allen lane

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The Darker the Night, the Brighter the Stars

A Neuropsychologist's Odyssey

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For Sonja, a beautiful soul

All men think all men mortal, but themselves

Edward Young, *Night Thoughts*

Now he has departed from this strange world a little ahead of me. That signifies nothing. For those of us who believe in physics, the distinction between past, present and future is only a stubbornly persistent illusion.

Albert Einstein, from a letter of condolence on the death of his friend, Michele Besso

Prologue

This wasn't my idea. Give the reader a lamp, they said, to lead them to the door. Pin a note to the door. Forewarn them it's a rambling, ramshackle house they're about to enter. I was more inclined to let you find your own way in and leave you to it. But, second thoughts.

This is not a conventional book and I think you should know what you're in for. What (I hope) you are about to read is a mix of memoir, neurological case stories, and reflections on life, death and the mind. I've thrown some Greek myths into the pot, and sundry other tales, some true, some not. Fact sits alongside fiction. Science tangles with myth. The fictional elements are, for the most part, easily identified. I don't have an autonomous subpersonality capable of seducing women in fluent French, for example, and I have yet to celebrate my one-hundred-and-fiftieth birthday. The case stories are mostly drawn from my experiences in clinical neuropsychology. Names have been changed and other layers of disguise added to preserve patient anonymity. There are two exceptions to the anonymity rule. One is the story of Pat Martino, the jazz guitar virtuoso, whose remarkable recovery from a near-fatal brain haemorrhage has long been celebrated in jazz circles. The other is Carla MacKinnon, film-

maker and sleep paralysis sufferer, whose short film about that strange condition, *Devil In The Room*, has been screened at festivals and medical conferences worldwide. As for the autobiographical stories, I have changed some names, and one or two other inconsequential details, but they are otherwise as true as I could make them. A few minor liberties have been taken with the Greek myths, but, really, that's what you're supposed to do. All stories, fact and fiction, hang loosely around two perennial questions: *What are we?* and *How should we live?* And, throughout these pages, there is the echo of my wife's words in her dying days: *You don't know how precious life is. You think you do, but you don't.*

The book will make most sense if you read the first chapters first and the last chapters last, but otherwise you should feel free to skip and roam. Some chapters interlink, others don't, at least not explicitly, but no doubt you will make connections I didn't plan and haven't seen. The brain is a pattern-detecting device. It finds shapes and designs and meanings all over the place. 'Ah,' someone said, 'so it's a metaphor for the brain itself!' The way the mind hangs together, she meant, logic linked to magic, dreams, hopes, memories, broad vistas, blind alleys, and always a sense of rolling along, hour by hour, of heading somewhere, even if that somewhere, ultimately, is nowhere. Yes, I declared, you've hit the nail on the head, though, in truth, it had never occurred to me.

There is no clear dividing line in the brain between inner imaginings and perceptions of the real, solid 'world out there'. Reality and fantasy are built into the same neural circuits. I wanted my stories to reflect that fact because, I believe, it rests at the core of what it is to be human. That's why, as you find your way about this rambling, ramshackle house of a book, you will encounter almost as many gods,

ghosts and mythic beasts as real-life people. It's also why the neurological patients I have chosen to write about are so often people who inhabit the twilight zones of the mind. You will meet a man who believes he is dead but can tell you the story of his life, and a woman whose life story has been erased. There's a young man whose left hand has a menacing life of its own, and an old man who doesn't know his left hand from his right or, indeed, his hands from his feet, or his feet from his ears, and women plagued by foul-mouthed monsters of the dream-world as they lie in their beds, wide awake but trapped in paralysis.

Observe the flow of patients through the neuro wards and clinics closely enough, and for long enough, and you will inevitably meet such people. Look into their disordered brains and you will learn something of the infrastructure of the self, yours as well as theirs. Look into their eyes, too, and see your own fragility.

So the lamp has led you to the door. Open it. Enter. Find your way along the gloomy hallway. Climb the stairs. At the top there is a door, slightly ajar. See? Push, and the door will open into a sunlit room, forever sunlit, regardless of the depth of the night.

The Sunlit Room

Boofff ...

The oxygen machine exhales. It goes all through the day, all through the night. My wife exhales, like a sigh of resignation. It's six in the evening and she hasn't opened her eyes today, or spoken a word. This day, between her birthday and our wedding anniversary, is the day she dies. Yesterday the boys and I dabbed green tea on her lips and she smiled, but not today. Another long sigh. Her final breath? Not yet. There's another, and another. And then no more. The last is like the wash of a wave fading into sand. The oxygen machine is still breathing. I remove the wedding ring from my wife's dead finger, and box it in my fist. The machine exhales. I exhale. It scarcely missed a breath, this ring. I turn off the oxygen machine. Kate lies bathed in evening sunlight, the flesh of her arms already beginning to bruise with draining blood.

It was the autumnal equinox, September 23rd. The sun had crossed the celestial equator and our last summer was behind us. Perfect timing. She couldn't face another winter, she'd said. There was a full moon that night. I stood in the back yard. I took a slug of whisky and I thought: What next? We had discussed *what next* a good deal that summer, knowing her death was imminent. 'You'll be fine,' she'd say, 'I'm not worried about you.' I had a lot going for me. It would be a release.

'And it won't be long now.'

'Oh, that's all right then.'

‘But, I’ll tell you something. You don’t know how precious life is. You think you do, but you don’t.’

I couldn’t argue with her. She was dying. What did I know? I look back on it now as a good summer, despite everything: painful, penetratingly sad, but without despair, and shot through with extraordinary moments of joy. It vindicated our decision. Precisely one hundred days before she died we were sitting in another sunlit room at the hospital. A doctor was telling us that the cancer had spread beyond all hope of containment. ‘How long?’ Kate asked, and ventured her own estimate: ‘Six months?’ But there was a pause before the doctor answered, ‘Perhaps.’ The best he could offer, the last resort, was another course of chemotherapy, which, if it worked, would extend her life by a couple of months at best. It would be the kind of chemotherapy that made your hair and fingernails fall out, and made you sick to your bones. We knew all about chemotherapy. And the chances of it working? ‘One in five.’ We didn’t have to decide right there and then, the doctor said, the following week would do, but the disease was moving fast and treatment, if that was the choice, could not be delayed much longer.

