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# The Holes in Gould's Semipermeable Membrane Between Science and Religion

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# Scientists' Bookshelf

## The Holes in Gould's Semipermeable Membrane Between Science and Religion

Ursula Goodenough

**Science  
Under Siege • 268**

**Lessons from  
Monkeys & Bees • 270**

**Dinos Down Under • 274**

**Other Worldly • 280**

**American  
Psychotherapy • 282**

**Maxwell Made  
Whole • 284**

**Rocks of Ages: Science and Religion in the Fullness of Life.** Stephen Jay Gould. 241 pp. Ballantine Publishing Group, 1999. \$18.95.

Like long Stephen Jay Gould readers will find in *Rocks of Ages* much that is delightfully familiar: graceful language flecked with occasional irreverence, wonderful anecdotes about Darwin and his friends and their times, and the side trips—to the Scopes trial, to the Vatican, to the flat-earth controversy—that slowly circle back to the main thread as engaging commentaries are proffered on the passing scenery. As always, Gould shoots some wonderful baskets, often from way outside the circle.

But it is the main thread that must be considered here, for Gould has most emphatically written a book that has a point and one point alone. That point is given the acronym NOMA, which stands for *non-overlapping magisteria*, where a magisterium is “a domain where one form of teaching holds the appropriate tools for meaningful discourse and resolution.” The two magisteria that fail to overlap are science and religion, and Gould declares the NOMA thesis to be “intellectually sound,” “eminently practical” and “laudable.”

NOMA is a simple, humane, rational, and altogether conventional ar-

gument for mutual respect, based on non-overlapping subject matter, between two components of wisdom in a full human life: our drive to understand the factual character of nature (the magisterium of science) and our need to define meaning in our lives and a moral basis for our actions (the magisterium of religion).

Moreover, he claims that “most religious and scientific leaders actually do advocate the precepts of NOMA,” the exceptions including creationists and militant atheists with a “blinkerred concept of religion.”

Such a gauntlet obviously invites response.

The first difficulty arises in considering Gould's definition of a magisterium, in which “each domain of inquiry frames its own rules and admissible questions, and sets its own criteria for judgment and resolution.” He has no difficulty describing the tools that govern the magisterium of science—they encompass, of course, the scientific method, wherein “conclusions must remain open to empirical test and potential rejection.” Indeed, of Thomas the Apostle, Gould writes:

Poor doubting Thomas. At his crucial and eponymous moment, he acted in the most admirable way for one style of inquiry—but in the wrong magisterium. He espoused the key principle of science while operating within the different magisterium of faith.

In contrast, Gould fails to describe the appropriate tools for meaningful discourse and resolution in the magis-

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## Deer Diary



Not only in elk, but in large mammals as a whole, ornate head gear is balanced by an ornate rump. That is, as antlers evolve, rump patches and tails coevolve. The elk is the most highly evolved of red deer because it carries the most ornate head and rear poles.

*Deer of the World: Their Evolution, Behavior, and Ecology*  
Valerius Geist  
Stackpole Books, \$60



terium of religion. We learn that the *outcome* of religious inquiry is meaning and morals, but it is not at all clear how these are to be discerned, discussed or resolved except that we are assured that the process is “logically distinct” and “fully separate in styles of inquiry” from science. Gould’s conclusion that the tools employed by doubting Thomases are out of line in the magisterium of religion is in fact likely to irritate, possibly outrage, some contemporary theologians. Moreover, since he tells us that “dogmatic theology” is “contrary to most people’s concept of religion” (news to me) and because “the validity of (ethical) principles can never be inferred from the factual discoveries of science,” we emerge with several opinions about how the process should *not* work but little about how it should.

Given this vacuum, it is useful to look at traditional religions and ask how their systems of ultimate meaning and ethical value have been deduced and consolidated. My sense is that each system is based on some sort of cosmology—God is in covenant with the Jews, Jesus is redeemer, the Buddha shows us the path to enlightenment—cosmologies that are rendered in poetry and art and texts and are thereby infused with meaning and value. Ethical precepts then flow from these cosmologies, whether via the direct revelation of religious visionaries or by subsequent Talmudic-like inquiry: The precepts are invariably embedded in the central account or story.

Gould is apparently not persuaded that these accounts are a valid substrate for the religious quest. In a remarkable section, he announces:

[In] the sociobiological analysis of stag and hind behavioral strategies... [t]erms such as *monopoly, advertising, budgets, efficiency, investment, value, costs, benefits, maximizing, minimizing, winning, losing* and the like are pervasive. The justification of economic language ... is rooted in the evolutionary exigency to reproduce in a competitive environment of limited resources—resources being females for stags and food for hinds.

