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THE CHRONICLE REVIEW

The Mysteries of Becoming Human



By David P. Barash | JUNE 18, 2012

"Mystics exult in mystery and want it to stay mysterious," writes Richard Dawkins.

"Scientists exult in mystery for a different reason: It gives them something to do." That, in a nutshell, is my text for today.

We are surrounded by mysteries. There are more things in human biology than are dreamed of in our philosophy, or—more to the point—known by our science. But don't get the wrong idea: Mystery is not the same as mysticism. Just as a "weed" is a plant that hasn't yet been assigned a value, the mysteries that still characterize *Homo sapiens* are scientific questions waiting for answers.

There is no doubt that our collective store of knowledge has been increasing strikingly, and that science is largely responsible. At the same time, there is also no doubt that plenty remains to be learned. Although some people gesture toward what has been called "the end of science"—the notion that all the Big Questions have been answered, leaving us with mere mopping-up operations—the reality is that we still do not know an awful lot.

"Know thyself"? Easier said than done. Most articles and books about science are just that: Accounts of what has already been learned. What of the mysteries? What we *don't* know. Yet.

The *Collins English Dictionary* (2003) defines mystery as "an unexplained or inexplicable event, phenomenon, etc.," which seems reasonable enough ... until you think about it. For an event or phenomenon to be unexplained is one thing, but to be inexplicable is quite another. If something is truly inexplicable, it is beyond the reach of human understanding. At issue, therefore, is not the inexplicable, but rather the *unexplained* things about human beings, that which is currently unknown but nonetheless falls within the potential reach of science. After all, the real world poses genuine mysteries aplenty, that is, puzzles that are not yet comprehensible, but which we can be confident will be brought to heel, sometime in the future.

Science is in the business of doing just that, answering questions about the natural world, *Homo sapiens* included. And since nature does not disclose her secrets readily, we scientists are understandably proud whenever we solve any of her numerous puzzles. As a result, we teach courses, give lectures, and occasionally write books whose goal is to share our triumphs. They are hard won and often immensely useful. No one, therefore, should begrudge our taking a victory lap now and then.

But just as the race is not always to the swift, nor the battle to the strong (Ecclesiastes 9:11), the cheers of the crowd do not always bespeak that the race is over, nor the battle won.

I have been teaching science courses at the college level for 40 years, during which I have been no less guilty than my colleagues of providing what may well be a misleading perspective on science. Like everyone else, I teach what is known, often at the risk of misrepresenting to students that today's science is a catalog of established and comprehended facts: This is how cells metabolize carbohydrates, this is how natural selection works, this is how the information encoded in DNA is translated into proteins. The reality, of course, is that we know quite a bit about how cells metabolize carbohydrates, how natural selection works, and so forth. But another, parallel reality is that there is much more that we do not know ... and very few courses talk about that. (One of these days, I will design a course titled something like "What We Don't Know About Biology," hoping that my colleagues in chemistry, physics, geology, mathematics, psychology, and the like will join the fun.)

But until then, we must make do. The famous *Encyclopédie*, first published in France between 1751 and 1765, endeavored to summarize all human knowledge in 17 volumes of text. Its primary editor, Denis Diderot, was one of the heroes of the Enlightenment, and indeed, the *Encyclopédie* represents a culmination of Enlightenment thought, which valued reason, science, and progress—what we know—above all else. The *Encyclopédie*'s frontispiece depicts Truth (surrounded by a bright light, traditional symbol of the Enlightenment itself) as an attractive young woman being disrobed by Reason and Natural Philosophy (i.e., Science). The illustration is more than a bit erotic, as Truth is revealed to be both alluring and accessible, albeit demurely shy.

I propose that we continue the tradition of the *Encyclopédie*'s frontispiece, attempting to get a closer look at Truth, but instead of undressing her, to proceed non-voyeuristically, pointing out where, despite the best efforts of Reason and Science, she continues to be clothed.

Unlike the *Encyclopédie*, which took all knowledge as its subject, we shall have our hands full limiting ourselves to human beings, and not only that, to certain characteristics of *Homo sapiens* as seen through the lens of my own field, evolutionary biology.

The traits in question are fundamental to being human, stubborn stigmata of our species' unique evolutionary heritage, yet their basis is neither understood by scientists nor even, for the most part, acknowledged by the public as the puzzles that they are. Thus, most people are unaware that the female orgasm, for example, or religious belief, are biological mysteries, simply because nearly everyone takes the most intimate aspects of his or her life for granted.

As members of *Homo sapiens*, we are almost literally immersed in mystery; the evolutionary enigmas of humankind are the seas in which we swim. It is time to explore (even to exult in) this ocean of unknowns.

