SPRING BOOKS

A strange sense of self

Am I a mirage?

I Am a Strange Loop
by Douglas R. Hofstadter
Basic Books: 2007. 384 pp. $26.95, £14.99

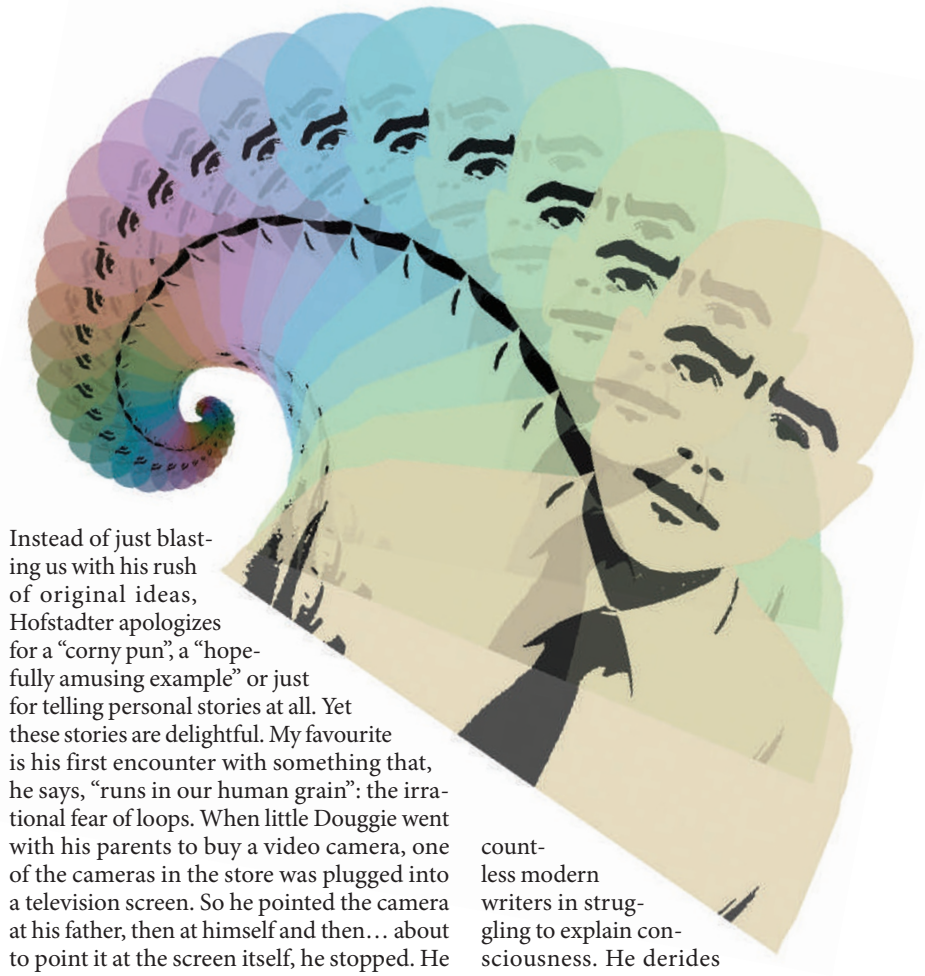
Susan Blackmore

Who is this 'I'? Is it the author? Is it the reader? Could it be the sentence itself (would that work)? Readers of Douglas Hofstadter's best-seller *Gödel, Escher, Bach* (Basic Books, 1979) will be familiar with such twisty questions, and will probably delight in the pain, mental squirming and occasional wondrous resolution that they provoke. But whereas *Gödel, Escher, Bach* conjured myriad mysteries, *I Am a Strange Loop* tends rather to explain them, and the result is less magical and even slightly awkward.

At one level (and this is a deeply multilayered work) the book pulls off some remarkable achievements. For example, in a matter of 40 readable, and even enjoyable, pages, Hofstadter manages to explain Kurt Gödel's incompleteness theorem in a way I have never seen attempted before. We are taken from "the gloomy, austere, supposedly paradox-proof castle" of Alfred North Whitehead and Bertrand Russell's great work *Principia Mathematica* (containing the formal system that Hofstadter calls 'PM'), through ways of mapping numbers onto theorems and hunting for patterns among squares, primes and 'prims' (Hofstadter's name for theorems that are provable in PM), to sentences that talk about themselves and so, finally, to make sense of a concise English translation of Gödel's formula (the paradigmatic strange loop), "I am not provable in PM." Wow! I really felt I learnt a lot.

Hofstadter speculates that Russell never saw the second level of meaning (the effect of mapping numbers onto theorems) in his great work, like a dog that sees a television screen as a mass of changing pixels, or a child who sees the people on the screen but fails to grasp the romantic plot. And then he whisks us away to tangle with ever more layers of paradox and wonderfully mind-wrenching questions. What is the nature of mathematical truth? What is the nature of meaning? Could a machine be confused? Could it know it was confused? Could it believe that its unquestioned belief in the reality of its own 'I' is a necessary illusion?

Along the way, Hofstadter talks about himself, but his pacy mix of stories, metaphors, questions and explanations is sometimes spoiled by what seems like a lack of confidence.



