

I was six years old when my parents told me that there was a small, dark jewel inside my skull, learning to be me.

Microscopic spiders had woven a fine golden web through my brain, so that the jewel's teacher could listen to the whisper of my thoughts. The jewel itself eavesdropped on my senses, and read the chemical messages carried in my bloodstream; it saw, heard, smelt, tasted and felt the world exactly as I did, while the teacher monitored its thoughts and compared them with my own. Whenever the jewel's thoughts were *wrong*, the teacher—faster than thought—rebuilt the jewel slightly, altering it this way and that, seeking out the changes that would make its thoughts correct.

Why? So that when I could no longer be me, the jewel could do it for me.

I thought: if hearing that makes *me* feel strange and giddy, how must it make the *jewel* feel? Exactly the same, I reasoned; it doesn't know it's the jewel, and it too wonders how the jewel must feel, it too reasons: 'Exactly the same; it doesn't know it's the jewel, and it too wonders how the jewel must feel . . .'

And it too wonders—

(I knew, because *I* wondered)

—it too wonders whether it's the real me, or whether in fact it's only the jewel that's learning to be me.

As a scornful twelve-year-old, I would have mocked such childish concerns. Everybody had the jewel, save the members of obscure religious sects, and dwelling upon the strangeness of it struck me as unbearably pretentious. The jewel was the jewel, a mundane fact of life, as ordinary as excrement. My friends and I told bad jokes about it, the same way we told bad jokes about sex, to prove to each other how blasé we were about the whole idea.

Yet we weren't quite as jaded and imperturbable as we pretended to be. One day when we were all loitering in the park, up to nothing in particular, one of the gang—whose name I've forgotten, but who has stuck in my mind as always being far too clever for his own good—asked each of us in turn: 'Who *are* you? The

jewel, or the real human?' We all replied—unthinkingly, indignantly—'The real human!' When the last of us had answered, he cackled and said, 'Well, I'm not. *I'm* the jewel. So you can eat my shit, you losers, because *you'll* all get flushed down the cosmic toilet—but me, I'm gonna live forever.'

We beat him until he bled.

By the time I was fourteen, despite—or perhaps because of—the fact that the jewel was scarcely mentioned in my teaching machine's dull curriculum, I'd given the question a great deal more thought. The pedantically correct answer when asked 'Are you the jewel or the human?' had to be 'The human'—because only the human brain was physically able to reply. The jewel received input from the senses, but had no control over the body, and its intended reply coincided with what was actually said only because the device was a perfect imitation of the brain. To tell the outside world 'I am the jewel'—with speech, with writing, or with any other method involving the body—was patently false (although to *think it* to oneself was not ruled out by this line of reasoning).

However, in a broader sense, I decided that the question was simply misguided. So long as the jewel and the human brain shared the same sensory input, and so long as the teacher kept their thoughts in perfect step, there was only *one* person, *one* identity, *one* consciousness. This one person merely happened to have the (highly desirable) property that *if either* the jewel *or* the human brain were to be destroyed, he or she would survive unimpaired. People had always had two lungs and two kidneys, and for almost a century, many had lived with two hearts. This was the same: a matter of redundancy; a matter of robustness, no more.

That was the year that my parents decided I was mature enough to be told that they had both undergone the switch—three years before. I pretended to take the news calmly, but I hated them passionately for not having told me at the time. They had disguised their stay in hospital with lies about a business trip overseas. For three years I had been living with jewel-heads,

and they hadn't even told me. It was *exactly* what I would have expected of them.

'We didn't seem any different to you, did we?' asked my mother.

'No,' I said—truthfully, but burning with resentment nonetheless.

'That's why we didn't tell you,' said my father. 'If you'd known we'd switched, at the time, you might have *imagined* that we'd changed in some way. By waiting until now to tell you, we've made it easier for you to convince yourself that we're still the same people we've always been.' He put an arm around me and squeezed me. I almost screamed out, 'Don't *touch* me!' but I remembered in time that I'd convinced myself that the jewel was No Big Deal.

