the tables and graphs they produced were equally effective at communicat-
ing, and memorializing, the awful his-
tory. Rather, this is a story about the
interplay between fact and emotion,
about the human need to create a fac-
tual record even in the direst of circum-
stances, when the creators of the record
knew full well that they were about to
become statistics themselves. Emotions
do not necessarily scale with objective
measures of the magnitude of an event;
the memorial to the 168 victims of the
Oklahoma City bombing of 1995 may
be every bit as moving as the Vietnam
memorial with its 58,261 names. As
Wainer writes,

Worthy memorials draw on both
fact and emotion. We should not
underestimate the power of even
simple numerical displays to help
bridge the gap between a statistic
and a tragedy.

In the final analysis, then, this book
is not so much about uncertainty or
graphical display as about the com-
munication of facts, and the interplay
of that information with interpretation,
emotion and the many other subjec-
tive dimensions of the human experi-
ence. *Picturing the Uncertain World* will
appeal to a wide audience, because its
arguments are accessible and intuitive,
and the occasional references to statis-
tical theory are handled very gently.
Like two of Wainer’s earlier books—
*Visual Revelations: Graphical Tales of Fate*
and *Deception from Napoleon Bonaparte to Ross Perot* (1997) and *Graphic Dis-
covery: A Trout in the Milk and Other Visual Adventures* (2005)—this one makes for
very fine reading and would be an
excellent text for a general-education
seminar.

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**NEUROSCIENCE**

**Unique. Sort of.**

Melvin Konner

**HUMAN: The Science Behind What Makes Us Unique.** Michael S. Gazzaniga. xiv + 447
pp., HarperCollins/Ecco, 2008. $27.50.

The fine intellectual adventure
that is Michael Gazzaniga’s
latest book, *HUMAN: The Science
Behind What Makes Us Unique*, opens
with these sentences:

> The great psychologist David
>Premack once lamented, “Why is
> it that the [equally great] biologist
>E. O. Wilson can spot the difference
>between two different kinds of ants
>at a hundred yards, but can’t
>see the difference between an ant
>and a human?” The quip under-
>lines strong differences of opinion
>on the issue of human uniqueness.

The fact that Gazzaniga added the
phrase in brackets suggests less than
complete concurrence with Premack.
But since this “quip” is meant to frame
the book, it’s interesting to recall that Wil-
son wrote in his most famous work, *So-
ciobiology* (1975), that “the development
of human speech represents a quantum
leap in evolution comparable to the as-
sembly of the eukaryotic cell,” which is
tantamount to calling it one of the most
important events in the history of life.
Ironically, Premack is best known for his
elegant work teaching a keyboard-based
symbolic language to chimpanzees. In
reality, though, neither Premack nor Wil-
son—nor, certainly, Gazzaniga—doubts
for a moment that humans are unique,
and in more than just the sense in which
any species is. Gazzaniga’s goal in *Hu-
man* is to find out what makes us so.

It’s a tall order, but a much more
tractable one than the effort to explain,
say, consciousness or free will. “What
is the deal with humans?” (as Gazzan-
iga engagingly puts it) is an empirical
question, and he is past master of the
empirical materials, bringing to the task
a 45-year career as a neuroscientist. A
pioneer in the split-brain research that
helped lay the foundations of our un-
derstanding of lateralization of function,
Gazzaniga went on to make many dis-
coveries on the frontier of brain imag-
ing. He is editor of the comprehensive
reference work *Cognitive Neurosciences*,
now in its third edition, and is author of
*The Ethical Brain* and many other books.

Here he is a helpful, amusing and
modest guide. In the acknowledgments
to *Human* he remembers his house-
mates in graduate school at Caltech,
most of them physicists, as having been
“all much smarter and wiser than I . . .
They thought hard about hard prob-
lems and they cracked many of them.”

Smarter, perhaps, in some ways; wiser,
I doubt very much. Gazzaniga is about as
wise as humans get, and wisdom is not
about cracking hard problems. It’s about
judgment in the face of immense com-
plexity. However hard a puzzle in phys-
ics may be, the solution is in retrospect
elegant and clear. Human uniqueness is
not a puzzle in that sense; rather, it is a
domain of understanding, and however
much understanding we gain, a great
deal will remain messy and unclear—
which is where wisdom comes in.

I can only give a sketch here of the
compendium of unique human traits
considered in this rich and rewarding
book. The human brain has tripled in
size over the 6 or 7 million years that
have passed since humans diverged
from chimpanzees. A certain amount of
reorganizing went along with that
increase in size, increased lateralization
being a prime example. Many genes
and noncoding RNAs are expressed
only in human brains, and many of
 those have to do with wiring up the
brain during development. Bipedal
walking freed our hands and allowed
us to develop our unusually opposable
thumbs for making tools. Our brains
uniquely evolved for language and for
an exceptional ability to think about the
mental states of others.