*Images of Animals: Anthropomorphism and Animal Mind*  
Eileen Crist

Temple University Press, \$34.95



This watercolor [David Bennett’s *Roe Deer: Brimham Rocks*] ... has a narrative element that makes it more than a record of a single moment because these deer are clearly sentient animals which have appeared from the forest and are about to disappear into the forest again.

*Modern Wildlife Painting*  
Nicholas Hammond  
Yale University Press, \$50

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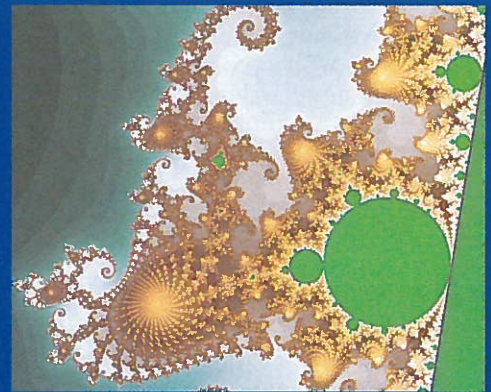
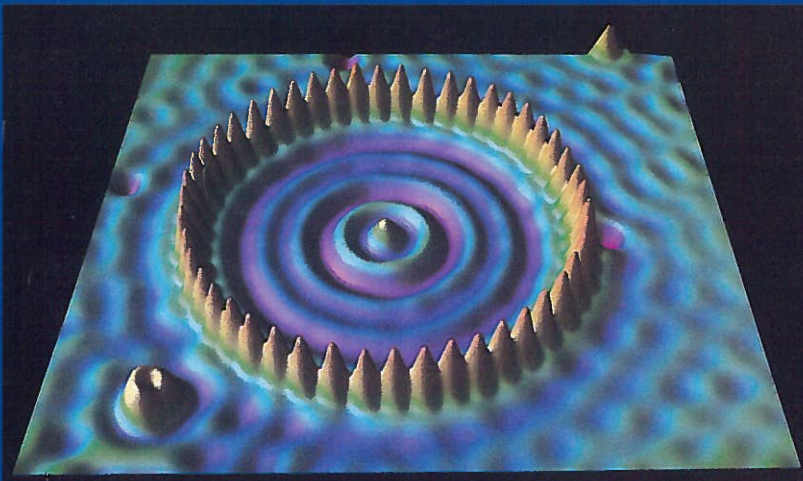
**By what criteria do we validate our moralities if we throw out revelation, authority and scientific inquiry?**

The first commandment for all versions of NOMA might be summarized by stating: "Thou shalt not mix the magisteria by claiming that God directly ordains important events in the history of nature by special interference knowable only through revelation and not accessible to science."

So much for most of the cosmology of traditional religions, called into being before scientific inquiry was available. Such a jettisoning of miracle-based cosmologies is of course the agenda of the "militant atheists" that Gould reviles. It is also the agenda of writer Ken Wilber, who states in *Marriage of Sense and Soul: Integrating Science and Religion* (1998): "If religion is to survive in a viable form in the modern world, it must be willing to jettison its bogus claims." But what is to replace them? If meaning and ethics are responses to large stories, and if our scientific understanding of nature is disallowed as a source of new stories, then where are the new stories to be found? By what criteria do we validate our moralities if we throw out revelation, authority and scientific inquiry? Wilber responds that these issues melt away once we engage in years of Buddhist meditation and discover "the reality of pure Spirit," a response that I do not find very helpful. But no more helpful is Gould's statement: "I ... construe as fundamentally

religious ... all moral discourse on principles that might activate the ideal of universal fellowship among people."

Not only does Gould refrain from identifying the tools for meaningful discourse and resolution in the magisterium of religion, but he also tells us that this discourse will generate two outcomes—ultimate meaning and moral value—that he invariably utters in the same breath. From my perspective, these outcomes relate to very different sets of propositions: Quests for ultimate meaning generate answers to "why" questions ("why is there anything at all?") that cannot be answered by science, whereas ethical quests generate answers to "how should we proceed?" questions that cannot be answered by science. Moreover, their consideration would seem to entail quite different tools of inquiry. In the end, a system of ultimate meaning involves personal beliefs and can therefore harbor whatever level of irrationality is needed. In contrast, a system of moral values entails beliefs that are generated by some sort of social discourse, meaning that their "truth" must make some sort of communal sense before it can carry the *de facto* validation of consensus. To be sure, a community can agree on the validity of "irrational" beliefs, but there is always the possibility that a doubting Thomas will hold them up to question.





