

RELUMINATING THE ENLIGHTENMENT—AND DOING IT POSITIVELY: OTHER VOICES

FEATURE

“I would like now to turn to a third value that science has....The scientist has a lot of experience with ignorance and doubt and uncertainty, and this experience is of very great importance, I think. When a scientist doesn't know the answer to a problem, he is ignorant. When he has a hunch as to what the result is, he is uncertain. And when he is pretty darn sure of what the result is going to be, he is in some doubt. We have found it of paramount importance that in order to progress we must recognize the ignorance and leave room for doubt. Scientific knowledge is a body of statements of varying degrees of certainty—some most unsure, some nearly sure, but none absolutely certain.

“Now, we scientists are used to this, and we take it for granted that it is perfectly consistent to be unsure—that it is possible to live and not know. But I don't know whether everyone realizes that this is true. Our freedom to doubt was born of a struggle against authority in the early days of science. It was a very deep and strong struggle. Permit us to question—to doubt, that's all—not to be sure. And I think it is important that we do not forget the importance of this struggle and thus perhaps lose what we have gained. Here lies a responsibility to society.”

—Richard Feynman, “The Values of Science,” in *The Pleasure of Finding Things Out* (Perseus, 1999), p. 146.

“Terry Smith's letter on religious barriers to scientific understanding (June 1991 *PT*, p. 145) struck a familiar chord. This problem arises in my liberal-arts physics class, usually in connection with Big Bang cosmology and with the radioactive dating of the Earth.

“The problem is worst in biology, where 53 percent of our high school graduates and 46 percent of our college graduates reject one of the field's guiding principles, namely evolution [cites reference]... “This matter must be confronted directly, explicitly but tactfully in classes and in textbooks. But students must not feel that their beliefs are being attacked, for they will, as Smith points out, stop thinking. The proper approach is really the one that is most in accord with scientific methodology: Present the evidence, have an open class discussion with all views encouraged, and let students make up, or not make up, their own minds. We must be respectful of

religion in general and, above all, humble. We should be aware that science is limited, that science's products (such as nuclear weapons) are often tragically in need of the kind of guidance that religion can provide, and that the Bible contains profound truths that are sometimes expressed in literary and symbolic form.”

—Art Hobson, University of Arkansas-Fayetteville, letter to *Physics Today*, April 1992, p. 120.

“Recently, some political and educational groups have attempted to undermine the importance of teaching the concepts of biological and cosmological evolution, thereby rejecting the consensus of the scientific community. Ideas about the structure and evolution of the universe, including Earth and its life forms, are unifying concepts in science. The development of students' informed views about these concepts is essential to a knowledge of science. These concepts should therefore be included and emphasized as a part of science frameworks and curricula for all students.

“The Society of Physics Students (SPS) recognizes that decisions about science education standards are the purview of state and local authorities; however, the position of SPS is that such decisions should involve education experience and scientific expertise, and be based on the body of research in science, pedagogy, and cognitive development. SPS encourages science educators and scientists to participate in the development of science education standards by involving themselves in the decision-making processes of state and local school boards.”

—2003 SPS Statement on Evolution and Science Education

“...Third, no factual discovery of science (statements about how nature “is”) can, in principle, lead us to ethical conclusions (how we “ought” to behave), or to convictions about intrinsic meaning (the “purpose” of our lives). These last two questions—and what more important inquiries could we make?—lie firmly in the domains of religion, philosophy, and humanistic study. Science and religion should be equal, mutually respecting partners, each the master of its own domain,

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and with each domain vital to human life in different ways.”

—**Stephen Jay Gould, “Dorothy, It’s Really Oz,”**
Time, August 23, 1999, p. 59.