We agreed, on the drive home, that it was not a decision to take on impulse. We would discuss it with Tom and Nat, our sons; we would weigh the pros and cons and do our best to make sense of the uncertainties. And in the days that followed we did those things. There was no agenda. Discussion came piecemeal over lunch on the patio, or watching the sunset up on the seafront, or in the quiet of the early hours, and we assembled the fragments forensically. It’s your decision, the boys said. We’ll support you in whatever you do.

My first thoughts, back there in the consulting room, had lined up pretty smartly against the idea of further treatment.

Even as the doctor spoke, I was doing the existential equations. I factored in the probabilities alongside the pain and indignities, and I could see no good reason to intensify and prolong the suffering, which was already considerable. The end was inevitable and close now, treatment or not. Better to take what we could from the last days, not lose them to the ordeal of chemotherapy. If the treatment didn't work, which was likely, then it would just be adding insult to injury.

I kept those thoughts to myself at the time. If Kate was forming a different view, and I got the impression she was, then it was not for me to interfere. It was her life. And before long I began to see other sides to the argument. She had responded well to aggressive forms of chemotherapy in the past. Why not now? And why was the doctor being so conservative, so pessimistic, about the outcome? Oncology is not an exact science. They get these things badly wrong sometimes. I was given six months to live, you hear people saying, and here I am, five years on, fighting fit! So, I made the case for treatment. I said perhaps it was worth a shot. 'I don't want to die with no hair,' she said. Rational deliberation had little to do with it in the end. It came down to a *feeling of rightness*.

There are practical matters to deal with in the minutes and hours following a death. I called a doctor to conduct the certification, and a soft-spoken Ghanaian man showed up. I asked him if he could recommend an undertaker because, bizarrely in retrospect, I hadn't given the matter any thought. The doctor went on his way and I called the Co-operative Funeral Service and, while we were waiting for the undertaker, the boys and I took turns to say goodbye. I stroked her hair. When the body was removed, we – Tom, Nat and I, and Nat's wife, Rosie – ate some pasta and drank some wine. We talked about Kate. Her death felt, unexpectedly, like

an accomplishment. It was a peaceful end, we agreed, a dignified one, and the suffering was over. I could not face spending the night in our, now just *my*, bedroom, so I laid a mattress on the floor in Tom's. I read Seneca's *Letters from a Stoic* for a while before settling to sleep, and I slept well. The next day, our anniversary, I took Kate's wedding ring to a jeweller for resizing. I'd promised her I would wear it for the rest of my life.

In the days that followed there was the funeral to arrange, and details to gather for the Registrar of Births and Deaths, who, when I got to see him, told me he was sorry for my loss, a phrase that must pass his lips fifty times a week, and then he gave me an old-fashioned fountain pen to sign some forms. Then there's the funeral, and that's it. A life concluded; a death documented.

Then the memories started pushing through. Doors opened into unexpected rooms. Through this window, a crisp winter morning, through that, a summer's afternoon. Fragments of childhood swirled up like leaves in a flurry. Schooldays. Work. The early years with Kate. I opened the back door and there we were, standing in a downpour. The scent of hard rain on dry earth. Soaked to the skin. Alive. The images were involuntary and spasmodic, as if my brain were trying to gather threads of meaning without much involving 'me', churning the memories, poking and probing. Reconstructing. *Who are you? What next?*

What next? No idea. I was wandering through a mist, not knowing what to expect when the sun burns through. *When I'm gone, just get on and do whatever you must*. But what? Sell the house, she said. Pack in the job. Move to another town. Find another woman. Anything. *I'll be just a memory*.

I decided to follow Kate's advice and retire from work at the earliest opportunity. *You're getting stale.* I was. *You've no*

appetite. True. *Let go*. She had it all figured out. I could use her life insurance money to pay off the mortgage, and, within a couple of years, I'd be eligible to apply for an early retirement package, which would give me a small pension to live on. So I found myself entering a branch of the Cheltenham & Gloucester Building Society, briskly signing a cheque for ninety-six thousand, four hundred and eighty-eight pounds, forty-three pence, and going back out into the street with a tear running down my cheek. You get those stabs of absence to the gut when you least expect them. Eighteen months later I resigned my university post and got on with the things I'd much rather be getting on with. Walking the moors. Country pubs. Football. Reading. Loafing.

Believe me, I'm a good loafer, but my brain wouldn't rest.

The Wooden Sword

My first encounter with the brute fact of death was this. I see myself in the back yard, a small boy, watching his father, sleeves rolled, chipping away at a length of wood with a pocketknife. He was forever hammering and fixing things and making stuff. Sometimes he turned his hand to toys: bows and arrows, catapults and carts. On country walks he cut whistles from birch branches. He once turned an upright piano into a drop-leaf table. Now he's putting the finishing touches to a sword. I remember the whiteness and the sappy scent of the stripped wood. I loved the sound it made when I swung it against the gatepost. *Thock!* Job done, Dad goes back inside the house.

Three boys appear, brothers new to the neighbourhood. They want the sword. 'Ah, go on,' they say. 'Lend it to us. We'll bring it back tomorrow.' I don't want them to have it but they take it anyway, and I watch, mute, as the three of them scrap over first rights to the trophy, and then they're off, laughing and cursing, and I feel bad because I've let my dad down. I tell him they've promised to return the sword tomorrow, but he shrugs and says no, that'll be the last I'll see of it.

That night the boys' house burns down. They, their mother and two sisters all perish. The father survives. Next morning I go to look at the smouldering shell of the building, at the glassless windows and blackened bricks. There are television news cameras. A dead, damp smell hangs over the place. In the following weeks, I develop a fear of fire so bad I can't

tolerate the fire my dad builds in the kitchen grate each morning. 'Look,' he says, striking a match, 'nothing to be afraid of.' But it's as if he's struck the match inside my stomach. I'm taken to see the doctor, who also strikes a match.

I had already considered the dread possibility of my parents dying, but now I start to contemplate my own death. I know about Heaven and Hell and expect to go to Heaven, so why worry about dying? Heaven is a nice place where good things happen for ever. It's where God lives and it would be a happy place to be, a fairground of a place, and the happiness would never end. But now the wraith of a different fate is lurking in the shadows of my brain: non-existence. Maybe the three brothers had gone to Heaven but, then again, maybe they hadn't gone anywhere. Perhaps their bodies had been burnt to cinders and that was that.

