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PART I

The Talent Myth
In January 1995, I became the British number-one table tennis player for the very first time which, I am sure you will agree, is a heck of an achievement. At twenty-four years of age, I suddenly found myself on the receiving end of regular invitations to speak to school audiences about my rise to international glory, and would often take my gold medals along to dazzle the youngsters.

Table tennis is a pretty big sport in the UK, with 2.4 million participants, 30,000 paid-up members of the governing body, thousands of teams, and serious riches for those who excel. But what made me special? What had marked me out for sporting greatness? I came up with a number of attributes: speed, guile, gutsiness, mental strength, adaptability, agility, and reflexes.

Sometimes I would marvel at the fact that I had these skills in such abundance that they were capable of elevating me – little me! – beyond hundreds of thousands of others aspiring to that precious top spot. And all this was doubly amazing, considering I had been born into a family in an ordinary suburb of an ordinary town in south-east England. There was no silver spoon. No advantages. No nepotism. Mine was a triumph of
individuality; a personal odyssey of success, a triumph against the odds.

This, of course, is the way that many who have reached the top in sport, or indeed in any other field, choose to tell their stories. We live in a culture that encourages this kind of soaring individualism. Hollywood is full of such narratives, often sugar-coated in that well-known American Dream sentimentality. But while these stories are inspirational, rousing, and compulsively entertaining, are they true? Here is my story in table tennis, retold with the bits that I chose to ignore the first time around, as they diminished the romance and the individuality of my triumph.

1. Table

In 1978 my parents, for reasons they are still unable to explain (neither of them plays table tennis), decided to buy a table tennis table – a super deluxe 1000 with gold lettering, since you ask – and to put it in our large garage. I don’t know the exact percentage, but you can imagine that there were not many youngsters of my age in my home town who possessed a full-size, tournament-specification table. Fewer still had a garage in which it could be housed full-time. This was my first bit of good fortune.

2. My Brother

My second piece of good fortune was having an older brother called Andrew who came to love table tennis as much as I. We would play for hours in the garage after school: duelling, battling, testing each other’s reflexes, experimenting with new spins, investigating new paddles, inviting over friends who, although often more accomplished in other sports, were bemused to see just how far we had advanced in table tennis.
Without knowing it, we were blissfully accumulating thousands of hours of practice.

3. Peter Charters

Mr Charters was a teacher at the local primary school, a tall man with moustache, a twinkle in his eye, a disdain for conventional teaching methods, and a passion for sport that bordered on the fanatical. He was the coach of almost all the after-school sporting clubs, the manager of the school football team, the organizer of school sports day, custodian of the badminton equipment, and inventor of a game called ‘Bucket Ball’, a kind of improvised basketball.

But Charters cared about one thing above all: table tennis. He was the nation’s top coach and a senior figure in the English Table Tennis Association. The other sports were just a front, an opportunity to scout sporting talent wherever it emerged so he could focus it – ruthlessly and exclusively – upon table tennis. No child who passed through Aldryngton School in Reading was not given a try-out by Charters. And such was his zeal, energy, and dedication to table tennis that anybody who showed potential was persuaded to take their skills forward at the local club, Omega.

Charters invited me and my brother Andy to join Omega in 1980, at the very moment we were beginning to outgrow the garage.

4. Omega

Omega was not a luxurious club – it was a one-table hut in a gravel enclosure a couple of miles from where we lived in suburban Reading: cold in winter, ferociously hot in summer, with plants growing through the roof and floor. But it had one
advantage that made it almost unique in the county: it was open twenty-four hours a day, for the exclusive use of its tiny group of members, each of whom had a set of keys.

My brother and I took full advantage, training after school, before school, at weekends, and during school holidays. We were also joined by other Aldryngton alumni who had been spotted and snapped up by Charters, so that by 1981 Omega was becoming something of a sensation. One street alone (Silverdale Road, on which the school was situated) contained an astonishing number of the nation’s top players.

At number 119 were the Syeds. Andrew, my brother, went on to become one of the most successful junior players in the history of British table tennis, winning three national titles before retiring due to injury in 1986. He was later described by Charters as the best young player to emerge from England for a quarter of a century. Matthew (that’s me) also lived at 119 and became a long-serving England senior number one, a three-time Commonwealth champion, and a two-time Olympian.

At number 274, just opposite Aldryngton, lived Karen Witt. She was one of the most brilliant female players of her generation. She won countless junior titles, the national senior title, the hugely prestigious Commonwealth championship, and dozens of other competitions during a sparkling career. When she retired with back trouble at the age of twenty-five, she had changed the face of English women’s table tennis.