Again the real difficulty is that both sets of questions must be asked and responded to in the context of an overarching cosmology. We seek the meaning of—what? The universe, life, human self-awareness, time—topics that our scientifically derived understanding has much to tell us about. Similarly, as we seek ways to generate ethical consensus, we bring to the table our concepts of human nature and the dynamics of social systems, topics about which our scientifically derived understanding also has much to report. So whereas religion may not have much of “factual” relevance to say to science, science has plenty of interesting things to say to religion: It provides much of the “what” for the “why” and “how” questions that confront us. There are, to be sure, other important inputs on offer as well, notably in the art and insights inherent in our wisdom/religious systems. But if there is a membrane separating the magisteria of science and religion, it is decidedly semipermeable. Gould is curiously self-contradictory on this point. He can write, “Science and religion must ask different, and logically distinct, questions—but their subjects of inquiry are often both identical and maximally meaningful,” and can acknowledge that nature is “bursting with relevant information to spice our moral debates.” But then he claims that ethical

questions “cannot be answered, or even much illuminated, by factual data of any kind.”

So why does Gould flip and flop here? As near as I can tell, much of the problem derives from the fact that the book attempts to make a second point, namely, that scientists are prone to commit the naturalistic fallacy—to derive “oughts” from “ises”—on a grand, overbearing scale. This point is often made with startling acrimony in an otherwise gentle text:

Scientists cannot claim higher insight into moral truth from any superior knowledge of the world’s empirical constitution.

Why shouldn’t readers view me as just another arrogant scientist ... attempting to demote religion to impotence and inconsequentiality?

NOMA places equally strong restrictions upon the imperialistic aims of many scientists (particularly in suppressing claims for possession of moral truth based on superior understanding of factual truth in any subject).

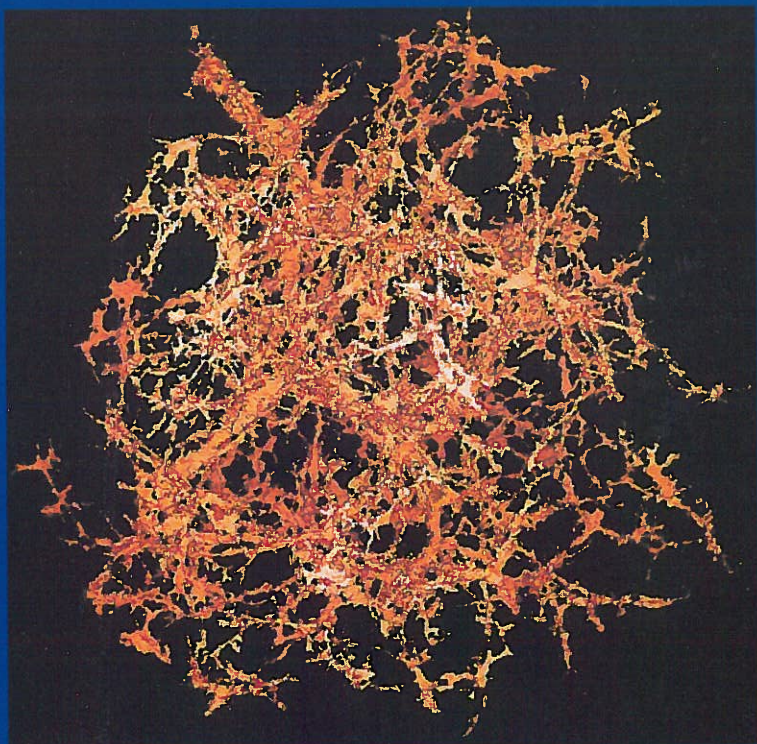
NOMA does forbid a scientific entry into fields where many arrogant scientists love to walk, and yearn to control.

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***If there is a membrane separating the magisteria of science and religion, it is semipermeable.***

## Phycasso

With *Physics in the 20th Century* (\$49.50), publisher Harry N. Abrams has finally done for Einstein, Bethe and Feynman what it did for Picasso, Pollock and Johns: turned their life’s work into a fabulous art book. Author Curt Suplee’s concise and jaunty tour of the great ideas and instruments of the past century necessarily plays second cyclotron to the glorious images, most of them made possible by perhaps the physical century’s greatest legacy: the computer. At far left, 48 atoms dance on the surface of a copper crystal, as seen through a scanning tunneling microscope. Near left, Benoit B. Mandelbrot’s famous fractal set. Right, a computer simulation of a piece of the universe.