It said in the local newspaper that a paraffin heater toppling over and setting light to a mattress probably caused the fire. I see the brothers in their pyjamas. They're playing pirates or something, charging around and jumping on their beds and rolling around, and their dad is shouting up the stairs at them to keep the noise down. The paraffin heater is hissing softly. They ignore their dad. Then one of them grabs the wooden sword and swings it wildly and it catches the top of the heater and sends it tumbling against a bed. It set me wondering. If I'd refused them the sword, if I'd been stronger, perhaps the fire would not have happened and the brothers and their mother and sisters would still be alive. But nobody knows for sure what really happened, only God, because he watches everything. He saw what started the fire and he watched them all burn.

Know Thyself

Apollo, the Greek god of healing and disease, music, logic and light, founded a temple on the slopes of Mount Parnassus. He had journeyed from Crete in the form of a dolphin, and Delphi became the name of the sacred site upon which the temple was built. Inscribed in the forecourt was an injunction: *Know thyself*. For centuries thereafter Apollo channelled prophecies through the Oracles at Delphi, a succession of priestesses, called Pythia. It was a Delphic oracle that inspired the great thinker Socrates to pursue his 'divine mission' in philosophy. His friend, Chaerephon, had asked the oracle if there was anybody alive wiser than Socrates, and 'None' was the answer. Socrates was intrigued because, he said, if there was one thing he knew, it was that he knew nothing. Apollo could not be wrong, though, so perhaps it was his own understanding of wisdom that required examination. What was it that he, Socrates, had that set him apart from the politicians, the poets and the craftsmen who seemed to be blessed with more knowledge and talent? He made it his mission to solve this riddle and, in so doing, set the course for the future of Western philosophy and science. It turned out that what he had in abundance was the capacity to question, to doubt and to reason. He also had the wisdom to see that the pursuit of truth was more important than the pursuit of material wealth. Truth and the perfection of the soul through the cultivation of virtue were the foundations of a good life. This required continual self-scrutiny. The unexamined life, he said, was not worth living.

The 'good life' was also a central concern of the Stoic school of philosophy, founded in Athens by Zeno of Citium around 300 BCE, a hundred years or so after the death of Socrates, and flowering three hundred years later in the work of the great Stoic philosophers of the Roman era: Seneca, Epictetus and Marcus Aurelius. For the Stoics, a life worth living was one lived in accordance with nature, which meant not so much living in harmony with the natural world but, more particularly, living in line with our nature as human beings. So the question *What are we?* precedes *How should we live?* Now, for the Stoics, we are, above all else, rational beings, and should strive to lead our lives accordingly.

Friedrich Nietzsche, the nineteenth-century German thinker, who referred to himself variously as the first Immoralist, the Anti-Christ and the Annihilator, didn't have much time for the Stoics. He thought their injunction to live in accordance with nature was vacuous, but his own Theory of Eternal Recurrence contains something of the spirit of Marcus Aurelius:

> What if a demon crept after you one day or night in your loneliest solitude and said to you: 'This life, as you live it now and have lived it, you will have to live again, times without number; and there will be nothing new in it, but every pain and every joy and every thought and sigh and all the unspeakably small and great in your life must return to you, and everything in the same series and sequence – and in the same way this spider and this moonlight among the trees, and in the same way this moment and I myself. The eternal hour-glass of existence will be turned again and again – and you with it, you dust of dust!' – Would you not throw yourself down and gnash your teeth and curse the demon who thus spoke? Or have you experienced a tremendous moment in which you would have answered him: 'You are a god and never did I hear anything more divine!'

So instead of imagining each day to be your last, as Marcus Aurelius counselled, consider the opposite: the possibility that each and every day is destined to be repeated, in precise detail; that your whole life will roll out over and over again for all eternity. Either way, you would strive to make it a good one.

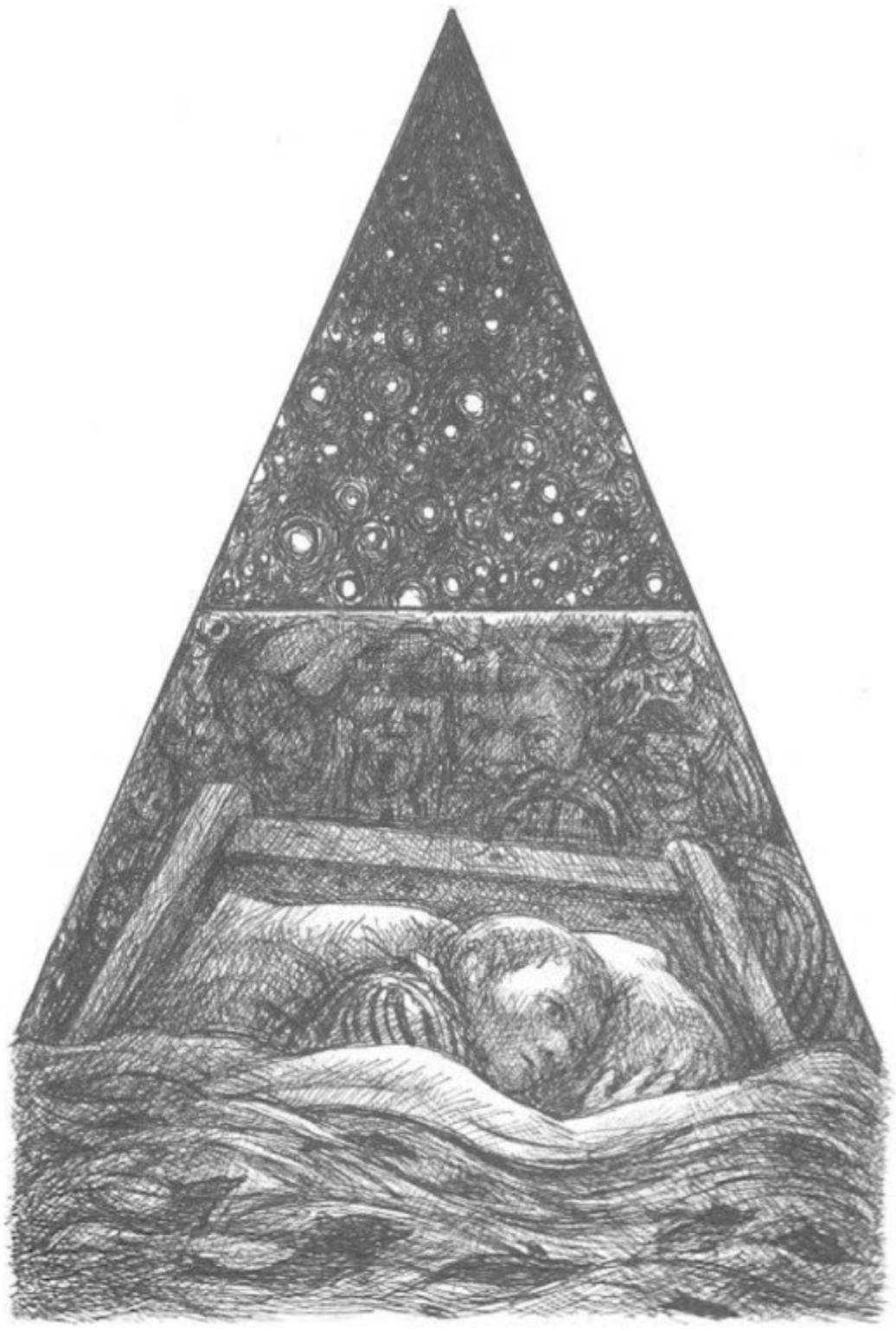
The Stoic recommendation to live life in accordance with our rational nature is all well and good. The faculty of reason is a distinguishing feature of the human mind, but we have other distinguishing features, and if we are to heed the maxim inscribed in stone at the Temple of Apollo – *Know thyself* – then we must also take into account intuitions, dreams and imaginings. More than that, in the Socratic spirit of questioning everything, we should go further and doubt whether it is actually ever possible to know one's self. We should doubt even that there are such things as selves.