“The Council of the American Physical Society opposes proposals to require ‘equal time’ for presentation in public school science classes of the biblical story of creation and the scientific theory of evolution.... [The] ability to construct critical experiments, whose results can require rejection of a theory, is fundamental to the scientific method. While our society must constantly guard against oversimplified or dogmatic descriptions of science in the education process, we must also resist attempts to interfere with the presentation of properly developed scientific principles in establishing guidelines for classroom instruction or in the development of scientific textbooks. We therefore strongly oppose any requirement for parallel treatment of scientific and non-scientific discussions in science classes. Scientific inquiry and religious beliefs are two distinct elements of the human experience. Attempts to present them in the same context can only lead to misunderstandings of both.”

—**APS Statement on Creationism, *Physics Today*, Feb. 1982, p. 54, sidebar to a news article called “Mainstream scientists respond to creationists.” This article and the APS Statement stimulated a lengthy sequence of letters to the editor over the next couple of years.**

“As a physicist who is also interested in religion, I am irritated whenever I find that the spokespersons for religion are anti-intellectual fundamentalists, while often the spokespersons for science are militant atheists. By airing these extreme positions, the ancient science/theology dispute is carried forward, and continued misunderstanding is promoted. Most of the public, who are neither scientists nor theologians, feel that they must choose one or the other model of the universe. The implications for political decisions and the funding of scientific research are obvious.”

—**Harry Ellis, Eckerd College, letter to *Physics Today*, October 1982.**

“Broadly speaking, religion and science can live harmoniously together in the human soul so long as each respects the other’s autonomy, so long as neither claims infallibility. Conflicts occur when organized science or organized religion claims a monopoly of truth...”

“...as I listen to the arguments raging in recent years between biologists and creationists over the teaching of biology in American schools, I am shocked to hear voices among the biologists sounding as arrogant and intolerant as the voices of the creationists....[The] biologists, by and large, show no

respect or understanding for the human anguish of the parents. The biologists say with a tone of contempt: ‘Your religious beliefs are no concern of ours. There is only one right way to teach biology in schools, and we decide how to teach it because we are the experts and we know what is true.’ The biologists, in other words, are claiming to be as infallible as the Pope. This is a tragedy for both sides in the dispute. It is tragic for the parents to have their deep religious convictions over-ridden by a group of arrogant experts. And it is tragic for the biologists to present to the parents a false image of science, an image of intolerance and insensitivity, and thereby to raise a generation of citizens who consider science to be their enemy....”

“The conflict between creationists and evolutionists is a sorry chapter in the history of science and religion. In such conflicts the worst elements on both sides come to the fore. What begins as a simple human tragedy ends as a grotesque legal squabble in which lawyers on each side try to prove the other side wrong. The children, over whose hearts and minds the battle is fought, need to see that there is good on both sides, that both their parents’ faith and the wider vision of science are worthy of respect...”

—**Freeman Dyson, “Science and Religion,”**
Statement to the Committee on Human Values, National Conference of Catholic Bishops, Detroit, MI, Sept. 16, 1986. This speech was expanded into the book *Infinite in All Directions* (Harper Collins, 1988).

‘I agree that those who present religious belief as viable scientific theory should be set straight, but I cannot look on mocking refutation of religious faith with respect.’

—**Rodney Hall, University of Iowa, letter to *Physics Today*, January 1983.**

“I do not think, however, that the dogmatic attitudes that led to this controversy becoming a cause for legal action are all on the side of the religious fundamentalists. Some widely read popularizers of evolutionary biology make no secret of their materialism and, indeed, use their popular writing as a means of propaganda for their world view. Even if, in their own minds, their belief in evolution is related to their unbelief in God, the one does not logically entail the other. It is hardly surprising, however regrettable, that some adherents of Christianity have retaliated by trying to cast doubt on the scientific theory that has been used as an instrument of propaganda outside its sphere of applicability.”

—**Alan H. Batten, National Research Council,**
letter to *Physics Today*, April 1983.

