RANDOM HOUSE eBOOKS

Rocks of Ages

Stephen Jay Gould

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About the Author

Stephen Jay Gould is the Alexander Agassiz Professor of Zoology and Professor of Geology at Harvard University, and the Vincent Astor Visiting Professor of Biology at New York University. His publications include *Ever Since Darwin*, *Eight Little Piggies*, *Life's Grandeur*, *Questioning the Millennium*, *Leonardo's Mountain of Clams and the Diet of Worms*, *Wonderful Life*, which won the Science Book Prize for 1991 and most recently, *The Lying Stones of Marrakech*.

ALSO BY STEPHEN JAY GOULD

Ontogeny and Phylogeny

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The Panda's Thumb

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Hen's Teeth and Horse's Toes

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Leonardo's Mountain of Clams and the Diet of Worms

Wonderful Life

Bully for Brontosaurus

The Lying Stones of Marrakech

For Jesse and Ethan,

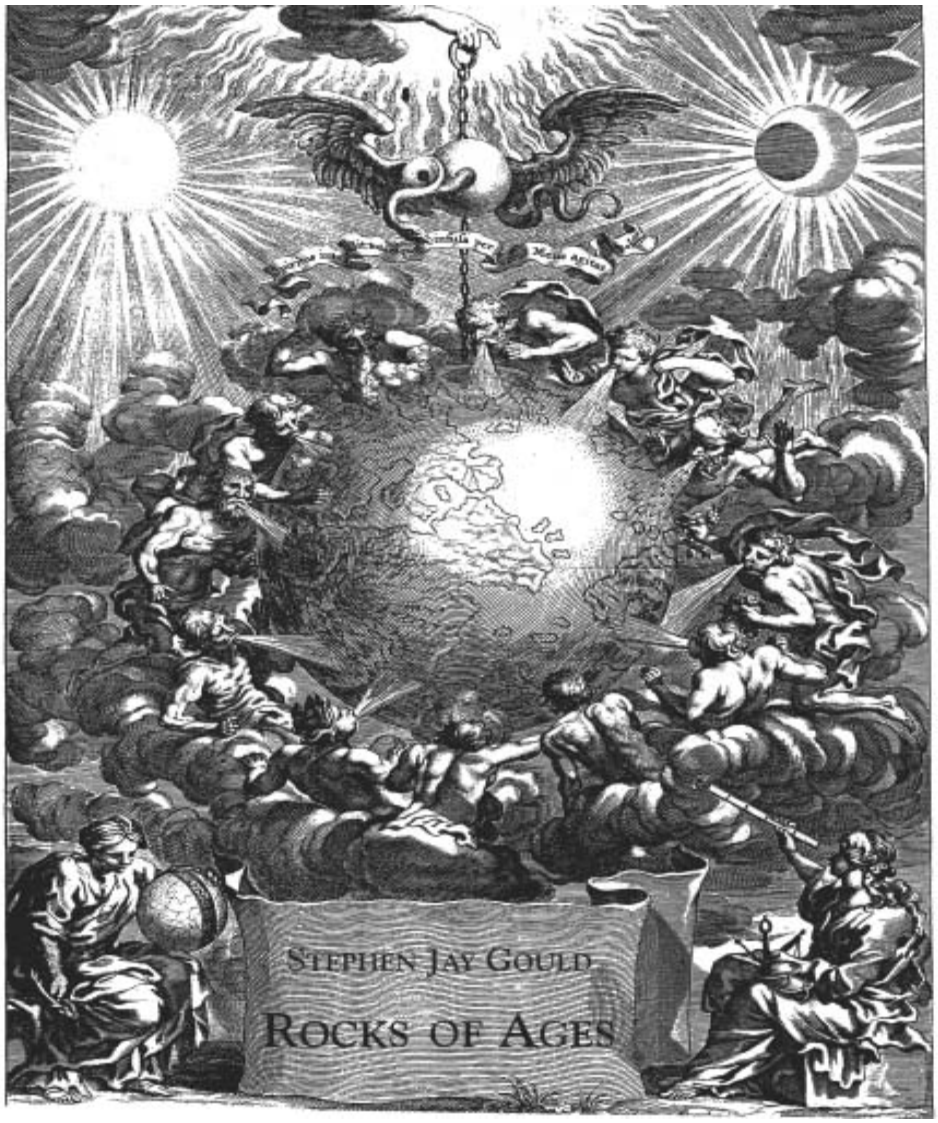
who will have to hold on beyond their father's watch, and who will surely improve a world with a future so honestly described by John Playfair, a great scientist and writer, who closed his Outlines of Natural Philosophy *(1814) by stating (in the old subjunctive mood, where his "were" equals our "would be"):*