ILLUSTRATIONS BY JOE MAGEE

Instead of just blasting us with his rush of original ideas, Hofstadter apologizes for a "corny pun", a "hopefully amusing example" or just for telling personal stories at all. Yet these stories are delightful. My favourite is his first encounter with something that, he says, "runs in our human grain": the irrational fear of loops. When little Douggie went with his parents to buy a video camera, one of the cameras in the store was plugged into a television screen. So he pointed the camera at his father, then at himself and then… about to point it at the screen itself, he stopped. He remembers with shame that he was hesitant to close the loop. So he timidly asked the salesperson whether he might and was told: "No, no — you'll break the camera!"

He then convinced himself that this couldn't possibly be true, and went home to experiment with video feedback, finite and infinite regresses, corridors with curves or corners, and a completely unexpected pattern with precisely 13 (a prime number, of course) spokes.

A sadder event, the discovery of his baby sister's brain damage, began his fascination with the physical basis of consciousness. At the age of 12 or so, it dawned on him that consciousness is a peculiar kind of mirage that perceives itself and yet doesn't believe it's perceiving a mirage. This insight leads directly to the stated aim of this book: to try to pinpoint that "special kind of subtle pattern" that underlies, or gives rise to the 'soul', the 'I', 'having a light on inside' or 'being conscious'.

This is a grand aim, and Hofstadter joins countless modern writers in struggling to explain consciousness. He derides zombies and qualia, has harsh words for philosophers David Chalmers and John Searle, and skilfully sweeps away all sorts of nonsense, from old-fashioned kinds of dualism to the more prevalent belief that consciousness is still something 'extra' — an *élan mental*. Instead, he argues that the self is a strange loop that automatically arises in a machine with a sufficiently sophisticated repertoire of categories. It is a myth, a mirage, like a satellite to your brain whose resident strange loop decides that 'here' is wherever that brain happens to be. And, he claims, once you have explained the self, you have explained consciousness.

Herein lies the source of my dissatisfaction. The idea of the self as a strange loop makes sense of moments of self-awareness and of baffled self-inquiry — but what about the rest of the time? The theory seems to imply that mostly we are not conscious at all, which may well be right, but Hofstadter does not discuss this. Then there are those profound moments

of utter stillness or absorbed flow when the self is in abeyance. People describe these as being clearer than ordinary consciousness, but this cannot be explained if self and consciousness are as closely linked as Hofstadter claims. He also argues that the self loop is indispensable; this might be challenged by those who have attempted, or even managed, to let go of the illusion of self. He quotes a Zen koan that seems beautifully to point the way out of strange loops and into awareness beyond self, but he dismisses it as "just a bunch of non-sequiturs".

Hofstadter realizes that people will be dissatisfied, and provides a light-hearted debate between two numbered strange loops: himself and his opposing sceptic. I keep wondering whether I'm no better than sceptic SL #264, who really just doesn't get it, although he (it?) comes up with some classic objections.

I keep looking over at my black cat on the window sill, with her ragged fur brightly lit by the morning sun. Does it help to say that the experiencer of this vivid visual experience is a strange loop? Whatever the answer, this strange loop is enjoying the question. ■

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James Bond with a feather duster

The Canon: A Whirligig Tour of the Beautiful Basics of Science
by Natalie Angier
Houghton Mifflin: 2007. 320 pp. $27