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“Religion doesn’t exist primarily to explain the world, but to help us make peace with it....And more generally, science and religion...may inform each other, but they are not the same thing. One is about how the world works, the other is about how to live in it. Indeed, people who attack scientific findings on religious grounds are being foolish. The Earth’s age has no more to do with their salvation than the atomic weight of tin.”

—Richard W. Fox, “Science in a Postmodern World,” *Mercury (Astronomical Society of the Pacific)*, October 2005, p. 47.

“We should by now be used to strange thoughts....Albert Einstein published the scientific papers that taught us that gravity bends light, that space and time are warped, that matter and energy are interchangeable...”

“But there is a not-at-all-strange reason that a Washington columnist would belabor Miami graduates with strange facts. It is this: The more they appreciate the complexity and improbability of everyday things—including themselves—the more they can understand the role that accidents, contingencies, and luck have played in bringing the human story to its current chapter. And the more they understand the vast and mysterious indeterminacy of things, the more suited they will be to participate in writing the next chapter.

“This is so because the greatest threat to civility—and ultimately to civilization—is an excess of certitude.”

—George F. Will, “The Oddness of Everything,” *Newsweek*, May 23, 2005, p. 84.

“‘Is that true?...Let me think about it. Maybe I should change my mind...’ When is the last time you can honestly remember a public dialogue, or even a private conversation, that followed that useful course? To shy away from rigorous intellectual engagement is not new for undergraduates; in 1998 a study done by an anthropologist at Grinnell College reported the most common discussion model among students was stating what they were certain they already believed, not learning what they did not or exploring the views of those with whom they disagreed...”

“But what was once the comfort level of 18-year-olds has now become the guiding principle of a nation, with ease to be found only among the like-minded. Today’s graduates have also learned that having strongly held beliefs means expressing contempt for those of others...”

—Anna Quindlen, “Life of the Closed Mind,” *Newsweek*, May 30, 2005.

“Scientific materialism is at the opposite end of the theological spectrum from biblical literalism. But they share several characteristics that lead me to discuss them together. Both

believe that there are serious conflicts between contemporary science and classical religious beliefs. Both seek knowledge with a sure foundation—that of logic and sense data, in the one case, that of infallible scripture, in the other. They both claim that science and theology make rival literal statements about the same domain, the history of nature, so that one must choose between them.

“I will suggest that each represents a misuse of science. Both positions fail to observe that proper boundaries of science. The scientific materialist starts from science but ends by making broad philosophical claims. The biblical literalist moves from theology to make claims about scientific matters. In both schools of thought, the differences between the two disciplines are not adequately respected.”

—Ian Barbour, *Religion in an Age of Science* (Harper, 1990), p. 4.

“The real problem that confronts us, and it is a great problem, is how to adjust religion to science, faith to knowledge, ideality to reality, for adjustment in the reverse direction will never happen. Facts cannot be eliminated by ideals and it is too late in the history of the world to attempt to refute the findings of science by sentimental objections or supposed theological difficulties. If science makes mistakes, science must furnish the cure; it can never be done by church councils, state legislatures, nor even by popular vote.

“The only possible remedy for the present deplorable condition is not less but more and better science and education; science that recognizes that the search for truth is not the whole of life, that both scientific reality and religious ideality are necessary to normal, happy, useful living. We must keep our feet on the ground of fact and science, but lift our heads into the atmosphere of ideals...”

—Edwin Grant Conklin

“The aim of a liberal education is not to turn out ideal dinner guests who can talk with assurance about practically everything, but people who will not be taken in by men who speak about all things with an air of finality. The goal is not to train future authorities, but men who are not cowed by those who claim to be authorities. The alternative to gullibility, is not lack of respect for competence but the ability to find out who is competent and who is not.”

—Walter Kaufmann, “The Faith of a Heretic” (Doubleday & Co., 1963), p. 22.

“There lives more faith in honest doubt,
Believe me, than in half the creeds.”

—Tennyson, “In Memoriam”