"It were unwise to be sanguine,
and unphilosophical to despair."

Rocks of Ages

Science and Religion in the Fullness of Life

Stephen Jay Gould



The frontispiece shows the title-page illustration (modified only by a different title and author!) of the greatest geological treatise ever written by a scientist who also held holy orders—the Mundus subterraneus *(Underground World) by the great Jesuit scholar Athanasius Kircher, published in 1664. I regard the figure as a beautiful illustration of science and religion working together in their different ways. God holds the earth in space, but twelve winds in human form control both motion and climate, while the banner cites a famous line from Virgil's* Aeneid, *ending* mens agitat molem,

usually slightly mistranslated as “mind moves mountains” (moles, *accusative* molem, *refers to any massive structure)*.

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The Problem Stated

Preamble

I WRITE THIS little book to present a blessedly simple and entirely conventional resolution to an issue so laden with emotion and the burden of history that a clear path usually becomes overgrown by a tangle of contention and confusion. I speak of the supposed conflict between science and religion, a debate that exists only in people's minds and social practices, not in the logic or proper utility of these entirely different, and equally vital, subjects. I present nothing original in stating the basic thesis (while perhaps claiming some inventiveness in choice of illustrations); for my argument follows a strong consensus accepted for decades by leading scientific and religious thinkers alike.

Our preferences for synthesis and unification often prevent us from recognizing that many crucial problems in our complex lives find better resolution under the opposite strategy of principled and respectful separation. People of goodwill wish to see science and religion at peace, working together to enrich our practical and ethical lives. From this worthy premise, people often draw the wrong inference that joint action implies common methodology and subject matter—in other words, that some grand intellectual structure will bring science and religion into unity, either by infusing nature with a knowable factuality of godliness, or by tooling up the logic of religion to an invincibility that will finally make atheism impossible. But just as human bodies require both food and sleep for sustenance, the proper care

of any whole must call upon disparate contributions from independent parts. We must live the fullness of a complete life in many mansions of a neighborhood that would delight any modern advocate of diversity.

I do not see how science and religion could be unified, or even synthesized, under any common scheme of explanation or analysis; but I also do not understand why the two enterprises should experience any conflict. Science tries to document the factual character of the natural world, and to develop theories that coordinate and explain these facts. Religion, on the other hand, operates in the equally important, but utterly different, realm of human purposes, meanings, and values—subjects that the factual domain of science might illuminate, but can never resolve. Similarly, while scientists must operate with ethical principles, some specific to their practice, the validity of these principles can never be inferred from the factual discoveries of science.

I propose that we encapsulate this central principle of respectful noninterference—accompanied by intense dialogue between the two distinct subjects, each covering a central facet of human existence—by enunciating the Principle of NOMA, or Non-Overlapping Magisteria. I trust that my Catholic colleagues will not begrudge this appropriation of a common term from their discourse—for a magisterium (from the Latin *magister*, or teacher) represents a domain of authority in teaching.