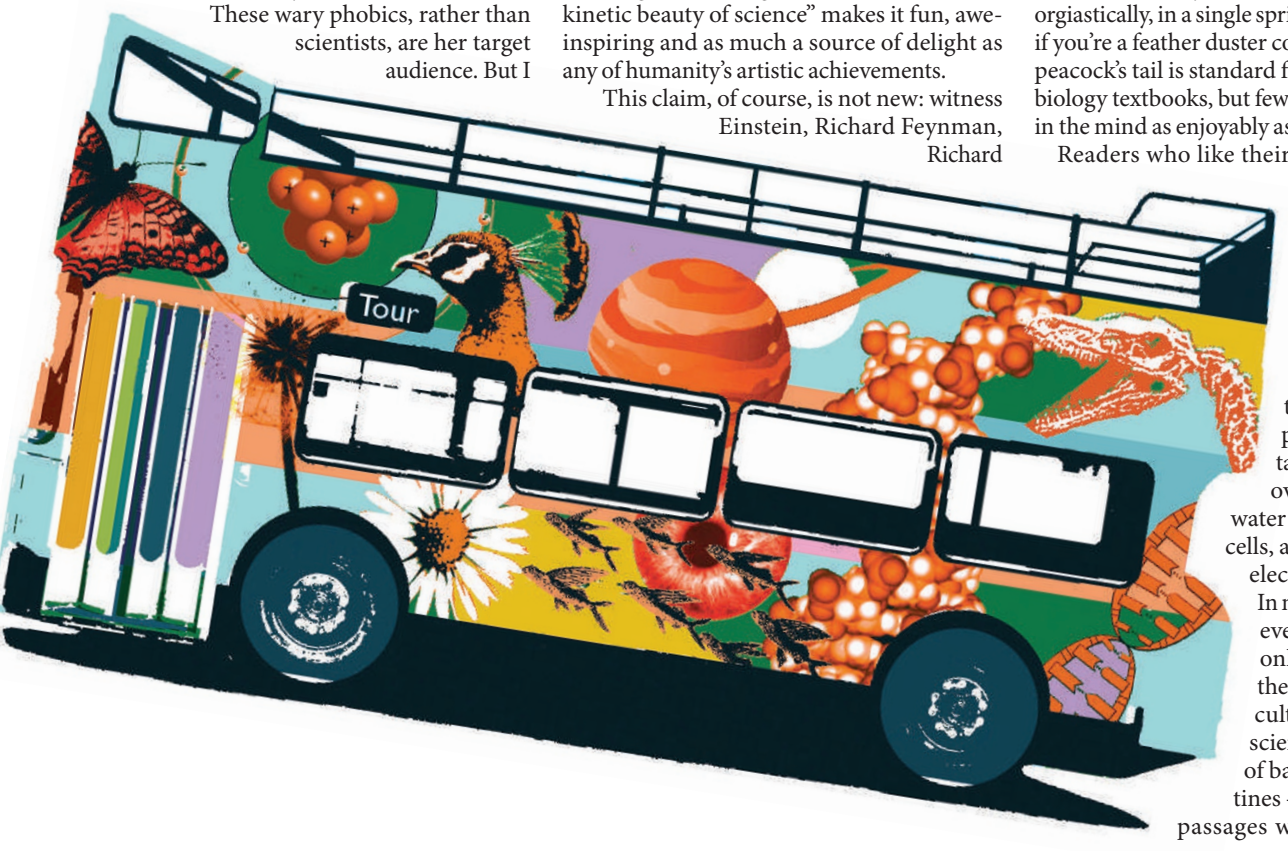
Kathleen Taylor

Natalie Angier's book *The Canon*, like many before it, sets out to persuade the public that learning about science can be enjoyable. It focuses on the 'hard' sciences, which here means physics, chemistry, evolutionary and molecular biology, geology and astronomy, together with introductory chapters on thinking scientifically, probability and issues of scale and measurement. Angier proposes that what scientists do is worth a look even for people traumatized by school science lessons. These wary phobics, rather than scientists, are her target audience. But I would also recommend *The Canon* to professionals, and to the already interested public (a sizeable constituency, as not all school science teaching is bad), because this is a remarkable and delightful book.

Angier, an accomplished, Pulitzer Prize-winning science journalist, has clearly thought carefully about the 'why bother?' challenge to science communication. She notes but does not depend on the common arguments that the importance of science makes avoiding it unjustifiable; that future national prowess requires more scientists; or that a scientifically informed public may at last learn reason and decide to put astrologers and lotteries out of business. Instead, she eschews "civic need" for "neural greed", aiming to demonstrate that "the kinetic beauty of science" makes it fun, awe-inspiring and as much a source of delight as any of humanity's artistic achievements.

This claim, of course, is not new: witness Einstein, Richard Feynman, Richard Dawkins and many others. Angier's distinction lies in her exhilarating use of language. Unlike Bill Bryson's *A Short History of Nearly Everything* (Doubleday, 2003), *The Canon* does not rely on personalities to brighten up the prose, even when exploring traditionally difficult areas of physics and chemistry. Instead, anecdotes are well chosen, humanizing without patronizing the scientists involved. Angier has no need to name-drop; her writing style holds the reader's attention. (I can vouch for this, having almost missed my stop while reading her book on the train.) For once the blurb — "playful, passionate" — is spot on: this is an astonishingly literary science book, much better written than most. Out goes pedestrian prose; in come references to every cultural form from the scriptures to movies, delicate allusions to writers from Homer and Andrew Marvell to Sigmund Freud, such words as 'accoutred', 'trocar' and 'miasmic', teasing alliterations, the occasional sharp political comment and some truly excruciating puns.

This linguistic fecundity can at times be overwhelming, especially for non-American readers, who may find some of the references baffling (Ty Cobb? Bialies? You'd best keep a search engine handy). A riff on chemical bonds by analogy to their superspy namesake James was unconvincing and somewhat distracting — if Sean Connery is covalent and Roger Moore ionic, where does that leave Daniel Craig? — but this is one of the book's few weaker moments. Elsewhere there are glories, as when Angier remarks of sexual selection in the peacock: "If you survive long enough to breed, and if you score handsomely, even orgiastically, in a single spring spree, who cares if you're a feather duster come summer?" The peacock's tail is standard fare in evolutionary biology textbooks, but few descriptions linger in the mind as enjoyably as Angier's.



Readers who like their texts spartan will loathe this one, which rarely uses one metaphor, simile, adjective or subclause where two, three or four can be squeezed in. Purists who object to anthropomorphisms should also take note: *The Canon* overflows with loyal water droplets, preening cells, anxious and fidgety electrons, and the like. In my judgement, however, the benefits — if only in counteracting the still-prevalent 'two cultures' stereotype of science as the preserve of barely literate philistines — make the purple passages worthwhile. Those