We are the only species that can gos-
sip, an important means of social con-
trary, and only a human will expend
ergy punishing a cheater who has
cheated someone else. We are the only
creatures that show disgust (hence our
peculiar concern with purity), blush in
embarrassment or shed tears of emo-
tion. We display levels of empathy at-
tained by no other species. We mentally
imagine and simulate the actions and
experiences (pain, shame) of others to a
remarkable extent. Our lives are pervad-
ed by aesthetic choices and preferences
unknown to other species. We create art,
religion and narrative, and we are self-
aware to the nth degree. Only we can
autocue, deliberately remembering and reminding ourselves of things.

These are just a few of the interesting points made, whose effect is to make you feel superior to all other species. You are, and you can enjoy sifting through the experimental evidence for that claim. Increasingly, these unique behavioral and psychological features are being tied to brain structure and function. Quite properly, Gazzaniga believes that these findings will lead in time to a coherent psychobiological theory, although his emphasis on modularity in the brain makes it possible to imagine a persistent lack of coherence.

One might have wished for more attention to animal field studies and cross-cultural comparisons, but even those are here to some degree. As most ordinary people throughout the world have long believed, humans are quite different from other animals. And Gazzaniga has not neglected the views of nonscientists. He asked a lot of acquaintances what they thought was unique about humans, and two of the responses he got are especially instructive.

A five-year-old said, “Animals don’t have birthday parties for themselves, you have to give them one.” And someone in an obstetrics clinic said, “I think at the core humans are no different from animals. We all have the bestial urges of expanding our hunting range, controlling resources, and spreading our DNA.” The five-year-old offers one of an infinite number of things that only humans do, something that is particularly salient for him. You might say that many of the things discussed in this book are like that birthday party—unique, but too particular to make much sense of—although many are more interesting and may in time figure in a theory of how we are fundamentally different.

The dour observer at the obstetrics clinic offers a small number of characteristics that we share with other animals. The difficulty is that these may be more important than the infinite number of characteristics that we don’t share. The question is not how we are fundamentally different, but how fundamental the differences are. That is what motivates many of us to consider what people have in common with chimpanzees, peacocks or, for that matter, ants. Countless unique human qualities were used by cultured Germans to murder millions. And only human qualities were used by cultured or, for that matter, ants. Countless unique in common with chimpanzees, peacocks although many are more interesting and may in time figure in a theory of how we are fundamentally different.

The book makes these points through a series of connected vignettes. Thus ecosystems without predators are decidedly abnormal. Such insights were influential, but it took biologists some time to realize that ecosystems deprived of predators are decidedly abnormal.

Back to Paine: In the late 1960s, he and one of his students performed an experiment in which they removed sea urchins from tide pools and found that in their absence kelp quickly established itself. In 1971 Paine passed this information along to James A. Estes, a graduate student in ecology at the University of Connecticut.

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ECOLOGY

Missing, and Sorely Missed

Peter A. Bednekoff


We are enthralled by large predators, yet we have exterminated them throughout most of their historic ranges. We use them symbolically as mascots and them totems that are only minimally salient for them. You might say that many of the things discussed in this book are like that birthday party—unique, but too particular to make much sense of—although many are more interesting and may in time figure in a theory of how we are fundamentally different.

The dour observer at the obstetrics clinic offers a small number of characteristics that we share with other animals. The difficulty is that these may be more important than the infinite number of characteristics that we don’t share. The question is not how we are fundamentally different, but how fundamental the differences are. That is what motivates many of us to consider what people have in common with chimpanzees, peacocks or, for that matter, ants. Countless unique human qualities were used by cultured Germans to murder millions. And only a human would advertise on the Internet to try to make a profit by bringing men seeking sex to an entrapped 13-year-old girl. In the core of our uniquely human brain is a set of structures brought down from our evolutionary past, and it is far from clear that they are really controlled by the newer structures. Too often, our unique human qualities seem to end up in the service of baser motives that we share with many other species.

But enough of the dark side. One of the special human qualities is taking pleasure in contemplating big scientific and philosophical questions. If you want to find out what we know today about how human brains and minds transcend those of other species, and particularly if you take pleasure in contemplating our superiority, you can’t do better than Michael Gazzaniga’s Human. And although I myself may spend more time contemplating the dark side, I completely agree with Gazzaniga when he says, No other species aspires to be more than it is. Perhaps we can be. Sure, we may be only slightly different, but then, some ice is only one degree colder than liquid water.

If we are to turn our unique features into such a phase shift, surely we must thoroughly understand them, and this book is an excellent place to start.