I should have guessed that they'd done it, long before they confessed; after all, I'd known for years that most people underwent the switch in their early thirties. By then, it's downhill for the organic brain, and it would be foolish to have the jewel mimic this decline. So, the nervous system is rewired; the reins of the body are handed over to the jewel, and the teacher is deactivated. For a week, the outward-bound impulses from the brain are compared with those from the jewel, but by this time the jewel is a perfect copy, and no differences are ever detected.

The brain is removed, discarded, and replaced with a spongy tissue-cultured object, brain-shaped down to the level of the finest capillaries, but no more capable of thought than a lung or a kidney. This mock-brain removes exactly as much oxygen and glucose from the blood as the real thing, and faithfully performs a number of crude, essential biochemical functions. In time, like all flesh, it will perish and need to be replaced.

The jewel, however, is immortal. Short of being dropped into a nuclear fireball, it will endure for a billion years.

My parents were machines. My parents were gods. It was nothing special. I hated them.

When I was sixteen, I fell in love, and became a child again.

Spending warm nights on the beach with Eva, I couldn't believe that a mere machine could ever feel the way I did. I knew full well that if my jewel had been given control of my body, it would have spoken the very same words as I had, and executed with equal tenderness and clumsiness my every awkward caress—but I couldn't accept that its inner life was as rich, as miraculous, as joyful as mine. Sex, however pleasant, I could accept as a purely mechanical

function, but there was something between us (or so I believed) that had nothing to do with lust, nothing to do with words, nothing to do with any tangible action of our bodies that some spy in the sand dunes with parabolic microphone and infrared binoculars might have discerned. After we made love, we'd gaze up in silence at the handful of visible stars, our souls conjoined in a secret place that no crystalline computer could hope to reach in a billion years of striving. (If I'd said *that* to my sensible, smutty, twelve-year-old self, he would have laughed until he haemorrhaged.)

I knew by then that the jewel's 'teacher' didn't monitor every single neuron in the brain. That would have been impractical, both in terms of handling the data, and because of the sheer physical intrusion into the tissue. Someone-or-other's theorem said that sampling certain critical neurons was almost as good as sampling the lot, and—given some very reasonable assumptions that nobody could disprove—bounds on the errors involved could be established with mathematical rigour.

At first, I declared that *within these errors*, however small, lay the difference between brain and jewel, between human and machine, between love and its imitation. Eva, however, soon pointed out that it was absurd to make a radical, qualitative distinction on the basis of the sampling density; if the next model teacher sampled more neurons and halved the error rate, would its jewel then be 'half-way' between 'human' and 'machine'? In theory—and eventually, in practice—the error rate could be made smaller than any number I cared to name. Did I really believe that a discrepancy of one in a billion made any difference at all—when every human being was permanently losing thousands of neurons every day, by natural attrition?

She was right, of course, but I soon found another, more plausible, defence for my position. Living neurons, I argued, had far more internal structure than the crude optical switches that served the same function in the jewel's so-called 'neural net.' That neurons fired or did not fire reflected only one level of their behaviour; who knew what the subtleties of biochemistry—the quantum mechanics of the specific organic molecules involved—contributed to the nature of human consciousness? Copying the abstract neural topology wasn't enough. Sure, the jewel could pass the fatuous Turing test—no outside observer could tell it from a human—but that didn't prove that *being* a jewel felt the same as *being* human.

Eva asked, 'Does that mean you'll never switch? You'll have your jewel removed? You'll let yourself *die* when your brain starts to rot?'

'Maybe,' I said. 'Better to die at ninety or a hundred than kill myself at thirty, and have some machine marching around, taking my place, pretending to be me.'

'How do you know *I* haven't switched?' she asked, provocatively. 'How do you know that I'm not just 'pretending to be me?'

'I know you haven't switched,' I said, smugly. 'I just *know*.'