Magisterium is, admittedly, a four-bit word, but I find the term so beautifully appropriate for the central concept of this book that I venture to impose this novelty upon the vocabulary of many readers. This request for your indulgence and effort also includes a proviso: Please do not mistake this word for several near homonyms of very different meaning—*majesty, majestic*, etc. (a common confusion because Catholic life also features activity in this different domain). These other words derive from the different root (and route) of *majestas*, or majesty (ultimately

from *magnus*, or great), and do imply domination and unquestioning obedience. A magisterium, on the other hand, is a domain where one form of teaching holds the appropriate tools for meaningful discourse and resolution. In other words, we debate and hold dialogue under a magisterium; we fall into silent awe or imposed obedience before a majesty.

To summarize, with a tad of repetition, the net, or magisterium, of science covers the empirical realm: what is the universe made of (fact) and why does it work this way (theory). The magisterium of religion extends over questions of ultimate meaning and moral value. These two magisteria do not overlap, nor do they encompass all inquiry (consider, for example, the magisterium of art and the meaning of beauty). To cite the old clichés, science gets the age of rocks, and religion the rock of ages; science studies how the heavens go, religion how to go to heaven.

I will examine this NOMA principle as a solution to the false conflict between science and religion in four chapters: the first, an introduction based on two stories and contrasts; the second, a characterization and illustration of NOMA as developed and supported by both institutions of science and religion; the third, an outline of historical reasons for the existence of conflict, where none should exist; and the fourth, a summary of psychological reasons for the same false conflict, with a closing suggestion for the path of best interaction.

I deplore the current penchant for literary confession, spawned by our culture’s conflation of two radically different concepts: celebrity and stature. Nonetheless, I accept that intellectual subjects of such personal salience impose some duty for authorial revelation—while the essay, as a literary genre, has been defined as discussion of general ideas in personal contexts ever since Montaigne coined the name in the sixteenth century. Let me, then, briefly state a perspective born of my own accidental ontogeny.

I grew up in an environment that seemed entirely conventional and uninteresting to me—in a New York Jewish family following the standard pattern of generational rise: immigrant grandparents who started in the sweatshops, parents who reached the lower ranks of the middle classes but had no advanced schooling, and my third generation, headed for a college education and a professional life to fulfill the postponed destiny. (I remember my incredulity when the spouse of an English colleague of “good breeding” found this background both exotic and fascinating. I also remember two incidents that emphasize the extreme parochiality of my apparent sophistication as a child on the streets of New York: First, when my father told me that Protestantism was the most common religion in America, and I didn’t believe him because just about everyone in my neighborhood was either Catholic or Jewish—the composition of New York’s rising Irish, Italian, and Eastern European working classes, the only world I knew. Second, when my one Protestant friend from Kansas City introduced me to his grandparents, and I didn’t believe him—because they spoke unaccented English, and my concept of “grandparent” had never extended beyond European immigrants.) I had dreamed of becoming a scientist in general, and a paleontologist in particular, ever since the *Tyrannosaurus* skeleton awed and scared me at New York’s Museum of Natural History when I was five years old. I had the great good fortune to achieve these goals and to love the work with fully sustained joy to this day, and without a moment of doubt or any extended boredom.

I shared the enormous benefit of a respect for learning that pervades Jewish culture, even at the poorest economic levels. But I had no formal religious education—I did not even have a bar mitzvah—because my parents had rebelled against a previously unquestioned family background. (In my current judgment, they rebelled too far, but opinions on such questions tend to swing on a pendulum from one

generation to the next, perhaps eventually coming to rest at a wise center.) But my parents retained pride in Jewish history and heritage, while abandoning all theology and religious belief. (The Holocaust claimed most of both sides of my family—nothing directly personal, for I knew none of these relatives—so denial and forgetfulness could not have been an option for my parents.)

