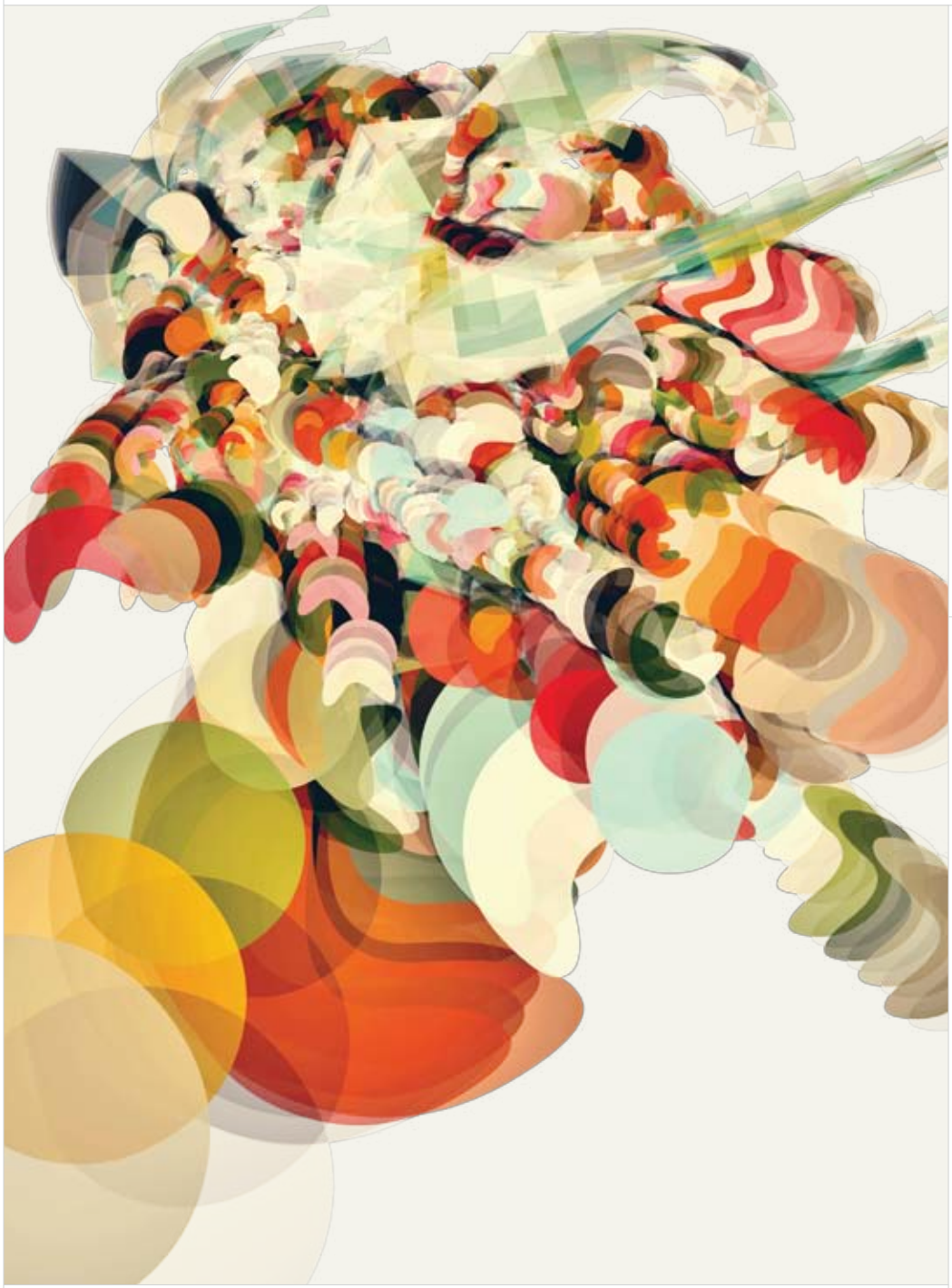
LEAD REVIEW

Model of Imperfection

The clunky wiring of our brain may reveal just as much about our humanity as it does about the evolutionary process. By PZ Myers



Kluge: The Haphazard Construction of the Human Mind
By Gary Marcus
(Houghton Mifflin)

THERE ARE WORDS THAT ARE euphonious and indispensable to one's vocabulary; one of my favorites is "bricolage," a word used to describe both a kind of simple art and the way evolution builds new forms by tinkering and randomly patching together subunits of functionality. Not only is it extremely useful, it has the satisfying, onomatopoetic quality of assembling itself into three neatly stacked syllables. Other useful words may not ring so harmoniously to the ear. An evocative example is "kluge," a "clumsy or inelegant solution to a problem." If you've ever tried to fix a wobbly table by browsing your library to find a book of exactly the right thickness to put under the short leg, you are already familiar with the concept. Kluges work, and they tend to be fast and easy, but they're hardly a demonstration of meticulous artisanship and are often just plain ugly.

The word, perhaps not surprisingly, originated in the halls of computer science. Biologists are quite familiar with the idea, too, as we examine the products of evolution and find a patchwork of shims and Rube-Goldbergian contraptions that

ILLUSTRATION BY ERIK NATZKE

work wondrously well, but are clearly jury-rigged products of unplanned forces that don't include aesthetics as a criterion.

Gary Marcus, a professor of psychology at NYU, devotes an entire book, *Kluge: the Haphazard Construction of the Human Mind*, to the colossal kluge that is our brain. His emphasis on the peculiar quirks of our minds—our odd decisions and weird interpretations—makes for a fascinating, self-referential read. By dissecting our motives, beliefs, and mental constructs—including the very skills we use to read the book—Marcus reveals how each are often flawed, and how we compensate for the errors.