I once gave a public lecture in a provincial town hall. At the end of my talk a woman rose from her seat and strode towards the front. 'You smug *know-it-all*!' she shouted, 'I want to shake you by the lapels!' One of the organizers stepped up ready to intervene, but the woman was already making for the exit. '*You* might be a soulless machine,' she said in a parting shot, 'but I most certainly am not.' She was upset because I'd rounded off the talk with a nihilistic flourish. I'd said that studying brain function and working with brain-damaged people had led me to the view that the inner sanctum of the self is a void. There is no inner sanctum. Science has done away with the soul. There's no ghost in the machine, just a machine. But the soul's secular cousin, Self, doesn't really stand up to scrutiny either, if by self you mean some immutable inner essence, a fixed, observing 'I' that follows us down the years, that is, in fact, 'us'. Oh, and by the way, free will is also an illusion. Altogether, our deepest

A stooping of the shoulders. Or so it seemed. He was nothing to start with, Napoleon, just a set of grey plastic fragments in a box, but in the process of assembly – arms, legs, torso, face – a malignant presence grew. When the painting was done – blue greatcoat, white breeches, black boots – the presence filled the room.

The boy gets out of bed, walks across the linoleum and pisses into a bucket. He goes back to bed, never taking his eyes off Napoleon. Great pellets of rain start rattling the tin roof of the shed across the yard.

Next morning is bright and sunny. It's a Saturday. There's pop music playing on a radio somewhere. The boy has been lying on his bed, staring for a long time at the Airfix models on the mantelpiece: the Lancaster bomber; Joan of Arc; the Spitfire; the Black Prince; Napoleon Bonaparte. Bonaparte stares back. He gets up from his bed, holding the Emperor's gaze. He goes over and grabs him and walks steadfastly down the tight curve of stairs to the kitchen, and he throws him on the fire and watches him melt. The fire doesn't frighten him any more.



Man wakes.

The night was teeming with dreams. He stares at the ceiling. The sleep-stiff cogs and gears of thought crank up. To begin with we are nothing. Sperm meets ovum. The fertilized egg divides, and the divisions divide, and go on dividing, and a foetus develops. Arms, legs, torso, face slowly assemble. A baby is born, grows into a child, and somewhere along the line a flame ignites. Flesh and bone make magic. Then, sooner or later, the flame goes out.

He fumbles for the radio on the bedside table, then stares at his hands, deep into the ridges of the skin. *I'm still here.*

Monday, October 17th

Slept well enough but felt a bit ragged due to a couple of drinks over the usual last night.

Lay in listening to the radio. Start The Week, *with Richard Dawkins, Rabbi Jonathan Sacks, and the physicist Lisa Randall, all*

plugging their latest books. Sacks came over as smug and incorrigible. Dawkins sounded weary of him. The Chief Rabbi spoke blithely of Christianity as a 'right-brain religion' translated into a 'left-brain language'. He made a portentous closing statement: 'Without God, there is no hope.' In between he was claiming that only religion could answer the questions: 'Who am I? Why am I here? How should I live?'

10 min late for a 10 o'clock tutorial, students waiting blank-faced outside my office. Lectures all afternoon. Walked home via Devil's Point. Sat half an hour on the bench where I used to sit with Kate, watching darkness descend over the turbulent water.

Going down with a cold. Thought I deserved a medicinal whisky. Just the one. A large one though.

My grandson was due to arrive in the world today, but no new baby by close of play.

An empty theatre. On stage: two old men sitting in armchairs. An AK-47 assault rifle is propped against one of the chairs, and there's an electric guitar against the other. The objects are the old men's offspring, because, it seems, the man on the left is Mikhail Kalashnikov, who designed the rifle, and the man on the right is Les Paul, who designed the guitar. A vodka bottle stands on a low table between the two of them, the brand named in Kalashnikov's honour. Outside, through the window, it could be Izhevsk or it could be New Jersey. Kalashnikov stands, picks up the guitar and pulls it to his bemedalled breast. It's heavier than he thought and his arms sag. But, with a clowning face, he nods at Les, then at the AK-47 and then again at Les. No words are exchanged. Les gets up and walks to the front of the stage. He shields his eyes against the lighting and says, 'You'll have to remind me. I can't remember her name. What was her name? I'm getting a little forgetful.' I'm watching from the stalls. A woman in the seat

behind leans forward. She whispers, '*You* might be a soulless machine, but I most certainly am not.'

The meaning of the dream seemed clear at the time.