I am not a believer. I am an agnostic in the wise sense of T. H. Huxley, who coined the word in identifying such open-minded skepticism as the only rational position because, truly, one cannot know. Nonetheless, in my own departure from parental views (and free, in my own upbringing, from the sources of their rebellion), I have great respect for religion. The subject has always fascinated me, beyond almost all others (with a few exceptions, like evolution, paleontology, and baseball). Much of this fascination lies in the stunning historical paradox that organized religion has fostered, throughout Western history, both the most unspeakable horrors and the most heartrending examples of human goodness in the face of personal danger. (The evil, I believe, lies in the frequent confluence of religion with secular power. Christianity has sponsored its share of horrors, from inquisitions to liquidations—but only because this institution held great secular power during so much of Western history. When my folks held such sway, more briefly and in Old Testament time, we committed similar atrocities with the same rationales.)

I believe, with all my heart, in a respectful, even loving, concordat between the magisteria of science and religion—the NOMA concept. NOMA represents a principled position on moral and intellectual grounds, not a merely diplomatic solution. NOMA also cuts both ways. If religion can no longer dictate the nature of factual conclusions residing properly within the magisterium of science, then scientists cannot claim higher insight into moral truth from any superior knowledge of the world’s empirical constitution. This mutual

humility leads to important practical consequences in a world of such diverse passions. We would do well to embrace the principle and enjoy the consequences.

A Tale of Two Thomases

The disciple Thomas makes three prominent appearances in the Gospel of John, each to embody an important moral or theological principle. Nonetheless, these three episodes cohere in an interesting way that can help us to understand the different powers and procedures of science and religion. We first meet Thomas in chapter 11. Lazarus has died, and Jesus wishes to return to Judaea in order to restore his dear friend to life. But the disciples hesitate, reminding Jesus of the violent hostility that had led to a stoning on his last visit. Jesus, in his customary manner, tells an ambiguous little parable, ending with the firm conclusion that he will and must go to Lazarus—and Thomas steps forth to break the deadlock and restore courage to the disciples: “Then said Thomas . . . unto his fellow-disciples, Let us also go, that we may die with him.”

In the second incident (chapter 14), Jesus, at the Last Supper, states that he will be betrayed, and must endure bodily death as a result. But he will go to a better place and will prepare the way for his disciples: “In my Father’s house are many mansions . . . I go to prepare a place for you.” Thomas, now confused, asks Jesus: “Lord, we know not whither thou goest; and how can we know the way?” Jesus responds in one of the most familiar Bible passages: “I am the way, and the truth, and the life: no one cometh unto the Father, but by me.”

According to legend, Thomas led a brave life after the death of Jesus, extending the gospel all the way to India. The first two biblical incidents, cited above, also display his admirable qualities of bravery and faithful inquiry. Yet we know him best by the third tale, and by an appended epithet of criticism—for he thus became the Doubting Thomas of our languages and traditions. In chapter 20, the resurrected Jesus appears first to Mary Magdalene, and then to all the disciples but the absent Thomas. The famous tale unfolds:

> But Thomas was not with them when Jesus came. The other disciples therefore said unto him, We have seen the Lord. But he said unto them, Except I shall see in his hands the print of the nails, and put my finger into the print of the nails, and thrust my hand into his side, I will not believe.

Jesus returns a week later to complete the moral tale of a brave and inquisitive man, led astray by doubt, but chastened and forgiven with a gentle but firm lesson for us all:

> Then came Jesus, the doors being shut, and stood in the midst and said, Peace be unto you. Then saith he to Thomas, Reach hither thy finger, and behold my hands; and reach hither thy hand, and thrust it into my side: and be not faithless, but believing. And Thomas answered and said unto him, My Lord and my God.

(This last passage assumes great importance in traditional exegesis as representing the first time that a disciple identifies Jesus as God. Trinitarians point to Thomas's utterance as proof for the threefold nature of God as Father, Son, and Holy Ghost at the same time. Unitarians must work their way around the literal meaning, arguing, for example, that Thomas had merely uttered an oath of astonishment, not an identification.) In any case, Jesus' gentle rebuke conveys the moral punch line, and captures the fundamental difference between faith and science:

> Jesus saith unto him, Thomas, because thou hast seen me, thou hast believed: blessed are they that have not seen, and yet have believed.