At number 149, equidistant between the Syeds and the Witts, lived Andy Wellman. He was a powerful player who would go on to win a series of titles, mainly in doubles, and was widely feared, particularly after defeating one of the top English players in the prestigious Top 12 event.

At the bottom of Silverdale Road was Paul Trott, another leading junior, and Keith Hodder, an outstanding county player.
The Hidden Logic of Success

Around the corner were Jimmy Stokes (England junior champion), Paul Savins (junior international), Alison Gordon (four times English senior champion), Paul Andrews (top national player), and Sue Collier (England schools champion). I could go on.

For a period in the 1980s, this one street, and the surrounding vicinity, produced more outstanding table tennis players than the rest of the nation combined. One road among tens of thousands of roads; one tiny cohort of schoolkids against millions up and down the country. Silverdale Road was the wellspring of English table tennis: a Ping-Pong mecca that seemed to defy explanation or belief.

Had some genetic mutation spread throughout the local vicinity without touching the surrounding roads or villages? Of course not: the success of Silverdale Road was about the coming together of factors of a beguilingly similar kind to those that have, from time to time, elevated other tiny areas on our planet into the sporting ascendancy (Spartak, an impoverished tennis club in Moscow, for example, created more top-twenty women players between 2005 and 2007 than the whole of the United States).

In particular, all of the sporting talent was focused ruthlessly on table tennis, and all of the aspiring players were nurtured by an outstanding coach. And as for me, with a table in the garage and a brother as passionate about Ping-Pong as myself, I had a head start before I even got to Aldryngton.

The Myth of Meritocracy

My parents – bless them – continue to describe my success in table tennis as an inspirational triumph against the odds. That
is kind indeed, and I thank them for it. When I showed them a draft of this chapter, they disputed its entire thesis. Yes, but what about Michael O’Driscoll (a rival from Yorkshire)? He had all your advantages, but he didn’t make it. What about Bradley Billington (another rival from Derbyshire)? He had parents who were international table tennis players, but he did not become England’s number one.

This is merely a slightly different twist on what I call the autobiographical bias. My point is not that I was a bad table tennis player; rather, it is that I had powerful advantages not available to hundreds of thousands of other youngsters. I was, in effect, the best of a very small bunch. Or, to put it another way, I was the best of a very big bunch, only a tiny fraction of whom had my opportunities.

What is certain is that if a big enough group of youngsters had been given a table at eight, had a brilliant older brother to practise with, had been trained by one of the top coaches in the country, had joined the only twenty-four-hour club in the county, and had practised for thousands of hours by their early teens, I would not have been number one in England. I might not have even been number one thousand and one in England. Any other conclusion is a crime against statistics (it is of course possible that I would have been number one, but the possibility is strictly theoretical).

We like to think that sport is a meritocracy – where achievement is driven by ability and hard work – but it is nothing of the sort. Think of the thousands of potential table tennis champions not fortunate enough to live in Silverdale Road, with its peculiar set of advantages. Think of the thousands of potential Wimbledon champions who have never been fortunate enough to own a tennis racket or receive specialized coaching. Think of the millions of potential Major-winning
golfers who have never had access to a golf club.

Practically every man or woman who triumphs against the odds is, on closer inspection, a beneficiary of unusual circumstances. The delusion lies in focusing on the individuality of their triumph without perceiving – or bothering to look for – the powerful opportunities stacked in their favour.

This is one of the central points made by Malcolm Gladwell in his marvellous book *Outliers*. Gladwell shows how the success of Bill Gates, the Beatles, and other outstanding performers is not so much to do with ‘what they are like’ but rather ‘where they come from’. ‘The people who stand before kings may look like they did it all by themselves,’ Gladwell writes. ‘But in fact they are invariably the beneficiaries of hidden advantages and extraordinary opportunities and cultural legacies that allow them to learn and work hard and make sense of the world in ways others cannot.’

Whenever I am inclined to think I am unique and special, I remind myself that had I lived one door further down the road, I would have been in a different school catchment area, which would have meant that I would not have attended Aldryngton, would never have met Peter Charters, and would never have joined Omega. It is often said that in elite sport the margins of victory and defeat are measured in milliseconds: the reality is that they are measured in variables that are far more elusive.

But it is worth pausing here for a moment to consider an objection. You may agree with the thrust of the argument that opportunity is necessary for success, but is it sufficient? What about the natural gifts that mark out the very best from the rest? Are these skills not necessary to get to a Wimbledon final or the top of an Olympic podium? Are they not vital to becoming a chess grandmaster or the CEO of a multinational? Is it not delusional to suppose that you (or your children) can achieve
great success without also possessing rare talent?