Wednesday, October 19th

Nat phoned at 2.20 a.m. relieved and happy that the baby has arrived. Quick delivery at 1.03. Rosie is fine. At lunchtime he sent a picture, baby settled in his cot after a bath. Beautiful. This is the anniversary of the day I met Kate.

Baby Harry was one of around 370,000 new human beings launched into life on planet Earth on 19 October 2011. The same day that he and his cohort were taking their first breaths and blinking at the blooming, buzzing confusion of it all, roughly 155,000 people took their last and slipped into oblivion. Entrances and exits. We are born; stuff happens; we die. Why? No reason. The rabbi asks, 'Why am I here?' but it's a question loaded with the assumption that there is in fact some preordained, cosmic purpose to life. No, we are here by way of the blind physical forces of the universe, the evolution of life on Earth, and the contingencies of human history. We're here because we're here because we're here, as the soldiers sang in the First World War.

We have no say in being born, and the fact that we exist at all is a matter of pure and improbable accident: that particular mother; that particular father; that particular egg from the million a woman is born with; that particular sperm from the 250 million released in an average ejaculation. A vast cascade of events, big and small, determines our development from conception to the present moment.

My father, a Latvian refugee, arrived in England at the port of Hull in 1947. He and his compatriots were taken to Shropshire to work on the land. It was there he met my

mother one day when she was out cycling in the countryside. She had a puncture; he fixed it. So, if I owe my existence to the Second World War, and to my father's status as a displaced person, I owe it, no more nor less, to a nail left lying on a country road.

My wife and I met because I missed my bus and turned up too late for a date with someone else. You look a bit lost, she said. Our children and grandchildren owe their existence to my unpunctuality, as well as to the nail on the road and the Second World War. Et cetera, et cetera. We're here because we're here because we're here.

'Same again?' This is my friend Rob.

'No, I've got a date.'

'Half?'

'Go on, then.'

A glass of beer. A missed bus. Another throw of the dice.

The odds against me being 'me' and you being 'you' are incalculable. But here we are. We don't choose our parents or the historical period and culture into which we are born. Sex is genetically determined, as, to some degree, is sexual orientation. Nor are we blank slates when it comes to temperament or potential for achievement. I could never have been an Olympic athlete, a chess grandmaster, or an operatic tenor. My limbs, my lungs, my brain and my vocal apparatus are not built that way.

In Burma my grandfather came close to being eaten by a tiger, or so the story goes. I like to think it's true and sometimes imagine a parallel history in which the tiger sprang and swallowed all possibility of my future existence. It's somehow less troubling to think you might never have existed than trying to grasp the idea of ceasing to exist at

of the universe, unfathomable. Equally unfathomable is the thought that there is no beginning or end. The boy (I will claim him as me, at least for now) sometimes pictures himself sitting in a clear plastic bubble. It's a time machine. There's a lever. You push it to go forward and you pull it to go back and there's a digit counter showing the date. So there he is, sitting in the bubble, and he yanks the lever back, hard, and the world outside the bubble is a blur of Spitfires, penny-farthings, knights in armour and wheeling pterodactyls. Then it's a barren, volcanic landscape, and then there's nothing but space and stars and silence, because this a time before the Earth was formed. Then what? Was there a time before that, before the stars, when there was nothing at all? He watches as, one by one, the stars are sucked back into the void until, finally, he's left sitting in the bubble with the years rolling endlessly back on the counter, black space all around, nothing happening.

The journey into the future goes like this. You whizz through a world of robots and flying cars and gleaming skyscrapers thrusting up through the clouds, and silver-finned rockets flying to the Moon, but, soon enough, all this disappears. The Sun gets old and, in its death throes, expands and swallows the Earth, and all the other stars get old and die. You sit in the bubble in the dark, dead universe watching the years rolling on for ever and ever. Nothing happening. Everything comes to an end in the end, and the end is endless.

Big Bang, Little Whispers

When was the last time I slept through the night? I woke at four in the morning and tuned in to the World Service, as usual, to dull my brain, but this time it kept me awake. There was some physicist talking about the origins of the universe and how physics can explain how something, that is, the universe, can pop into existence out of nothing. But surely there has to be the *potential* for something to happen, and potential would be something rather than nothing, wouldn't it? And if so, where does that come from? Or is that a stupid question?

Clearing out the utility room I found some old photos, boxed and carefully catalogued: Oxford, '80–'83, Leeds '87–'91, and so on. Kate must have sorted them in the last months. I seem to remember she said she would, but didn't take much notice at the time. There's a picture of her in full bloom, naked and pregnant. Others from long-gone Greek summers and Lake District winters. How fresh and pretty she looks.

In the afternoon I went out for a walk on Dartmoor, a soggy, blustery trek to the prehistoric settlement at Merrivale and the tors beyond, and I had this thought sitting atop King Tor: 13.8 billion years ago there's a Big Bang and *all this comes from nothing!* Then thoughts about the thought: a thought is something reducible to electrochemical pulses in the circuits of my brain, so a representation of the Big Bang and all that *something from nothing* is coded in my neurons, in ways mysterious to *me.* And then this thought about that thought: there's another kind of something from nothing

going on here because there's also a spark of consciousness in the mix, which is, in effect, all that something from nothing out there – the moors, the sky, the stone circle in the valley, the whole something from nothing cosmic shebang – *thinking about itself*, conscious of itself, through the machinery of me, a bundle of neurons and sense receptors perched, for no particular reason, on a slab of rock. Big Bang, and, billions of years later, little whispers. Little whispers of awareness. The universe talking to itself. Perplexed. Bemused.

I listened to the football commentary on the drive home. Wolves v. Albion. Wolves lose 2–0. That's five defeats in a row. I can't bear to listen after the second goal goes in and had to avoid *Match of The Day*. Why does it bother me, even slightly? I was getting engrossed in games even through the toughest times with Kate, when, if ever football didn't matter, it was then. But still, you do.

That Thing You Do the Time With

The great topmost sheet of the mass, that where hardly a light had twinkled or moved, becomes now a sparkling field of rhythmic flashing points with trains of travelling sparks hurrying hither and thither. The brain is waking and with it the mind is returning. It is as if the Milky Way entered upon some cosmic dance. Swiftly the head mass becomes an enchanted loom where millions of flashing shuttles weave a dissolving pattern, always a meaningful pattern though never an abiding one; a shifting harmony of subpatterns.

