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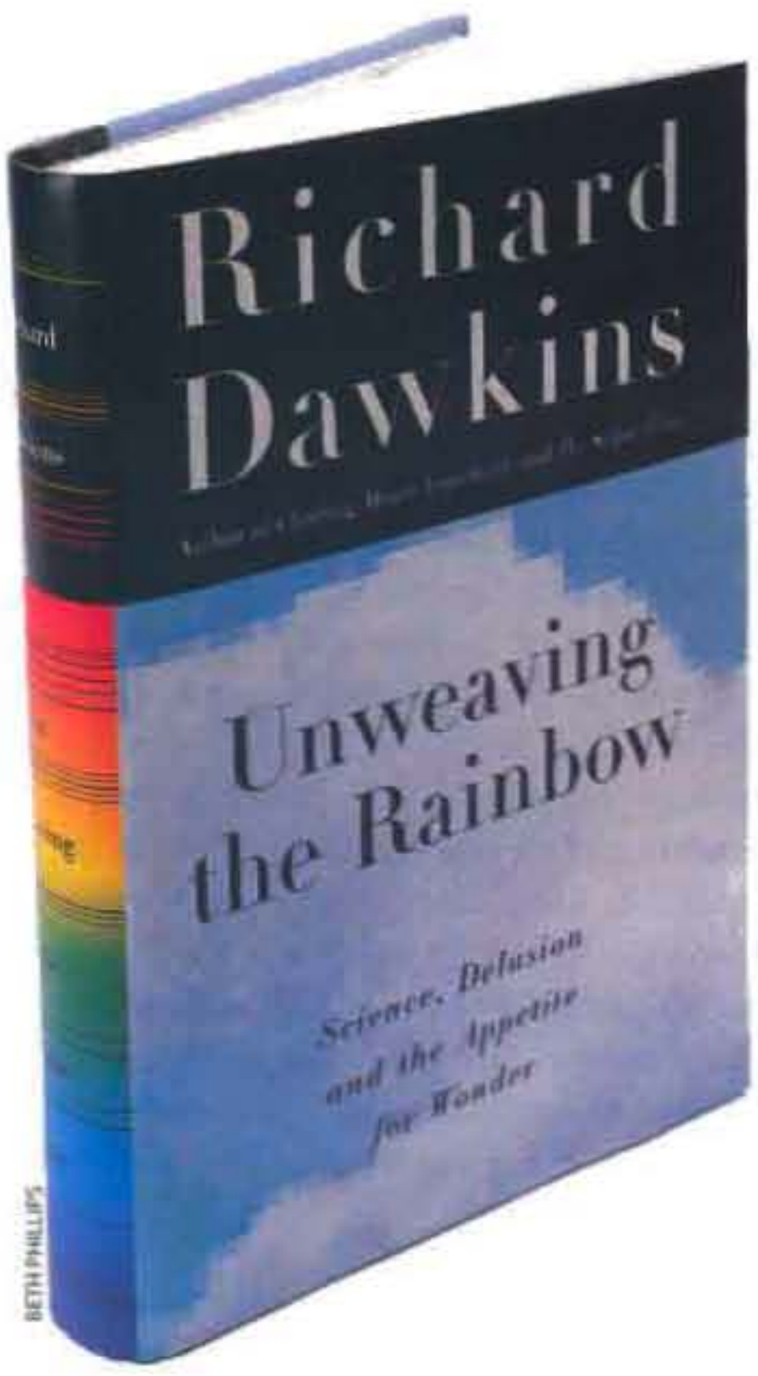
ONE MAN'S RAINBOW

Review by Melvin Konner

Unweaving the Rainbow: Science, Delusion and the Appetite for Wonder
BY RICHARD DAWKINS
Houghton Mifflin Company, Boston & New York, 1998 ($26)



When a bad writer writes a good book, we are happy to hail the new growth of talent or character. But when a good writer issues a not-so-good book, one almost feels that to express disappointment is somehow small. Richard Dawkins is a British national treasure and (because English is the international language) also the world's. He is a wizard of lively English prose and a grand master of what he has called "the explainer's art." More than any other writer, he has taught scientists and their public to appreciate metaphor. Even the titles of his books are a kind of poetry: *The Blind Watchmaker, River out of Eden, Climbing Mount Improbable.* Some of the most dunderheaded opponents of his first book, *The Selfish Gene,* seem to have read the title alone and not quite realized that it *was* a metaphor; back to English 101.