This has been the abiding presumption of modern society ever since Francis Galton, an English Victorian polymath, published his book *Hereditary Genius*. In the book, Galton wields the insights of his half-cousin Charles Darwin to come up with a theory of human achievement that remains in the ascendancy to this day.

‘I propose to show’, Galton wrote, ‘that a man’s natural abilities are derived by inheritance, under exactly the same limitations as are the form and physical features of the whole organic world . . . I have no patience with the hypothesis . . . that babies are born pretty much alike and the sole agencies in creating differences . . . are steady application and moral effort.’

The idea that natural talent determines success and failure is, today, so powerful that it is accepted without demur. It *seems* indisputable. When we watch Roger Federer caressing a cross-court forehand winner or a chess grandmaster playing twenty games simultaneously while blindfolded or Tiger Woods launching a 350-yard fade, we are irresistibly drawn to the conclusion that they possess special gifts not shared by the rest of us.

The skills are so qualitatively different, so detached from our own lives and experience, that the very idea that we could achieve similar results with the same opportunities seems nothing less than ridiculous.

The metaphors we use to describe outstanding achievers encourage this way of thinking. Roger Federer, for example, has been said to have ‘tennis encoded in his DNA’. Tiger Woods is said to have been ‘born to play golf’. Top performers subscribe to this way of thinking, too. Diego Maradona once claimed he was born with ‘football skill in my feet’.

But is talent what we think it is?
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What Is Talent?

In 1991 Anders Ericsson, a psychologist at Florida State University, and two colleagues conducted the most extensive investigation ever undertaken into the causes of outstanding performance.

Their subjects – violinists at the renowned Music Academy of West Berlin in Germany – were divided into three groups. The first group comprised the outstanding students: the boys and girls expected to become international soloists, the pinnacle of musical performance. These were the kids who would normally be described as supertalented, the youngsters supposedly lucky enough to have been born with special musical genes.

The second group of students were extremely good, but not as accomplished as the top performers. These were expected to end up playing in the world’s top orchestras, but not as star soloists. In the final group were the least able students: teenagers studying to become music teachers, a course with far less stringent admissions standards.

The ability levels of the three groups were based on the assessment of the professors and corroborated by objective measures such as success in open competitions.

After a painstaking set of interviews, Ericsson found that the biographical histories of the three groups were remarkably similar and showed no systematic differences. The age when the students began practice was around eight years of age, which was the same time they began formal lessons. The average age when they first decided to become musicians was just before they turned fifteen. The average number of music teachers who had taught them was 4.1, and the average number of musical instruments that they had studied beyond the violin was 1.8.
But there was one difference between the groups that was both dramatic and unexpected; indeed, it was so stark that it almost jumped out at Ericsson and his colleagues – the number of hours devoted to serious practice.

By the age of twenty, the best violinists had practised an average of ten thousand hours – more than two thousand hours more than the good violinists and more than six thousand hours more than the violinists hoping to become music teachers. These differences are not just statistically significant; they are extra-ordinary. Top performers had devoted thousands of additional hours to the task of becoming master performers.

But that’s not all. Ericsson also found that there were no exceptions to this pattern: nobody who had reached the elite group without copious practice, and nobody who had worked their socks off but failed to excel. Purposeful practice was the only factor distinguishing the best from the rest.

Ericsson and his colleagues were astounded by these findings, sensing that they heralded a paradigm shift in the way excellence is understood – that it is practice, not talent, that ultimately matters. ‘We deny that these differences [in skill level] are immutable; that is, due to innate talent,’ they wrote. ‘Instead we argue that the differences between expert performers and normal adults reflect a life-long persistence of deliberate effort to improve performance.’

The aim of the first part of this book is to convince you that Ericsson is right; that talent is not what you think it is; that you can accomplish all manner of things that seem so far beyond your current capabilities as to occupy a different universe. But this will not be a wishy-washy exercise in the power of positive thinking. Rather, the arguments will be grounded in recent findings in cognitive neuroscience that attest to the way the body and mind can be transformed with specialized practice.
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After all, what is talent? Many people feel sure they know it when they see it; that they can look at a group of kids and discern from the way they move, the way they interact, the way they adapt, which of them contain the hidden genes necessary for success. As the managing director of a prestigious violin school put it: ‘Talent is something a top violin coach can spot in young musicians that marks them out as destined for greatness.’

But how does the teacher know that this accomplished young performer, who looks so gifted, has not had many hours of special training behind the scenes? How does he know that the initial differences in ability between this youngster and the rest will persist over many years of practice? In fact, he doesn’t, as a number of studies have demonstrated.