Charles S. Sherrington, *Man on His Nature*

'Frank, where's your nose? Where's your ankle? Show me your ear.'

The younger man is saying these things to the older man sitting opposite. They are facing one another, just close enough to touch. Frank is concentrating hard, giving each question careful thought. He responds by pointing in turn to his right shin and his left forearm and then by patting the top of his head. 'Where's your shoulder?' He points to his left knee.

I'm sitting with a group of students watching a video of Frank and my younger self performing a familiar routine. The old man is long dead and it occurs to me that, with the passage of time, twenty-two years, every molecule of my younger self has been replaced. The body's tissues are constantly regenerating. Old cells are discarded and new ones grow to take their place. Neither of those bodies has survived. But I'm still here. I shift my eyes from the screen, look close

at the palm of my hand, deep into the ridges of the skin. Yes, I'm still here.

Now we're watching Frank and me sitting side by side at a white-topped table. I reach into a bag and place a clock on the shiny surface. He watches without comment as various other objects are set in a row before him: next to the clock is a fresh strawberry, next to that a toothbrush and, finally, a banana. The banana gets a laugh. 'What's this?' I say, pointing to the clock. 'Oh it's a ... you know ... oh what is it called ... that thing, you know, that thing you do the time with. I can't remember. I know what it is.' Each of the objects elicits the same kind of response. 'I know what it is,' he says of the strawberry and the banana, 'you eat it.' He picks up the toothbrush and mimes a brushing motion in front of his bared teeth.

My former, long-dismantled self is sitting with long-departed, long-disintegrated Frank in a windowless basement room in St James's Hospital, Leeds. The year is 1989 and this is my first job as a neuropsychologist. Prior to this I've spent six years doing clinical psychology training and doctoral research, following which a couple of years as a scientist with a pharmaceutical company, researching the effects of drugs on memory. So by the time I get to St James's I'm familiar with the landscape of the brain and have a working knowledge of its disorders and frailties: the strokes, the degenerative diseases, the epilepsies, the traumatic injuries, and so on, but that hasn't prepared me for the daily grind of life in a general hospital. The variety of referrals is bewildering. All those years of study and research and, I realize, I still don't know very much. It still feels like that. Whatever I am, and whatever I've done, it's always felt like I've blagged it and someone, sooner or later, is going to find me out.

‘It’s not a dementia.’

‘Stroke?’

‘You’re getting there.’

I tell them to forget about the brain for now. Focus on the mind. What are Frank’s *functional deficits?* What can’t he do? Psychology is never enough to confirm a neurological condition, I explain, but in Frank’s case, the diagnosis was unexpected and psychological assessment was instrumental in identifying the problem. I tell them we’ll discuss the case next week but they should mull it over in the meantime and see what they can come up with.

I remember seeing Frank off at the end of the session. His wife gave him a dig: ‘Frank Slater, you don’t know your arse from your elbow.’ ‘No, love,’ he said.

To the students: ‘Clue: what’s the most striking thing about Frank’s presentation?’

Silence.

‘He doesn’t know his arse from his elbow.’

Silence.

At the end of the lecture I resolve never to show the video again. I’m tired of seeing my video-self getting younger, while the flesh-and-blood version grows relentlessly older. I make this resolution every year.

In memory, I follow Mr and Mrs Slater through the door of the windowless basement room, along busy hospital corridors and out into the sunshine of a Yorkshire summer. They go their way, I go mine. I have taken off my tie. I am driving home. What was the car? Can I reconstruct the route? Not sure I can, precisely, but more or less. I drive through mazy streets of redbrick back-to-backs and out onto the York Road, on through suburbs whose names are lost to me, to Garforth, an old mining town six or seven miles away, to my own redbrick terrace house. Inside I find my ‘lady’. In this time-

trip she wears blue jeans and a flame-red top. Toddler Tom jog-toddles to greet me. Blond baby hair, blue dungarees. Nat's in the back yard kicking a football.

Stardust

It takes roughly seven billion billion billion atoms to build a 70kg human being. Adjust this figure according to your weight. The bulk of you (93 per cent) is made up of oxygen, carbon and hydrogen, with nitrogen, calcium and phosphorus atoms accounting for most of the remaining 7 per cent of your mass. Hydrogen has been around since the Big Bang, but the other elements are spewed out from the fusion factories of dying stars.

Atoms get recycled. Your atoms were once the atoms of other objects and people. You contain atoms that once were the atoms of birds and trees, oceans and clouds. It is statistically almost certain that, in the course of your life, you will ingest atoms once breathed by Hitler and Buddha, Newton and Socrates, atoms that once formed the body and the blood of Christ.

This is how we are assembled. Atoms combine to form molecules, which in turn combine to form cells, the fundamental units of life. Cells group together to form tissues. Tissues assemble to form organs: heart, lungs, spleen, stomach, pancreas, kidneys, liver, skin, bones, intestines, bladder, sex organs, eyes and brain. You are a complex machine. Your heart is a pump. Your stomach is a fuel processor. Your brain, an electrochemical supercomputer (of sorts), is the machine's control centre, regulating internal processes and guiding outwardly observable movements of limbs, torso, head and face. We also think of the brain (it thinks of *itself*) as the organ of mind. Everything you do, say,

think and feel can be traced back to brain activity. It's debatable whether brain function alone is sufficient to account for mental life (there are brain/body and body/world interactions to consider) but it is most certainly *necessary*. No brain, no mind. When he was about five years old, my son Tom asked me, *Daddy, what's inside your head?* A brain, I told him. *What's inside that?* Just brain stuff, I said. *What's that like?* It's a bit like porridge. *Oh,* he said, and carried on pummelling his Play-Doh.

Neuropsychology is the study of the relation between brain and mind. We know what the brain is. It's an organ located in the head. But what is the mind? As a neuropsychologist, my approach was a practical one. For clinical purposes, I treated the mind as a confederation of processes: perception, emotion, reason, language and memory, each faculty with its own further subdivisions. The mind is not a monolith. It is, to use the jargon, *modular*. You sometimes find severe malfunction in one mental domain alongside normal operation in others. This is because, despite considerable overlap and interconnection, different brain systems serve different psychological functions. For example, reading impairments (alexia) are neurologically dissociable from writing impairments (agraphia). Some people lose the ability to read but can still write, and vice versa. Likewise, memory for words is distinct from memory for faces, and memory for places relies on yet other circuits. And so on.