## Birds, Bats, Career Advice



The age-old argument between social relativists and scientists, both most recently visited in the Alan Sokal context, are aired in *The Values of Science: The Oxford Amnesty Lectures 1997* (Westview, \$55). These six essays, edited by Wes Williams and introduced by Jonathan Réé, can be prissy at times but are mostly pithy and eloquent.

To learn about a gregarious and mischievous parrot that inhabits the southern mountains of New Zealand, read *Kea, Bird of Paradox* (California, \$29.95). Authors Judy Diamond and Alan Bond summarize the native flora and fauna, emphasizing the kea and the kaka, its relative. They tell how the kea has adapted to human activities and how this love-hate relationship continues.



Serious Continental birders who need to know the difference between, say, a Verreaux's eagle and a Bonelli's eagle should consult Mark Beaman and Steve Madge's *The Handbook of Bird Identification for Europe and the Western Palearctic* (Princeton, \$99.50). Like other bird books from this publisher, this is not only a useful guide but also a work of art.

I do get discouraged when some of my colleagues tout their private atheism (their right, of course, and in many ways my own suspicion as well) as a panacea for human progress against an absurd caricature of "religion" erected as a straw man for rhetorical purposes.

Who are these "many scientists"? Given the recent spate of locker-room towel-snapping published in *The New York Review of Books*, I looked for such imperialistic aims in recent books by scientists and science-popularizers—Daniel Dennett, E. O. Wilson and Robert Wright—but came up short. To my reading, these books show great respect for the magisterium of religion as Gould defines it. No question about it: Our scientific understandings of nature have on occasion been accorded the status of ultimate truth and ethical certainty by scientists and nonscientists alike, and Gould has served as an important watchdog in calling these aberrations to our attention. But to caricature "many scientists" as having "imperialist" agendas smells of "I have a list." At the least, one would have hoped that Gould would have documented these claims with the same care that he documents the statements of 19th-century theologians so that we are able to evaluate them. It would seem that much of his reluctance to celebrate the role that scientific understandings can play in informing our quest for meaning and ethics flows from his fear—unjustified among the "many scientists" I know—that scientists will somehow abuse this process.

## Pennock's Primer for Defending Science

Peter J. Bowler

**Tower of Babel: The Evidence against the New Creationism.** Robert T. Pennock. 440 pp. MIT Press, 1999. \$35.

Robert T. Pennock charts the transformation of creationism into a new movement that seeks not to set up a rival "creation science" but to undermine the credibility of the whole naturalistic methodology on which science itself is based. His book offers a useful survey of recent developments in the creationist movement and valuable advice for evolutionists trying to defend the credibility of their theory in public debates.

To close on the positive note that this book deserves, I (and, I would venture, most scientists) am in full-throated agreement with the concept at the heart of his message, that "the causes of life's history (cannot) resolve the riddles of life's meaning" and that nature

greet us with sublime indifference and no preference for accommodating our yearnings. We are therefore left with no alternative. We must undertake the hardest of all journeys by ourselves: the search for meaning in a place both maximally impenetrable and closest to home—within our own frail being.

Gould's vision of the project before us is equally rich.

To anyone who feels cosmically discouraged at the prospect of life as a detail in a vast universe not evidently designed for our presence ... consider the much greater fascination and intellectual challenge of such a mysterious but knowable universe, compared with a "friendlier" and more familiar cosmos that only mirrors our hopes and needs.

And then, the eloquent passage that first appeared in *Wonderful Life* (1989):

We are the offspring of history, and must establish our own paths in this most diverse and interesting of conceivable universes—one indifferent to our suffering, and therefore offering us maximal freedom to thrive, or to fail, in our own chosen way. ■

Pennock's title alludes to the Tower of Babel for two reasons. He uses a comparison between biological evolution and the evolution of languages to expose how the old-fashioned "young-earth creationism" is forced to deny the validity of a whole range of scientific disciplines. If the earth is less than 10,000 years old, then the vast array of human languages cannot have a natural origin (because there is not enough

*Peter J. Bowler is professor of the history and philosophy of science at Queens University of Belfast. He has written 11 books.*