'How? I'd look the same. I'd talk the same. I'd act the same in every way. People are switching younger, these days. *So how do you know I haven't?*'

I turned onto my side towards her, and gazed into her eyes. 'Telepathy. Magic. The communion of souls.'

My twelve-year-old self started snickering, but by then I knew exactly how to drive him away.

At nineteen, although I was studying finance, I took an undergraduate philosophy unit. The Philosophy Department, however, apparently had nothing to say about the Ndoli Device, more commonly known as 'the jewel.' (Ndoli had in fact called it 'the *dual*,' but the accidental, homophonic nick-name had stuck.) They talked about Plato and Descartes and Marx, they talked about St. Augustine and—when feeling particularly modern and adventurous—Sartre, but if they'd heard of Godel, Turing, Hamsun, or Kim, they refused to admit it. Out of sheer frustration, in an essay on Descartes I suggested that the notion of human consciousness as 'software' that could be 'implemented' equally well on an organic brain or an optical crystal was in fact a throwback to Cartesian dualism: for 'software' read 'soul.' My tutor superimposed a neat, diagonal, luminous red line over each paragraph that dealt with this idea, and wrote in the margin (in vertical, bold-face, 20-point Times, with a contemptuous 2 Hertz flash): **IRRELEVANT!**

I quit philosophy and enrolled in a unit of optical crystal engineering for non-specialists. I learnt a lot of solid-state quantum mechanics. I learnt a lot of fascinating mathematics. I learnt that a neural net is a device used only for solving problems that are far too hard to be *understood*. A sufficiently flexible neural net can be configured by feedback to mimic almost any system—to produce the same patterns of output from the same patterns of input—but achieving

this sheds no light whatsoever on the nature of the system being emulated.

'Understanding,' the lecturer told us, 'is an overrated concept. Nobody really *understands* how a fertilized egg turns into a human. What should we do? Stop having children until ontogenesis can be described by a set of differential equations?'

I had to concede that she had a point there.

It was clear to me by then that nobody had the answers I craved—and I was hardly likely to come up with them myself; my intellectual skills were, at best, mediocre. It came down to a simple choice: I could waste time fretting about the mysteries of consciousness, or, like everybody else, I could stop worrying and get on with my life.

When I married Daphne, at twenty-three, Eva was a distant memory, and so was any thought of the communion of souls. Daphne was thirty-one, an executive in the merchant bank that had hired me during my Ph.D., and everyone agreed that the marriage would benefit my career. What she got out of it, I was never quite sure. Maybe she actually liked me. We had an agreeable sex life, and we comforted each other when we were down, the way any kind-hearted person would comfort an animal in distress.

Daphne hadn't switched. She put it off, month after month, inventing ever more ludicrous excuses, and I teased her as if I'd never had reservations of my own.

'I'm afraid,' she confessed one night. 'What if I die when it happens—what if all that's left is a robot, a puppet, a *thing*? I don't want to *die*.'

Talk like that made me squirm, but I hid my feelings. 'Suppose you had a stroke,' I said glibly, 'which destroyed a small part of your brain. Suppose the doctors implanted a machine to take over the functions which that damaged region had performed. Would you still be 'yourself'?'

'Of course.'

'Then if they did it twice, or ten times, or a thousand times —'

'That doesn't necessarily follow.'

'Oh? At what magic percentage, then, would you stop being 'you'?''

She glared at me. 'All the old clichéd arguments —'

'Fault them, then, if they're so old and clichéd.'

She started to cry. 'I don't have to. Fuck you! I'm scared to death, and you don't give a shit!'

I took her in my arms. 'Sssh. I'm sorry. But everyone does it sooner or later. You mustn't be afraid. I'm here. I love you.' The words might

have been a recording, triggered automatically by the sight of her tears.

'Will you do it? With me?'

I went cold. 'What?'

'Have the operation, on the same day? Switch when I switch?'

Lots of couples did that. Like my parents. Sometimes, no doubt, it was a matter of love, commitment, sharing. Other times, I'm sure, it was more a matter of neither partner wishing to be an unswitched person living with a jewel-head.

