for this book.

It's Not Cycling That's Dangerous

Many cyclists will have experienced this conversation at some point. While waiting at a red traffic light, a driver, generally a man, starts chatting through the open car window. "You're brave," they will say in a convivial tone. "Wouldn't catch me cycling. Much too dangerous."

When this happens to me I usually have time for no more than a weak smile before the lights change. But in a parallel fantasy world I would discover the driver's home address and burst through their front door that evening. "Dangerous?" I would bellow, as they stumbled up from the sofa, lit by the flickering blue glow of a flat-screen television. "You think riding a bike is dangerous? It's this TV that's going to kill you." This would, of course, be vastly pompous, and risk a well-deserved punch to the nose. But I'd be right. It might sound counterintuitive, but watching television can be far more dangerous than riding around the truck-clogged streets of a major city.

One major study by researchers at the Maryland-based National Cancer Institute followed more than half a million Americans ages fifty to seventy over eight years. The key conclusion? Watching a lot of TV made people significantly more likely to die, even when you accounted for factors like smoking, age, gender, race, and education. In fact, those who watched the most TV—an admittedly Herculean average of seven hours or more per day—were 60 percent more likely to die during the course of the project than those who limited it to an hour or less.[2]

Here's Dr. Adrian Davis, a British public health expert who is a world expert on how various forms of activity affect our health: "When people say cycling is dangerous, they're wrong. Sitting down—which is what most of the population does far too much of—that's the thing that's going to kill you."[3]

That's not to claim cycling holds no risks. In many countries it's more perilous than it should be. For example, in the United States, it's about five times more dangerous than in the Netherlands, measured by deaths per billion kilometers cycled.[4] But it's also very important to not overstate the hazards. In more or less any industrialized country, the health incentives for cycling massively outweigh the perils, and provably so.

For a 2010 study, researchers from Utrecht University's self-explanatorily named Institute for Risk Assessment Sciences studied dozens of existing papers to calculate what would happen if a hypothetical group of five hundred thousand people switched overnight from cars to bikes: would the health gains from more exercise outweigh the risks from pollution and road crashes?

For the bike-friendly Netherlands the results were, as you'd expect, conclusive: on average the benefits exceeded the perils by a factor of about nine, a figure that increased as people got older. But the effect was dramatically positive more or less anywhere you looked. Even in Britain the life-extending benefits were greater by a factor of seven.[5]

When you expand this effect to a national level, any dangers from cycling, even amid the somewhat feral traffic environment of a New York City, a London, or a Sydney, become a mere speck on public health risk charts.

Every year about seven hundred Americans die on bikes, a figure that could and should be significantly lower.[6] But over the same period at least two hundred thousand of their compatriots die from conditions linked to a lack of physical activity, notably cardiovascular problems and cancer.[7] Even this is likely to be a very conservative estimate. In Britain, public health experts say, the official estimate for this inactivity toll is about eighty-five thousand a year,[8] against one hundred or so cyclists killed annually.[9] Depending on who you listen to, sedentary living is either the second or fourth most common risk factor associated with early deaths worldwide. Not far behind it is obesity, which is itself exacerbated by inactivity.

Those who chronicle these perils say that even relatively small amounts of fairly moderate exercise can slash the risks. Cycling, in particular, has been found to have an almost miraculous effect, in part because it is so easy to incorporate into everyday life, but also because it has a tendency to tempt people into slightly more strenuous effort, magnifying the advantage.

Study after study has shown that people who cycle regularly are less prone to obesity, diabetes, strokes, heart disease, and various cancers. Cyclists don't just get extra life years, they're more likely to remain mobile and independent into older age. Scientists are also only just beginning to under-

stand the effects of exercise on our brains, and how it appears to ward off dementia.

The most comprehensive study of the health benefits of bike commuting, which we'll read more about later, found people who commuted by bike had a 40 percent lower chance of dying during the fifteen-year course of the project than those who didn't. That's not far short of a miracle. If these benefits could be administered in an injection, it would be considered one of the greatest medical breakthroughs of all time. The scientist who devised it would be a shoo-in for a Nobel Prize. Millions of lives a year would be saved. And yet it's already here.

The Pandemic of Physical Inactivity

If you ask a public health expert why cycling is so good for people, they usually begin with the inescapable contradiction that even as human lifestyles have changed beyond recognition in just the past few decades, the basic physiology of our bodies remains more or less the same as it was tens of thousands of years ago. "We are designed as hunter-gatherers, and we've not outlived our biological destiny," says Adrian Davis. "We are meant to be physically active, and within modernity we've done everything we conceivably can, it seems, to remove physical activity from our lives, down to having electric toothbrushes."[10]

The point is echoed by Francesca Racioppi, a senior policy maker at the World Health Organization (WHO), who has

spent twenty years devising programs to make people more active. "We have to bear in mind that the way people live is very different to the way it was not very long ago," she says. "Once, half of us were peasants and another forty percent worked in factories, and those were physically demanding jobs. Now the vast majority of people have switched to jobs where physical activity is excluded, and we have to live with the unintended side effects."[11]

These unintended side effects are vast. In fact, it's not any sort of exaggeration to say the world faces a health catastrophe from sedentary living.

How precisely big a catastrophe depends on who you ask. The subject is complicated, not least because problems caused by lack of exercise inevitably become entwined with those connected to obesity. However, the WHO puts the annual global toll for inactivity alone at around 3.2 million people.[12] That's more or less the entire city of Berlin, dying younger than they should, every year. About nine thousand people a day. On a very gloomy WHO league table of what kills most people around the world, inactivity is fourth, beaten only by high blood pressure, tobacco, and excess blood glucose. But some experts think even this is an underestimate.

Ahead of the London 2012 Olympics, revered medical journal *The Lancet* ran a special issue devoted to what it termed the "pandemic of physical inactivity." One of the papers, led by I-Min Lee, a Harvard professor of epidemiology—the study of population-wide health trends—went further than the WHO estimates. It calculated that inactivity causes between 6 and 10 percent of cases of heart disease, type 2 diabetes, and