But for this book Dawkins borrows his metaphor, and it gives him his mission: "My title is from Keats, who believed that Newton had destroyed all the poetry of the rainbow by reducing it to the prismatic colors. Keats could hardly have been more wrong, and my aim is to guide all who are tempted by a similar view towards the opposite conclusion." Dawkins proceeds to challenge Keats—not to mention Blake, Wordsworth, Yeats and many lesser literary lights—to a contest that he cannot win. Keats's lament is in a poem called "Lamia":

> There was an awful rainbow once
> in heaven;
> We know her texture; she is given
> In the dull catalogue of
> common things,
> Philosophy will clip an Angel's wings,
> Conquer all mysteries by rule
> and line,
> Empty the haunted air, and gnomed
> mine
> Unweave a rainbow ...

Dawkins goes on to unweave the rainbow quite nicely, in a way that is satisfying to my curiosity (and, I would guess, that of others) but that in no sense addresses the fears Keats raised; in fact, it confirms them. Consider: "I said that light from the sun enters a raindrop through the upper quadrant of the surface facing the sun, and leaves through the lower quadrant. But of course there is nothing to stop sunlight entering the lower quadrant. Under the right conditions, it can then be reflected *twice* round the inside of the sphere, leaving the lower quadrant of the drop in such a way as to enter the observer's eye, also refracted, to produce a second rainbow, 8 degrees higher than the first and less than half as bright." Of such stuff as this Dawkins says, "I think that if Wordsworth had realized all this, he might have improved upon 'My heart leaps up when I behold/A rainbow in the sky ...'"

A long excerpt of tedious verse by a justly forgotten 18th-century poet, one Mark Akenside, has the bad luck to be on a facing page from the above instance of Keats's genius. Akenside's lines deliver a more or less Newtonian view of the rainbow, and they are very dull indeed. To demand such a view is rather like reading the Psalms and observing that hills don't skip like rams, or interpreting Mercutio's deathless reverie on Queen Mab and her retinue as a throwback to a dark age of imps and demons.

In fact, Keats cannot have been wrong, because it was not his aim to be right in any way Dawkins appears to understand. He was right in the only way he wanted to be, having found words to express the fear that Newton's prismatics inspired in him—in what he would comfortably (though, to be sure, less sublimely) have called his heart and soul. What might have made this book work would have been to start with empathy toward Keats, to attempt to resonate to his fear instead of just explaining it away.

The book's a rousing read. Those who have read Dawkins's earlier works will find some ideas repeated, even in a similar exposition, but there is still much to learn from and enjoy. There are many literary quotations, and the discussion of those sometimes rises above the pedestrian. But Dawkins is most comfortable as a polemicist, with a hair-trigger, all-guns-blazing defense of science against its detractors—whether they are great poets or newspaper columnists, princes of the church or John and Jane Q. Public—and polemics are rarely beautiful.

Readers of this magazine know beauty in science. It emerges from the unification of falling bodies with planetary orbits, of electricity with magnetism, of space with time. It crystallizes in quantum theory, the periodic table of the elements, plate tectonics, and the idea of evolution by natural selection. It emanates from the structure of DNA and from the fact that the ratio of a circle to its diameter invari-

ably produces one endlessly just-out-of-reach universal number. And yes, it is also in Newton's optics. But the beauty in science is not to be found in pages and pages of exposition of every conceivable scientific insight into rainbows, cheek by jowl with petulant criticism of the unscientific thoughts of great poets. Such exposition really does unweave the rainbow, and it suggests that Keats's fear was not unjustified.

In failing to understand such fears, Dawkins is in good company. The famously arrogant genius Richard Feynman is quoted as saying, "I see a deeper beauty that isn't so readily available to others.... The color of the flower is red. Does the fact that the plant has color mean that it evolved to attract insects? This adds a further question. Can insects see color? Do they have an aesthetic sense? And so on. I don't see how studying a flower ever detracts from its beauty. It only adds." There is an obtuseness here, a determined missing of a crucial point; it is well captured by the great art critic John Ruskin, whom Dawkins cites with contempt: "We cannot fathom the mystery of a single flower, nor is it intended that we should; but that the pursuit of science should constantly be stayed by the love of beauty, and the accuracy of knowledge by tenderness of emotion."

"My title is from Keats, who believed that Newton had destroyed all the poetry of the rainbow by reducing it to the prismatic colors. Keats could hardly have been more wrong."

—Richard Dawkins

I have a painter friend who looks at a red flower and feels her eyes and mind fairly burst with the thrust of color. She shivers, thrills, becomes warm and at last enters an almost trancelike state in which she makes an inspired transformation of the flower, using her own very different kind of genius to apply pigments in colloidal suspension onto stretched white cloth. Then I or you come along, look at her painting and, if we are lucky, experience something like what she felt and thought before us, even though we ourselves may have completely missed the flower.