I was silent for a while, then I said, 'Sure.'

In the months that followed, all of Daphne's fears—which I'd mocked as 'childish' and 'superstitious'—rapidly began to make perfect sense, and my own 'rational' arguments came to sound abstract and hollow. I backed out at the last minute; I refused the anaesthetic, and fled the hospital.

It won't be easy. He met a woman on the beach, the day I came into being. Her name is Cathy. They've slept together three times, and he thinks he loves her. Or at least, he's said it to her face, he's whispered it to her while she slept, he's written it, true or false, into his diary.

I feel nothing for her. She's a nice enough person, I'm sure, but I hardly know her. Preoccupied with my plight, I've paid scant attention to her conversation, and the act of sex was, for me, little more than a distasteful piece of involuntary voyeurism. Since I realised what was at stake, I've *tried* to succumb to the same emotions as my alter ego, but how can I love her when communication between us is impossible, when she doesn't even know I exist?

If she rules his thoughts night and day, but is nothing but a dangerous obstacle to me, how can I hope to achieve the flawless imitation that will enable me to escape death?

He's sleeping now, so I must sleep. I listen to his heartbeat, his slow breathing, and try to achieve a tranquillity consonant with these rhythms. For a moment, I am discouraged. Even my *dreams* will be different; our divergence is ineradicable, my goal is laughable, ludicrous, pathetic. Every nerve impulse, for a week? My fear of detection and my attempts to conceal it will, unavoidably, distort my responses; this knot of lies and panic will be impossible to hide.

Yet as I drift towards sleep, I find myself believing that I *will* succeed. I *must*. I dream for a while—a confusion of images, both strange and mundane, ending with a grain of salt passing through the eye of a needle—then I tumble, without fear, into dreamless oblivion.

I stare up at the white ceiling, giddy and confused, trying to rid myself of the nagging conviction that there's something I *must* not think about.

Then I clench my fist gingerly, rejoice at this miracle, and remember.

Up until the last minute, I thought he was going to back out again—but he didn't. Cathy talked him through his fears. Cathy, after all, has switched, and he loves her more than he's ever loved anyone before.

So, our roles are reversed now. This body is *his* strait-jacket, now . . .

I am drenched in sweat. *This is hopeless, impossible.* I can't read his mind, I can't guess what he's trying to do. Should I move, lie still, call out, keep silent? Even if the computer monitoring us is programmed to ignore a few trivial discrepancies, as soon as he notices that his body won't carry out his will, he'll panic just as I did, and I'll have no chance at all of making the right guesses. Would *he* be sweating, now? Would *his* breathing be constricted, like this? *No.* I've been awake for just thirty seconds, and already I have betrayed myself. An optical-fibre cable trails from under my right ear to a panel on the wall. Somewhere, alarm bells must be sounding.

If I made a run for it, what would they do? Use force? I'm a citizen, aren't I? Jewel-heads have had full legal rights for decades; the surgeons and engineers can't do anything to me without my consent. I try to recall the clauses on the waiver he signed, but he hardly gave it a second glance. I tug at the cable that holds me prisoner, but it's firmly anchored, at both ends.

When the door swings open, for a moment I think I'm going to fall to pieces, but from somewhere I find the strength to compose myself. It's my neurologist, Dr Prem. He smiles and says, 'How are you feeling? Not too bad?'

I nod dumbly.

'The biggest shock, for most people, is that they don't feel different at all! For a while you'll think, 'It can't be this simple! It can't be this easy! It can't be this *normal!*' But you'll soon come to accept that *it is*. And life will go on, unchanged.' He beams, taps my shoulder paternally, then turns and departs.

Hours pass. *What are they waiting for?* The evidence must be conclusive by now. Perhaps there are procedures to go through, legal and technical experts to be consulted, ethics committees to be assembled to deliberate on my fate. I'm soaked in perspiration, trembling uncontrollably. I grab the cable several times and

yank with all my strength, but it seems fixed in concrete at one end, and bolted to my skull at the other.