An investigation of British musicians, for example, found that the top performers had learned no faster than those who reached lower levels of attainment: hour for hour, the various groups had improved at almost identical rates. The difference was simply that top performers had practised for more hours. Further research has shown that when top performers seem to possess an early gift for music, it is often because they have been given extra tuition at home by their parents.

But what about child prodigies – kids who reach world class while still in adolescence? Have they not learned at a super-fast rate? Well, no. As we shall see in the next chapter, child prodigies may look as if they have reached the top in double-quick time, but the reality is that they have compressed astronomical quantities of practice into the short period between birth and adolescence.

As John Sloboda, professor of psychology at Keele University, put it: ‘There is absolutely no evidence of a “fast track” for high achievers.’ Jack Nicklaus, the most successful golfer of all time,
has made the same point: ‘Nobody – but nobody – has ever become really proficient at golf without practice, without doing a lot of thinking and then hitting a lot of shots. It isn’t so much a lack of talent; it’s a lack of being able to repeat good shots consistently that frustrates most players. And the only answer to that is practice.’

The same conclusion – about the primacy of practice – is reached by widening the perspective, as Ericsson has shown. Just consider the way in which standards have risen dramatically in just about every area of human endeavour. Take music: when Franz Liszt composed *Feux Follets* in 1826, it was said to be virtually unplayable; today, it is performed by every top pianist.

The same is true in sport. When the winner of the men’s 100 metres in the 1900 Olympics clocked 11.0 seconds, it was considered a miracle; today that time would not be sufficient to qualify for the final of the secondary school national trials. In diving, the double somersault was almost prohibited in the 1924 Olympics because it was considered dangerous; now it is routine. The fastest time for the marathon in the 1896 Olympics was just a few minutes faster than the entry time for today’s Boston Marathon, which is achieved by thousands of amateurs.

In academia, too, standards are spiralling ever upwards. The thirteenth-century English scholar Roger Bacon argued that it was impossible to master mathematics in less than thirty to forty years; today calculus is taught to almost every college student. And so it goes on.

But the key point is that these improvements have not occurred because people are getting more talented: Darwinian evolution operates over a much longer time span. They must have occurred, therefore, because people are practising longer, harder (due to professionalism), and smarter. It is the quality
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and quantity of practice, not genes, that is driving progress. And if that is true of society, why not accept that it is also true of individuals?

So the question is: How long do you need to practise in order to achieve excellence? Extensive research, it turns out, has come up with a very specific answer to that question: from art to science and from board games to tennis, it has been found that a minimum of ten years is required to reach world-class status in any complex task.

In chess, for example, Herbert Simon and William Chase, two American psychologists, found that nobody had attained the level of an international grandmaster 'with less than a decade's intense preparation with the game'. In music composition, John Hayes also found that ten years of dedication is required to achieve excellence, a verdict that features centrally in his book The Complete Problem Solver.

An analysis of the top nine golfers of the twentieth century showed that they won their first international competition at around twenty-five years of age, which was, on average, more than ten years after they started golfing. The same finding has been discovered in fields as diverse as mathematics, tennis, swimming, and long-distance running.

The same is even true in academia. In a study of the 120 most important scientists and 123 most famous poets and authors of the nineteenth century, it was found that ten years elapsed between their first work and their best work. Ten years, then, is the magic number for the attainment of excellence.

In Outliers, Malcolm Gladwell points out that most top performers practise for around one thousand hours per year (it is difficult to sustain the quality of practice if you go beyond this), so he re-describes the ten-year rule as the ten-thousand-hour rule. This is the minimum time necessary for the acqui-
situation of expertise in any complex task. It is also, of course, the number of hours that the top violinists had practised in the Ericsson experiment.*

Now think about how often you have heard people dismiss their own potential with statements like ‘I am not a natural linguist’ or ‘I don’t have the brain for numbers’ or ‘I lack the coordination for sport’. Where is the evidence for such pessimism? Often it is based upon nothing more than a few weeks or a few months of half-hearted effort. What the science is telling us is that many thousands of hours of practice are necessary to break into the realm of excellence.

Before going on, it’s worth emphasizing something about the upcoming chapters: the truth of the arguments will have urgent implications for the way we choose to live our lives. If we believe that attaining excellence hinges on talent, we are likely to give up if we show insufficient early promise. And this will be perfectly rational, given the premise.