If it is possible to think clearly about the coevolution of flowers and insects (a fascinating subject I lecture on in my courses) and at the same time to have the experience the painter had, this must occur in a different sort of brain from mine. That is where Feynman's claim that science never detracts, only adds, is wrong. In the long run, it does add, in a myriad of ways. In the very long run, plate tectonics even makes hills skip, sort of, like rams. But in the moment, you cannot both think through Darwin's argument about why flowers are brightly colored and at the same time have your mind bursting or entranced with *red*.

Dawkins rambles amiably through some other topics of interest to him: forensic use of DNA, probabilistic explanations of coincidences that lead to superstition, and, of course, evolution. Along the way he properly strikes at and bags wizards, astrologers, conjurers and other banes of the gullible, as well as some larger quarry, like journalists, politicians and theologians. The link here seems to be that hoodwinkers feed on public credulity by using bad poetry. So the great but scientifically unsound poetry of Keats and Blake leads, through a kind of guilt by association, to the outright abuse of poetry by charlatans.

Poetry and Science

Dawkins reserves some serious animus for scientist-colleagues who also, according to his view, use poetry to mislead. James Lovelock's Gaia hypothesis, Pierre Teilhard de Chardin's evolutionary mysticism and Frans de Waal's "good natured" bonobos come in for valid criticism. But one target is favored: "My remaining examples of bad poetry in evolutionary science come largely from ... Stephen Jay Gould. I am anxious that such critical concentration upon one individual shall not be taken as personally rancorous." Ah, butter wouldn't melt in Dr. Dawkins's mouth. Forget that both of them have been writing contemptuously of each other's ideas for decades, giving off more heat than light.

Gould does need to be reminded: Darwinian ideas are still struggling gamely for their own survival. The world does not need protecting from them, or even from overstatements of them, so much as it needs their small piece of the truth. Don't use your great gifts to restrain honest inquiry in the service of a liberal philosophy that is really outside science. That vision of the world, which I happen to share, will—like any legitimate philosophy—be better served by the truth.

To Dawkins, one wants to say, Lighten up. People believed in God, ghosts, imps and fairy tales before you arrived and will do so after you're gone. Science is a still, small voice in the dark, as difficult to master as Schubert's lieder for the tenor. Cultivate your mastery, teach it to those few of the young who have inclination and aptitude, and be glad that it almost always leads to a more secure income than lieder do. As for people who believe things for which there is no evidence, they too adapt, survive and reproduce. If a spider's web is beautiful, why not a cathedral? If a butterfly's wing, why not faith?

I teach a freshman colloquium on human nature in which we read *The Selfish Gene*—and also Freud, Shakespeare, Toni Morrison, Antonio Damasio and other observers of the passing human scene. Neither Gould nor Dawkins would like the syllabus. Gould would fear that my students won't keep Darwin in his place but become Panglossian adaptationists and cryptoeugenicists. Dawkins would fear that my students won't realize how very, *very* important Darwin's theory is. I won't say, A plague on both their houses, since I admire both too much. But each could use a dollop of restraint, and as for humility, it ought to be poured over both of them like catsup.

Consider this instance of its absence: "I remember once trying gently to amuse a six-year-old child at Christmas time by reckoning up with her how long it would take Father Christmas to go down all the chimneys in the world.... The obvious possibility that her parents had been telling falsehoods never seemed to cross her mind." A grown man using statistics as a wedge between a six-year-old and Santa Claus is scarcely the right person to assuage people's fears of science. The book begins with the despair of a foreign publisher of *The Selfish Gene*, who spent three sleepless nights pondering "what he saw as its cold, bleak message." Dawkins, however, does little in this book to confront such despair. What is missing here is a tragic sense of life, with-

out which no one can transcend despair. We must work our way through it, but Dawkins only tries to brush it away.

"It is a central theme of this book," he writes, "that science, at its best, should leave room for poetry." But his science does not, because he does not seem to understand how poetry works or what it is for. A quarter-century after the fact, I can still hear the almost surreal beauty in the voice of a young Englishwoman, singing these lines of Blake's in her house in an African town where she and her husband were doing conservation work:

> And did the Countenance Divine
> Shine forth upon our clouded hills?
> And was Jerusalem builded here
> Among these dark Satanic mills?