So there we have the brain and the mind, but what of the self and the soul? This takes us a step further into the storytelling zone, into the realms of imagination. The Victorian artist Samuel Palmer said a picture was 'something between a thing and a thought'. The same can be said of a person. Paintings and human bodies are physical objects that can be weighed, measured and analysed in different ways,

structurally, chemically, and so on. But in each case the material form is only a part of what we see. When we look at a picture, Palmer's *Cornfield by Moonlight*, say, it's not the paper, the paint, the ink and varnish we see. It's not just the depiction of a man and his dog in a wheat field under the light of the waxing crescent moon and the evening star. We are transported beyond the physical and the literal into the numinous, into a world of gods and spirits. Something similar happens when we look at one another. We can't help it, even if we don't believe in gods and spirits.

Sometimes I saw Kate even though she wasn't there. Nothing spooky. I would catch something of her smile in another woman's smile, or hear her in someone else's voice or laughter. It didn't happen often but when it did it was oddly comforting. Once, I followed a woman to the end of the street because she had Kate's figure and walk and wore the kind of clothes that Kate would wear. For a minute or two I had the sense that she was still alive. I could catch up with her and we would carry on as normal. The woman turned left at the end of the street and I turned right, and I went home, spirits lifted, just a little.

Autotopagnosia

Dr J. M. Carter,
Consultant Neurologist,
SJUH

27 July 1989

Dear James

Re: Mr Frank Slater, dob 09/04/14; 22 Bartholomew Road, Leeds

Thank you for referring this very pleasant 75-year-old gentleman for neuropsychological assessment. Full report attached.

Key points: Mr Slater presented with a 9–12 month history of cognitive decline, characterized by forgetfulness, word-finding difficulties and intermittent episodes of confusion. I found evidence of some moderate decline of verbal intellectual capacity, in the context of intact nonverbal function, although this is hard to evaluate given his dysphasia. The same verbal/nonverbal disparity was also found in the memory domain.

The overall pattern does not fit with a dementia of the Alzheimer type. My hunch is that the underlying cause is vascular. Most strikingly, Mr Slater is showing clear signs of autotopagnosia [body-part misidentification] which probably implicates the posterior left hemisphere. This is something you might want to investigate further.

Best wishes,
Yours sincerely,

Paul
Dr Paul Broks
Clinical Neuropsychologist

I ask my students if they've had any thoughts about what Frank's problem might be. I'm not expecting much but sometimes they surprise me. So, any thoughts? There's a long silence before a young woman, the talkative one, raises her hand. You can probably count Alzheimer's out, she says. Because? Because his recognition memory and his new learning and recall are better than you'd expect, at least for visual stuff. She makes the valid point that verbal memory is hard to assess because of Frank's word-finding problems, and the same goes for general verbal IQ. But his performance IQ, his nonverbal intelligence, appears to be at a good average level, which would be consistent with estimates of his pre-morbid ability. So, I summarize, as far as we can tell, there's no overall decline of memory or general intellectual function of the sort you might expect with a dementia. Silent assent. Right, so far, so good. Now what about the problem he has identifying parts of his body? Where does that take us? Someone else chips in, a guy who never says a word, and he's done his homework. It's called *autotopagnosia*, he says, and it's usually caused by problems in the parietal lobe. Which one? *Left*.

So, how do we read this? Well, I say, answering my own question, it's an indication that we might be dealing with something quite localized here, and you might be thinking of a tumour or a stroke, but there's nothing on the scans to indicate either of those, just a bit of cortical atrophy, not much, probably just age-related. So, it's shaping up as something that isn't a typical dementia, or a typical stroke or tumour, but it's causing serious problems for this man and it isn't getting any better. Present tense. Frank returns to life in these sessions.

I project a PowerPoint illustration of the brain's blood supply to indicate the location of Frank's problem, which is

an arterial narrowing, a *stenosis*, in the left vertebrobasilar system at the back of the head, causing a relatively slight, but evidently significant, reduction in the blood supply to the posterior left hemisphere. It's not the sort of thing that would show up on a standard CT scan, which is all he's had up to now. The thing is, I explain, it's a condition which, unlike dementia, is potentially curable. They're all ears now. They've got to like Frank, and they're rooting for him. It's possible to treat this condition surgically with a procedure known as an endarterectomy, which is an operation to remove the stuff clogging up the artery so as to get the blood flowing normally again.

They want the denouement and, for a second, I'm tempted to give the Hollywood ending, but I never do. So, I explain, with someone Frank's age, seventy-five, it's not that straightforward. Seventy-five's quite old for this type of surgery. The surgeon has to be persuaded he's fit enough to undergo the operation and, obviously, Frank has to want to go through with it in the first place. Well, it turns out he is fit enough. He's ex-army and he's kept himself in good physical shape, but he's not keen on the idea at first. Dead against, in fact. I don't know why. He didn't have the words to explain. But, anyway, he's offered the operation and he gives it some thought, and decides he will go through with it after all. So, he goes through all the pre-op assessments and he's admitted to hospital, all set to go, but on the morning of the operation he changes his mind. He discharges himself at the very last minute. I still can't say why. Just didn't fancy it, I suppose.

I sense their disappointment. You know, I tell them, I have to admit I was pretty pissed off with him at the time. I had no right to be, it was his decision, but I was. Frank, you stubborn old bugger, I thought, *come on!* You've come through all these assessments – psychological, medical, four-vessel

angiography and all – and you're nearly there. One last step, and it could really make all the difference. He was sat in a side room on the ward in his suit and tie with the regimental tiepin, ready to go home. I tried to persuade him, gently, professionally, keeping my frustration to myself, but he wouldn't budge. And I could see in his eyes, *just leave me alone, will you?* So home he went. And then his problems got worse and a few months later he had a massive stroke, and another one a few months after that, and that was it.

I gather my stuff and tell them, next week, we're going to be discussing an interesting case of anarchic hand syndrome. That's when a person's hand seems to act of its own accord, against their will, as if it has a mind of its own.