If, on the other hand, we believe that talent is not (or is only marginally) implicated in our future achievements, we are likely to persevere. Moreover, we will be inclined to move heaven and earth to get the right opportunities for ourselves and our families: the right teacher, access to decent facilities; the entire coalition of factors that lead to the top. And, if we are right, we will eventually excel. What we decide about the nature of talent, then, could scarcely be more important.

To conclude this section, here’s an example from Outliers that evokes the twin insights of modern research on excellence:

*B One rather obvious proviso: in activities where there are not many participants, world-class status can be achieved in somewhat less than ten thousand hours. After all, it is not difficult to be among the best in the world in a sport – or, indeed, anything else – that few others play seriously.
namely, the importance of *opportunity* on the one hand and *practice* on the other.

In the mid-1980s Roger Barnsley, a Canadian psychologist, was with his family at a Lethbridge Broncos ice hockey game when he was alerted by his wife – who was leafing through the programme – to what looked like an extraordinary coincidence: many of the players had birthdays in the early months of the calendar.

'I thought she was crazy,' Barnsley told Gladwell. 'But I looked through it, and what she was saying just jumped out at me. For some reason, there were an incredible number of January, February, and March birth dates.'

What was going on? Had a genetic mutation affected only those Canadian ice hockey players born in the early part of the year? Was it something to do with the alignment of the stars in the early part of the calendar?

In fact the explanation was simple: the eligibility cut-off date for all age-based ice hockey in Canada is 1 January. That means that a ten-year-old boy born in January could be playing alongside another boy born almost twelve months later. This difference in age can represent a huge difference in terms of physical development at that time of life.

As Gladwell puts it:

This being Canada, the most ice hockey-crazed country on earth, coaches start to select players for the travelling rep squad – the all-star teams – at the age of nine or ten, and of course they are more likely to view as talented the bigger and more coordinated players, who have had the benefit of critical extra months of maturity.

And what happens when a player gets chosen for a rep squad? He gets better coaching, and his teammates are better, and he
plays fifty or seventy-five games a season instead of twenty
games a season . . . By the age of thirteen or fourteen, with the
benefit of better coaching and all that extra practice under his
belt, he’s the one more likely to make it to the Major Junior A
League, and from there into the big leagues.

The skewed distribution of birth dates is not limited to the
Canadian junior ice hockey league. It is also seen in European
youth football, and US youth baseball; indeed, most sports in
which age-based selection and streaming are part of the process
of moulding the stars of the future.

This punctures many of the myths that cling to elite
performers. It shows that those who make it to the top, at least
in certain sports, are not necessarily more talented or dedicated
than those left behind: it may just be that they are a little older.
An arbitrary difference in birth date sets in train a cascade of
consequences that, within a matter of a few years, has created
an unbridgeable chasm between those who, in the beginning,
were equally well equipped for sporting stardom.

Month of birth is, of course, just one of the many hidden
forces shaping patterns of success and failure in this world. But
what most of these forces have in common – at least when it
comes to attaining excellence – is the extent to which they confer
(or deny) opportunities for serious practice. Once the oppor-
tunity for practice is in place, the prospects of high achievement
take off. And if practice is denied or diminished, no amount of
talent is going to get you there.

This speaks directly to my experiences in table tennis. With
a table tennis table in the garage at home and a brother to
practise with, I had a head start on my classmates. It was only a
slight head start, but it was sufficient to create a trajectory
of development with powerful long-term consequences. My
superior ability was taken for evidence of talent (rather than lots of hidden practice), and I was selected for the school team, leading to yet more practice sessions. Then I joined Omega, the local club, then the regional team, then the national team.

By the time – a few years later – I was given a chance to perform in an exhibition match in front of the whole school, I possessed skills of an entirely different kind from those of my classmates. They stomped their feet and cheered as I whipped the ball back from all parts of the court. They marvelled at my finesse and coordination and the other 'natural gifts' that marked me out as an outstanding sportsman. But these skills were not genetic; they were, in large part, circumstantial.

In the same vein, it is not difficult to imagine a spectator in the stands of a major league ice hockey match watching in awe as a former classmate scores a winning goal of spellbinding brilliance. You can imagine him standing and applauding and, later, congregating with friends for an after-match drink to eulogize his hero and to reminisce about how he once played ice hockey alongside him at school.

But now suppose you suggested to the ice hockey fan that his hero – a player whose talent seems so irrepressible – might now be working in the local hardware store had his birthday been a few days earlier; that the star player could have strained every sinew to reach the top, but his ambition would have been swept away by forces too powerful to resist, and too elusive to alter.

And now imagine suggesting to the fan that it is just possible that he may himself have become an all-star ice hockey player had his mother given birth just a few hours later: on 1 January instead of 31 December.

He would probably think you were crazy.