Surely an offense against reason, the Second Coming of Jesus in early industrial England, and nothing I find remotely plausible. Yet I love the poem and I feel its greatness by suspending, for a few minutes, my scientific judgment. Dawkins makes little attempt to understand why Keats, Blake, Yeats and other poetic geniuses were afraid of science. At the end of a century in which science gave us mustard gas, Zyklon B, Hiroshima, germ warfare, cyberterrorism, a hole in the ozone layer and a rate of species extinction unprecedented since a stray chunk of cosmic rock went plop at the edge of the Yucatán, we could perhaps show a little more sympathy for people's fears. What Blake did not foresee was that science would also help clean up the soot shed by those same mills—in no small part, I would guess, because generations of English schoolchildren sang Blake's words set as an exquisite hymn. Still, it is not clear that we will continue to keep up with ourselves, and the next great blip in the history of life may yet be caused by human inventiveness.

There would no doubt be a certain aesthetic appeal in wiping the planet's slate clean and starting a new adaptive radiation. But despite the possible elegance of such an event, we want to avoid it. And if we do, it will be in part because of the reaction of poetry to science, with poets reminding scientists of their humanity, their spiritual responsibility and the risks associated with their enterprise. No attempt, however well meaning, to bring poetry under science's wing will ever affect its ultimate, essential independence. Let science tend its garden; poetry, as always the poor, neglected sibling, playing the mandolin and warbling softly but determinedly under a scraggly willow tree, will, I suspect, continue—however improbably—to take care of itself.

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THE EDITORS RECOMMEND

WHEN THINGS START TO THINK. Neil Gershenfeld. Henry Holt and Company, New York, 1999 ($25).

An Associated Press report from Issaquah, Wash., in 1997 told of a man who pulled a gun and shot his personal computer several times. The police took him off for mental evaluation. According to Gershenfeld, "they should have instead checked the computer for irrational and antisocial behavior." Which is to say that Gershenfeld, director of the physics and media group and co-director of the Things That Think (TTT) consortium at the Massachusetts Institute of Technology's Media Lab, is yet another computer wizard who thinks that computers and other high-technology devices are too hard to use. "There is a disconnect," he says, "between the breathless pronouncements of cybergurus and the experience of ordinary people left perpetually upgrading hardware to meet the demands of new software, or wondering where their files have gone, or trying to understand why they can't connect to the network. The [digital] revolution so far has been for the computers, not the people."

That said, Gershenfeld goes on to describe a number of ways in which devices might be designed to anticipate the user's needs and operate almost invisibly from the user's viewpoint. Taking health care as an example, he envisions what Things That Think might do. "In a TTT world, the medicine cabinet could monitor the medicine consumption, the toilet could perform routine chemical analyses, both could be connected to the doctor to report aberrations, and to the pharmacy to order refills, delivered by FedEx (along with the milk ordered by the refrigerator and the washing machine's request for more soap)."

NIGHT COMES TO THE CRETACEOUS: DINOSAUR EXTINCTION AND THE TRANSFORMATION OF MODERN GEOLOGY. James Lawrence Powell. W. H. Freeman and Company, New York, 1998 ($22.95).

In 1964 Glenn Jepsen, a paleontologist at Princeton University, published an article listing 31 causes, ranging from plausible to implausible, that had been proposed for the extinction of the dinosaurs. Among them, fairly well down on the list, was "meteorites." Since then, the case for meteorites—specifically an asteroid impact on the earth 65 million years ago—has largely won the day. Powell, a geologist who directs the Los Angeles County Museum of Natural History, traces the impact of the impact theory from its introduction in 1980 by physicist Luis Alvarez and his son, Walter, a geologist. Powell lays out persuasively the evidence that has accumulated to give force to the Alvarez theory. He also maintains that the impact theory has transformed geology. Uniformitarianism—the doctrine that all past geologic changes can be understood by studying only processes that can be seen going on today—must now confront, he says, the "strong evidence that major events in earth history are controlled by forces from outside the earth."

THE SEARCH FOR THE GIANT SQUID. Richard Ellis. Lyons Press, New York, 1998 ($35).

"A single 60-foot-long giant squid represents the stuff of nightmares, with its writhing arms and saucer-sized eyes," Ellis writes. *Architeuthis* also represents the stuff of mystery. Virtually all that is known about it rests on dead or dying specimens that have washed ashore or been hauled in at sea—places remote from the creature's deep-ocean habitat. Ellis's table of authenticated sightings and strandings has 166 entries, beginning in 1545 and extending to 1996. His bibliography indicates the scope of the search he had to make to assemble material about his mysterious subject; it

GLEN LOATES