An orderly brings me a meal. 'Cheer up,' he says. 'Visiting time soon.'

Afterwards, he brings me a bedpan, but I'm too nervous even to piss.

Cathy frowns when she sees me. 'What's wrong?'

I shrug and smile, shivering, wondering why I'm even trying to go through with the charade. 'Nothing. I just . . . feel a bit sick, that's all.'

She takes my hand, then bends and kisses me on the lips. In spite of everything, I find myself instantly aroused. Still leaning over me, she smiles and says, 'It's over now, okay? There's nothing left to be afraid of. You're a little shook up, but you know in your heart you're still who you've always been. And I love you.'

I nod. We make small talk. She leaves. I whisper to myself, hysterically, 'I'm still who I've always been. I'm still who I've always been.'

Yesterday, they scraped my skull clean, and inserted my new, non-sentient, space-filling mock-brain.

I feel calmer now than I have for a long time, and I think at last I've pieced together an explanation for my survival.

Why do they deactivate the teacher, for the week between the switch and the destruction of the brain? Well, they can hardly keep it running while the brain is being trashed—but why an entire week? To reassure people that the jewel, unsupervised, can still stay in synch; to persuade them that the life the jewel is going to live will be exactly the life that the organic brain 'would have lived'—whatever that could mean.

Why, then, only for a week? Why not a month, or a year? Because the jewel *cannot* stay in synch for that long—not because of any flaw, but for precisely the reason that makes it worth using in the first place. The jewel is immortal. The brain is decaying. The jewel's imitation of the brain leaves out—deliberately—the fact that *real* neurons *die*. Without the teacher working to contrive, in effect, an identical deterioration of the jewel, small discrepancies must eventually arise. A fraction of a second's difference in responding to a stimulus is enough to arouse suspicion, and—as I know too well—from that moment on, the process of divergence is irreversible.

No doubt, a team of pioneering neurologists sat huddled around a computer screen, fifty years ago, and contemplated a graph

of the probability of this radical divergence, versus time. How would they have chosen *one week*? What probability would have been acceptable? A tenth of a percent? A hundredth? A thousandth? However safe they decided to be, it's hard to imagine them choosing a value low enough to make the phenomenon rare on a global scale, once a quarter of a million people were being switched every day.

In any given hospital, it might happen only once a decade, or once a century, but every institution would still need to have a policy for dealing with the eventuality.

What would their choices be?

They could honour their contractual obligations and turn the teacher on again, erasing their satisfied customer, and giving the traumatised organic brain the chance to rant about its ordeal to the media and the legal profession.

Or, they could quietly erase the computer records of the discrepancy, and calmly remove the only witness.

So, this is it. Eternity.

I'll need transplants in fifty or sixty years' time, and eventually a whole new body, but that prospect shouldn't worry me—I can't die on the operating table. In a thousand years or so, I'll need extra hardware tacked on to cope with my memory storage requirements, but I'm sure the process will be uneventful. On a time scale of millions of years, the structure of the jewel is subject to cosmic-ray damage, but error-free transcription to a fresh crystal at regular intervals will circumvent that problem.

In theory, at least, I'm now guaranteed either a seat at the Big Crunch, or participation in the heat death of the universe.

I ditched Cathy, of course. I might have learnt to like her, but she made me nervous, and I was thoroughly sick of feeling that I had to play a role.

As for the man who claimed that he loved her—the man who spent the last week of his life helpless, terrified, suffocated by the knowledge of his impending death—I can't yet decide how I feel. I ought to be able to empathise—considering that I once expected to suffer the very same fate myself—yet somehow he simply isn't *real* to me. I know my brain was modelled on his—giving him a kind of causal primacy—but in spite of that, I think of him now as a pale, insubstantial shadow.

After all, I have no way of knowing if his sense of himself, his deepest inner life, his experience of *being*, was in any way comparable to my own.