At the risk of channeling former Secretary of Defense Donald Rumsfeld, there are "unknown unknowns," things that we don't understand and that we don't even know that we don't know. Since we can't identify them, "unknown unknowns" are difficult—perhaps impossible—to write about. But there are also "known unknowns," things that we don't yet understand but that we at least have the wisdom to acknowledge as such. Before Albert Einstein, Niels Bohr, Enrico Fermi, and others, nuclear energy was a known unknown, just as evolution was before Darwin.

My personal preference is to be less concerned with *how* these human mysteries came about than with *why*, not why in the metaphysical sense, but in that of evolutionary biologists. Were we to ask how people became bipedal, the answer would involve changes in muscle attachments, bone structure, and nerve growth; instead, to be concerned with the evolutionary *why* is to ask about the likely adaptive pressures that must have conveyed a reproductive advantage to those of our ancestors who walked on two legs, regardless of exactly how that posture was achieved.

Thus I'm less concerned with *how* religious belief, say, or homosexuality comes about—the nerves, muscles, brain regions, hormones, or specific genes responsible—than with *why* those behaviors, regardless of their underlying mechanisms, appeared and have persisted, despite their seeming evolutionary disadvantages.

The underlying conceptual theme is therefore: "In what way has _____ contributed to the ultimate reproductive success of human beings?" One way of conceptualizing this process is to think about what is sometimes called "reverse engineering." In normal engineering, a problem is identified, after which a device or structure is engineered as a solution. Reverse engineering operates, not surprisingly, in reverse: A device or structure (or, in our case, a behavior and its associated hardware) is identified, after which the evolutionary biologist tries to figure out how this particular phenomenon came to be "engineered"—which is to say, why it evolved.

In many cases, the process is straightforward and obvious. Why do we love our children? Almost certainly, potential ancestors who lacked parental love didn't do a very good job of caring for their offspring and therefore didn't become actual ancestors. In that sense, love may actually be less mysterious than is generally thought.

There are other human characteristics, however, far more mysterious than love; once we identify them, we face the question of "reverse engineering" them.

Here is my own list of some of those questions that a full evolutionary understanding of *Homo mysterious* ought to answer, and—I am confident—someday will:

Why does homosexuality persist? Given that, on balance, gay people of either sex produce fewer children than straight people do, this is a first-class evolutionary mystery.

Why do women menstruate? Some female mammals bleed a little bit in midcycle, but not as conspicuously as *Homo sapiens*.

Why do women have prominent nonlactating breasts? We are the only species of mammals thus endowed.

Why do women experience orgasm? Nonorgasmic women are no less successful than their orgasmic counterparts in reproducing, so what is the evolutionary payoff?

Why do men consistently live shorter lives than women?

Why are they more hairy on most of their body, yet less so on the top of their heads?

Why is it close to a "cross-cultural universal" for women to adorn their bodies more than men do? Among most animals, it's the reverse.

Why do women undergo menopause? It is exceedingly rare in other animals for females to stop ovulating when they still have much of their lives ahead of them.

Why is religion found in all human societies?

Why do people make art?

Why are human beings conscious? After all, it is possible to imagine a world of intelligent robots or zombies, going about their fitness-enhancing business without the slightest self-awareness.

Why did we evolve such big brains? Was it in the service of communication, tool use, social competition, warlike competition, sexual attraction?

Why do we laugh, cry, blush, dream?

What are the biological sources—if any—of human ethical judgments and rules?

That is just a starter list. The greatest evolutionary mysteries, I suspect, are those that we aren't currently able to enumerate, although there is, of course, a more cynical perspective. Put forth by the Polish philosopher Leszek Kolakowski, it has been called the "Law of the Infinite Cornucopia": For any belief, it is always possible to come up with a seemingly unlimited amount of supporting evidence. Perhaps it will also always be possible to come up with plausible but ultimately unsatisfying explanations for human evolutionary mysteries.

"Just as people find water wherever they dig, they everywhere find the incomprehensible, sooner or later." So wrote Georg Christoph Lichtenberg, 18th-century physicist and satirist. More than two centuries later, it isn't at all clear that people will find water wherever they dig. Nor is it certain that wherever we dig in the realm of life, we shall find the incomprehensible. My point, in fact, has been just the opposite: that we ourselves are comprehensible, even though we aren't at present altogether comprehended.

Unlike Sisyphus, moreover, who was condemned to spend eternity pushing a huge rock up a steep hill only to have it roll back down again, the scientific push for greater knowledge doesn't slip backward (at least, not for long). It may never reach a safe, secure, satisfactory (and tedious) stopping point. There will always more hills to climb. Or to concur with some wisdom from the poet-songwriter Leonard Cohen: "There is a crack in everything. That's

how the light gets in." Just one modification: There are many cracks. When it comes to some of the most interesting mysteries of human evolution, we would be well advised to refrain from seeking the explanation, simply because at this point, final answers just aren't yet available.

Hence the mystery ... and the fun.

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