Snapshots

My father, who was forever hammering and fixing things and making stuff, made himself a photographic enlarger. He took up photography after losing an eye in an industrial accident, an experience that left him with an acute sense of both the wonder and the fragility of vision. The camera, for him, was as much a tool for intensifying the process of looking as for recording images. Bathed in red light, I would stand and he would stoop in the cramped, makeshift darkroom under the stairs. I slid papers into the developing tray and was transfixed by the images appearing from nowhere: misty woods, spiders' webs, wet cobblestones, wrinkled old faces. I had some notion of the physics and chemistry of the process, and the technology, but it still felt like conjuring spirits, a fusion of magic and science.

My dad had a talent for portraiture and took a beautiful black-and-white photograph of Kate when she was in her early twenties, not long after we'd met. I can't find it. It's not where I thought it might be, among the other mounted pictures, the factories, the frozen ponds, the pipe-smoking policeman. I have, though, stumbled upon a batch of six-by-four snapshots. I tip them out of their shoebox and spread them across the carpet. There's a fat baby stuffing its face; two small boys in a tin tub; a boy standing next to a Christmas tree. Six months? Four years? Five or six? Ages are approximate. Most of the photos are undated. Moving on, there's a boy in football strip (Wolverhampton Wanderers) with the studs of his Top Dog football boots resting on a

being there. I don't remember my little brother washing my hair in the tub. I scarcely even remember my first day at school, although there I am in blazer and cap. I have no memory of lying like that in front of the fire with notebook and biro. There are well-rehearsed, generic memories of such things, long since woven into the fabric of 'me', but the 'I' of subjective experience is disconnected from the story. Even when specific memories seep through I can't always be sure they're reliable. The Swiss psychologist Jean Piaget remembered being the victim of a kidnap attempt as a small child. He recalled sitting in his baby carriage and witnessing the struggle between his nurse and the would-be kidnapper. He saw the scratches on her face and he saw the man being chased away by a policeman with a short cape and white baton. The event became a vivid paragraph in the Piaget life story, illustrated with rich visual imagery. Years later the nurse confessed to fabricating the entire episode. Did I witness the puppy dog being crushed under the wheels of a car, or is that someone else's story? I don't know.

Roberta and her two sisters spent an afternoon going over old photographs. How could she deny they were her sisters? There they were, together on the beach building sandcastles. There they were at Roberta's birthday party, nine candles on the cake. There they were, all smiles, nestled in their father's arms. How could she deny she was Roberta? She did not, but nor could she quite accept it. Three months into the amnesia her father fell ill and died. She had got to know the man and had grown quite fond of him, but she shed no tears at the funeral.

The phone rings. It's my brother, Pete. I tell him about the photographs. I remind him of the two of us sharing the tin tub. Then there's the picture of us sitting on the kitchen table playing banjo and accordion. Here we are on Bonfire Night

trapped in rings of sparks. *Remember, remember*. There's the one of us in the river the day he nearly drowned. They illustrate my story, our story, but what does it mean to remember other than to recount the tale? 'Not much,' he agrees. We talk about the old house, a slum with holes in the roof, a history of suicides and reputed hauntings: 13 South Street. As well as buckets to catch rainwater, the attic was still littered with the previous occupant's religious paraphernalia and relics of exorcism. We were next door to a fish-and-chip shop. The lavatory was thirty yards away across someone else's back yard. Remember? Of course he does. It's part of us. If the street hadn't been demolished, I'd be back there excavating, looking for relics of myself in the bricks and tiles and corrugated iron fences. 'I remember the carpet,' Pete says.

St Ives

We came down to Cornwall in 1999 for the total eclipse of the Sun. It was clouded out. Still, we sat on a beach and, at 11.11, the appointed time, the day went dark and the birds got agitated. Across the bay a lighthouse started flashing. A year later I took a job in Plymouth and we bought a house upriver, overlooking the wooded, western slopes of the Tamar valley. Cornwall was now our home. I loved the chill autumnal nights looking out across the valley with the stars churning overhead. The total eclipse was on the 11th of August, and it was three years later, to the day, that we discovered the lump.

One blazing midnight, out on the balcony, I'm picking out the constellations. Kate's not listening. *Cassiopeia, Pegasus, Pisces.* At least I thought she wasn't. *Perseus, Aquarius, Andromeda* ... But now I'm hearing the story of the Chained Princess, Andromeda. Her mother, Cassiopeia, declared her more beautiful than the sea-nymphs and this had really pissed Poseidon off. So, as her mother watched from the shore with bitter remorse, the god of the sea chained Andromeda to a rock and left her for the ravenous sea-monster, Cetus. But a hero, Perseus, arrived in the nick of time to save her. He happened to be passing by on his way back from decapitating Medusa the Gorgon. It was love at first sight. With the monster cutting through the waves, Perseus put the rescue on hold just long enough to observe the formality of asking Andromeda's parents for her hand in marriage, and then he slayed Cetus with his sickle or, in a

variation of the story, by holding aloft Medusa's severed head, the sight of which turned the monster to stone.

'Cetus? There, below. And, over to the left ...' I'm sharing Kate's line of sight, directing her finger, as she had directed mine to the tumour in her breast. 'That's Perseus, charging to the rescue, and that tiny smudge of light is the Andromeda galaxy.' She can't make it out. It's hard to fixate. The trick is to look fractionally to one side so that the Andromedan photons strike the periphery of the retina. That's where the cells most sensitive to dim light are located. We've digressed from mythology to astronomy, and now to anatomy, and soon she will lose interest, or, rather, patience. It's all too remote; too removed from the worries of the world. The reason for my love of the stars is precisely the reason for her indifference. I'm enthralled by the notion that this smallest, faintest celestial speck of light, captured by the rods of the retina, my retina, at the end of a two-and-a-half-million-year intergalactic journey, and channelled for analysis along the visual pathways to a remote fold of my brain, is an island universe containing a trillion stars. I'm enthralled; staggered; enchanted. Kate isn't. For her it's a cold fact. She doesn't get jazz either. So we sit in silent disjunction for a while and then she says, 'I'm dying. All this will go on without me.'

The days between the discovery of the lump and the diagnosis of cancer were dismal because I knew in my bones what the diagnosis would be. A fog rolled up from the Tamar and wouldn't shift. It was almost a relief when the bad news came and we could get on with doing something about it. The sun was shining again. A couple of days after the bad news we drove with the boys from our home in the east of Cornwall to the seaside town of St Ives in the west. We sat watching the breakers crashing onto the sands of Porthmeor beach. We swam, we ate fresh fish at the Seafood Café, and we enjoyed