Marcus begins with an excellent overview of memory, the quintessential kluge. Our memories, as many of us might suspect, are unreliable, and access to them is not at all direct—they're associational, requiring us to pin concepts to odd secondary referents in order to recollect them. For instance, when asking my students to memorize the geological periods of the Paleozoic and Mezozoic eras, I teach them the mnemonic "CAMels Often Sit Down CARefully, PERhaps Their Joints CREak" to help them remember Cambrian, Ordovician, Silurian, Devonian, Carboniferous, Permian, Triassic, Jurassic, and Cretaceous. Such tricks work, but why do we need them? Why can't we simply file away names and dates in some directly accessible manner?

A mnemonic is a kluge, an elaborate trick we use to get the patchwork assembly of our memory to work in new and useful ways. Marcus describes a few other methods that experts use to perform feats of memory, but, as he points out, they're all elaborate schemes to tie the objects we want to memorize to more memorable contexts. And none of them are as simple and as reliable as the memory-addressing methods we implement in even our simplest computers. There are better ways that the mind could work, but accidents of evolution mean we have inherited mechanisms that, though far from ideal, are good enough.

In other chapters, Marcus deals with the difficult abstractions of belief and choice. Our minds often display peculiar inclinations that can be incomprehensible to those who don't share them—the author admits to liking 1970s-era disco, for instance—and we also make choices that can conflict with our own self-interest. Why do we eat fatty or sugary foods when we are consciously aware that in excess they are bad for us? Marcus's explanation is that our minds are a layered hodgepodge: We have a conscious, deliberative layer that weighs alternatives and plans ahead, and a deeper, more primitive layer that simply reacts and seizes opportunities as they arise. And, unfortunately for us, that reactive layer is faster and tends to win out, to the disadvantage of our waistlines or, in Marcus's case, his musical tastes.

Marcus delves into language, of course: It's rich and powerful, but it's also prone to ambiguities, confusion, clumsy complexities, and bewildering structural agglomerations that are a consequence of a history of accidents and borrowings. He also discusses the more egregious errors of the mind. Not just the gross pathologies of diseases like schizophrenia, but the nagging stresses of anxiety or depression or fear of social stigma. These aren't just failures—he argues that these are revealing fractures that expose the seams of the evolutionary patchwork.

There is no denying that our minds are the product of our biology and our history. And the evolution of the mind has been a popular topic lately, driven by interest in the relatively new field of evolutionary psychology. But Marcus is providing an important twist on the subject. Most evolutionary psychology focuses on the adaptations of the brain; it's more of a selectionist psychology, where almost all the interest is in the features that have been functionally optimized. Marcus turns that around and looks at the suboptimal and inelegant features that have arisen by accident, as optimizations in organisms that don't put a high value on deliberative thought. This is a valuable perspective. One criticism of evolutionary psychology is that it has a tendency to shoehorn *everything* into an adaptive framework, when we know that kluges abound; this book complements the evo-psych view by emphasizing the variety of less-than-optimal solutions that have evolved, and that demand compensatory adaptations.

The twisty, baroque elaborations of our mind move us beyond the simple, elegant efficiency of an insect.

Nevertheless, our minds are the essence of who we are. We identify with the operation of our minds, having an illusion that our brains are well-oiled engines of thought, and that our occasional mistakes are because of bad or incomplete input, not because the mind has fundamental shortcomings. Marcus' collection of exposés is tailored to show us how our priorities, our beliefs, our language, the basic mechanisms of our minds, are all products of short-sighted expediency and accidental quirks of history. Once again, science disenthrones humankind from the perception of an exalted position. We no longer live on a planet that is the center of the universe, our ancestors were all apes and tree-dwelling mammals and fish and bacteria, and now we have to face the fact that our one unique adaptation, our expanded cortex, is a flawed organ. There is solace in this view of life, however. We are not machines honed to ruthless efficiency; it is our idiosyncrasies and fortunate quirks that instigate art, music, poetry, and an appreciation of beauty and the unusual. It is the twisty, baroque elaborations of our mind that move us beyond the simple, elegant efficiency of an insect into the celebration of behaviors beyond reproduction and food-gathering that makes us human.

Marcus closes the book with some commonsense advice on how to cope with the shortcomings of our minds. Our minds do work quite well, and if you're aware of some of the evolutionary mechanisms that cause it to veer in less than desirable directions, he says, you might well be able to effectively compensate. "Knowing about knowing" can help us overcome the pitfalls into which blithe confidence in a glitchy algorithm might lead us.

Now about that title, though: "Kluge." Surely there must be some other lovely, poetic phrase—a borrowing from French or Italian, perhaps—that would be a little prettier, and resemble less the mating call of a moose. But maybe that's the point. The word itself is a kluge, an unlovely choice with an accidental heritage, but it does get the job done. And Gary Marcus's book makes it an indispensable term for explaining the human mind. ∞

15.2 SQUIRREL CAMOUFLAGE

According to a recent study, certain squirrels camouflage their scent by chewing rattlesnake skin and spreading it over their bodies. Scientists observed California ground squirrels and rock squirrels as they chewed the shed skins of their primary predators and licked their fur, noting that juveniles and females—the most vulnerable squirrels and their protectors—spent a longer time smearing themselves with the scent than did adult males. The researchers say this indicates that the behavior is primarily a defense against predators, not against parasites or other squirrels.

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