Fear: The world we have inherited is in many ways the safest—least risky to the individual and the species—that has ever existed.

So why, he asks, are we afraid of so many things? Why do homicides, abductions, and other statistically unlikely threats (Gardner includes terrorism among these) occupy an inordinate amount of our attention and consume resources that could be spent protecting us from statistically far more significant threats, such as preventable illnesses? Gardner's answer is that evolution has equipped us with a brain superbly suited to tell us what to do when we spot a large brown thing in the long grass: recognize it for a lion, get scared, and run like hell; once safe, tell everybody about what happened to the slowest one. But our brains are ill equipped to process—at that same speed, and based on the same need-to-know premise—the more subtle dangers coming our way.

The brain Homo sapiens possessed as early as 200,000 years ago has remained unchanged in the blink of an eye that constitutes the span of modern history. This brain consists of subconscious and conscious, or what Gardner calls "Gut" and "Head." Once, Gut (feeling) kept people alive by rapidly, intuitively differentiating between safe and dangerous, and by prompting life-saving actions based on its split-second verdict. Head (reason)—the ability to use logic, analyze, do the math—was not useful, given the conditions.

Gut brought the species far, by instinctively following a set of rules. Gardner, a Canadian journalist, draws on a wealth of academic research to catalog these rules and show how necessary they were for making the world intelligible and survivable for prehistoric humankind. And he convincingly argues that they can thoroughly mislead *us*—and are used by manipulators of all stripes to do so. (What better way to sell us software X or burglar alarm Y than by frightening us with inflated numbers of Internet predators or crimes we're unlikely to become victims of?)

Take, for instance, "the Example Rule": Gut tells us that the more easily we recall an event, the more likely it is to happen again. In an environment where information is local, the example of one member of the tribe being eaten by a lion plants in the other members a vivid—hence, easy to recall—memory of the very real danger of lions and places frequented by lions. In an environment where information propagates rapidly, and a hundred million of us find out, through the media, about one gruesome homicide, the example, processed by Gut in the same way, does little or nothing to make us safer. But it does raise the national anxiety level and make us more easily persuaded to allocate funds for more prisons or to support the death penalty.

Gardner puts into context half a dozen other such rules. All of them share their immense usefulness for the survival of hunters and gatherers. And all of them share the unfortunate potential to make us bark up the wrong light pole in environments where light poles outnumber trees.

His analysis suggests that for the sake of *our* survival, one fear ought to become stronger: that of being afraid of the wrong things. He may not succeed in shutting up Gut when it says "Lock the doors or risk being murdered," but he presents compelling evidence that unfounded fears pose real dangers. Only by recognizing these dangers will we be ready to give Head a chance and to fight wasteful and foolish measures proposed to keep us safe from what we needn't fear.

Evelin Sullivan, a lecturer at Stanford University, is the author of *The Concise Book of Lying* (2001) and four novels. She is at work on a book about the natural history of fear.

Einstein, Relatively Speaking

Reviewed by David Lindley

EINSTEIN'S MISTAKES: The Human Failings of Genius.
By Hans C. Ohanian. Norton. 394 pp. $24.95

Physicists sometimes indulge in an entertaining but largely pointless debate about which of their two preeminent geniuses, Isaac Newton or Albert Einstein, deserves the all-time number one ranking. Hans

Ohanian has no doubts on the matter. Newton is worth several Einsteins, he tells us, although it would have been more in keeping with the frequently pedantic spirit of his book if he had let us know exactly how many Einsteins—three? four and a quarter?—stack up to one Newton. At one point, Ohanian even suggests that Einstein wasn't quite up to the level of Max Planck, the founder of quantum theory, but by the end of *Einstein's Mistakes* he has restored Einstein to the number two position. Putting Einstein in his place seems, at any rate, to be Ohanian's main purpose.

Though recent biographies have largely dispelled the cherished myth that Einstein was a dunce at school, it is true that the great physicist was not a natural mathematician. After making the enormous conceptual leap that connected the phenomenon of gravitation to the fact that space-time is curved, it took Einstein many excruciating years to find the appropriate mathematical expression for this idea and thereby create the theory of general relativity. Einstein's earlier attempts, some published, some abandoned, contained deep flaws. In his other revolutionary achievements too, Einstein's first pronouncements were rarely the last word. Over the years, those original insights were painstakingly polished to become the scientific theories we know today, and often it was other physicists—more rigorous than Einstein, if less imaginative—who filled in the gaps and supplied the finishing touches.

This, by and large, is nothing more than how science ordinarily progresses, but Ohanian, a former editor at the *American Journal of Physics* and author of several textbooks, seems intent on finding in the missteps and fudges of Einstein's papers a new and shocking portrait of the man. Einstein's pre-1905 efforts "have faded into the obscurity they richly deserve." He made blunders in his great works of 1905 because he "was not thinking like a physicist, but like a patent clerk." A mistake in the first attempt to prove that $E = mc^2$ "is the sort of thing every amateur mathematician knows to watch out for." And so on.

There is, to be sure, the germ of an interesting story here. Einstein's arguments were often makeshift and occasionally shoddy, but most of the time he knew where he wanted to go and found a way to get there. That, as Ohanian admits, is one definition of genius, but he shows little interest in pursuing the thought. Instead, facing up to the evident truth that Einstein repeatedly hit on answers to difficult puzzles before he could figure out a convincing justification for them, Ohanian can only throw up his hands and declare that Einstein was "a mystic in the throes of a revelation." In his minute analysis of Einstein's works, Ohanian reveals himself to be the kind of strictly logical, step-by-step physicist that Einstein plainly was not, and Ohanian's inability to cope with that difference almost seems to have turned into a personal animosity.

This is a scientific rather than a personal study, but still, Ohanian finds time to mention the less attractive aspects of Einstein's character: his shabby treatment of his first wife, his neglect of his children, his tendency to slight his colleagues' scientific contributions, his dreadful sartorial sense, his love of certain disgustingly heavy German foods. Only in the later chapters, when the aging Einstein has come to America to spend his final years working fruitlessly on a "theory of everything," does the tone soften. An eccentric, rather lonely figure, Einstein turns at last into a dotty old uncle whom Ohanian can regard with pity instead of scorn.

David Lindley is the author, most recently, of *Uncertainty: Einstein, Heisenberg, Bohr, and the Struggle for the Soul of Science* (2007).

Fuller's Earth

Reviewed by Edward Tenner

BUCKMINSTER FULLER: Starting With the Universe.

Edited by K. Michael Hays and Dana Miller. Yale Univ. Press. 258 pp. $50

When he died in 1983, Buckminster Fuller was the world's most beloved designer, a pioneer of bold new geometric concepts in transportation (the streamlined Dymaxion Car), housing (the geodesic dome, a lightweight