

lar environment. This may have implications for the question of the origin of life.

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Does Religion Prize Mislead Scientists?

The Templeton Prize for Progress in Religion (see, for example, *PHYSICS TODAY*, May 2000, page 53) may have an undesirable consequence for science. The prize (with exceptions) goes to those who try to create commonality between religion and science, but it may also lead some scientists to compromise their integrity.

When scientists who never wrote a word about religion are suddenly writing books about “god particles” and the like, it indicates to me that the authors consider integrity to be a convenience, truth to be malleable, and both to be subservient to money. Why, then, should anyone trust their research?

The subjects of rigorous intellectual pursuit can be divided into three major categories: science, philosophy, and religion. Religion is based on belief in certain tenets: a god or gods with certain attributes, a priest or seer who can dictate the will of the deity, and perhaps a book of divine laws. Such beliefs do not preclude the use of logic by believers, and a rational investigation of the observable universe can be made based on these beliefs, as can attempts to address philosophical questions. However, if a conflict arises between religious beliefs and the rational implications of those beliefs, or between belief and observation, it is logic or observation that must be perceived as wrong. As an example, given what we know of human physiology, we understand that there is no virgin birth in humans because conception requires

the joining of sperm and egg. Yet Christians believe in virgin birth and therefore, to the believer such an occurrence must be possible, scientific considerations notwithstanding. Questioning the belief is not permitted. In brief, a defining principle of religion is that its fundamental tenets are accepted by its followers to be true beyond question.

In philosophy, axioms and rules of logic are fundamental. These may vary depending on the specific topic being addressed and may be investigated using yet other rules and axioms. The subject of an investigation may be religion and the observable universe, but if a conflict occurs then all elements—the beliefs, the rules of logic, and the axioms—may be questioned, because only the use of a logical system is fundamental to philosophy.

Science is based on observation. And a logical structure is created to describe and unite observations. A defining principle of science is that any conflict between observation and logic or between observation and religious belief, is resolved in favor of repeated observations.

I do not mean to propose that we have evolved religion, science, and philosophy in quarantine from each other or from other intellectual activity—art, for example. Yet it appears that science cannot and does not address religious questions at all. The truth of religious belief, by definition lacking any fundamental connection with observation, cannot be meaningfully evaluated by scientific methods. Nor can the truth or reality of scientific principles be meaningfully evaluated by applying the tenets of a religion, based as the latter is on belief.

Within each category, questions may arise that cannot be adequately answered by referral to the category’s basic tenets. An individual may perhaps resolve such questions to his own satisfaction by taking refuge in other tenets. However, if a scientist chooses to accept as a matter of faith that Planck’s constant is a fundamental quantity, this does not make science a religion, nor imply that religion and science share some fundamental commonality. A religious believer may similarly accept observations as true, but this does not make his religion a science.

Particularly in the context of ongoing attempts by American religious conservatives to infuse public

education with their religion, it seems to me that the Templeton Prize is little more than an incentive for them to continue such an effort. It also is a bribe—one that has successfully lured more than one well-known scientist into becoming a spokesman for the right-wing religious cause.

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Szilard Endorsed Nuclear Medicine by Example

The excellent review of radionuclide therapy by Bert M. Coursey and Ravinder Nath (*PHYSICS TODAY*, April 2000, page 25) reminded me of a story I heard while conferring with the late Jonas Salk on his controversial idea of using an HIV vaccine to treat AIDS.

Leo Szilard, who is best known for obtaining an early patent on the fission bomb (as a method of “producing new elements”), was diagnosed with bladder cancer. Standard treatment consisted of surgery to debulk the tumor along with the in situ use of bacillus Calmette–Guerin (BCG), a tuberculosis vaccine, to stimulate the immune system. Apparently, Szilard declined this treatment and instead accepted radiation therapy. The way I heard it, Szilard consulted with Salk, celebrated for developing the first polio vaccine, and Szilard subsequently had a radioactive sliver implanted in his bladder. The procedure apparently helped cure his cancer.

I have no way of knowing how much of this story is accurate. But it would be interesting if the inventor of the atomic bomb had made a personal choice that served to encourage the medical use of radioactive isotopes. More recently, the term “nuclear magnetic resonance” had to be changed to “magnetic resonance imaging” because the public tends to think of anything “nuclear” as inherently dangerous. At least Szilard would have had a better perspective on what is and isn’t dangerous.

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