

ple (as well as Chinese and Indian people), but even more importantly, the public's understanding of science is not always congruent with the reality of the scientific experience. Fox questions the veracity of my statement "This process of investigation called science is not value neutral, nor is it culturally independent; furthermore, there can be no ultimate objectivity." Like so many ill-informed or disinformed people involved in science, he still believes the myth that value neutrality and objectivity are the inherent and defining features of science.

My statement is neither radical nor on the fringe or pseudoscientific. For example, the 1989 National Academy of Sciences publication "On Being a Scientist" states: "Researchers continually have to make difficult decisions about how to do their work and how to present it to others. Scientists have a large body of knowledge that they can use in making these decisions. Yet much of this knowledge is not the product of scientific investigation, but instead involves value-laden judgments, personal desires, and even a researcher's personality and style." The authors also point out that "historians, sociologists, and other students of science have shown that social and personal values unrelated to epistemological criteria—including philosophical, religious, cultural, political, and economic values—can shape scientific judgment in fundamental ways." I would add values regarding gender and ethnicity.

In my essay I outlined the role and type of values and the personal, social and ecological contexts in which African people of ancient Egypt performed their "scientific" knowledge quests. Their theoretical and applied "technics" revolved around a strong moral and philosophical integrative framework known as "Ma'at." Fox avoids discussing that topic.

Fox apparently finds the inextricable linkage between the history of science of the Western world and that of the Eastern world extremely troubling. James Burke's PBS television series and books *Connections* and *The Day the Earth Changed* clearly show how science and technology's developmental course has been nonlinear, serendipitous and interwoven in the histories and lifeways of different cultures over time.

If Fox means to insinuate that I claimed Isaac Newton plagiarized his theory of gravitation, I can only say that nothing could be further from the truth. But no matter what people discover, create or innovate, they stand on the shoulders of giants before

them. No reputable historian could deny the significant influence Egypt had on the development of science and philosophy among the ancient Greeks, or the later impact the scientific and technological discoveries and inventions of the inheritors of that Hellenistic tradition—African and Islamic scholars—had on European science following Europe's "dark ages." I would recommend that Fox review Seyyed H. Nasr's *Islamic Science: An Illustrated Study* (Westerham, 1976) and Martin Bernal's *Black Athena: The Afro-Asiatic Roots of Classical Civilization*, volumes 1 and 2 (Free Association Books, 1989, 1991).

Fox lastly categorically dismisses all the Portland *Baseline Essays* because of their "absence of balance, accuracy and scholarship." I would hope that those "knowledgeable scientists, educators and organizations" that Fox patronizingly suggests should "scrutinize [multicultural curricular] materials and offer constructive alternatives" do not follow Fox's path toward divisiveness, but rather bring a strong measure of intellectual honesty to the task. The Organization of American Historians, in a recent position paper, acknowledged history as an interpretive discipline. In this case, whose interpretation of the history of science or of any ethnic group's knowledge would be the authoritative one? Who would decide? Could there be one "correct" view for all time? Who would decide which people and organizations would have the task of developing alternative views? Who would decide which "constructive alternatives" to the *Baseline Essays* would be adopted, and who would determine their content?

In conclusion, what is called for is more intellectual humility and less knee-jerk reaction to information that is not congruent with one's learned social history and education. As Lorenzo Simpson, professor of philosophy at the University of Richmond, poignantly observes in his article "Science, Language, and Experience: Reflections on the Nature of Self-Understanding" (*Man and World* 16, 25, 1983), "we must risk who we think we are, what we take the meaning of our experience to be, in order to be in possession of who we are."

The *Baseline Essays* are currently being reviewed and revised, as was always planned. The biographical data given could be misinterpreted: I am an independent research scientist at the Lifeways Sciences Institute in Chicago, not at Argonne National Laboratory.

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1/92

Culture, Values and the Wish to Learn Science

The letters and articles on the dismal situation in science education in this country (mostly by people who have never taught high school science) deserve, I think, a few comments from one who has been in various systems, from Catholic schools and suburban public schools to inner-city schools and schools in Nigeria, since 1956.

I agree with most of the criticisms of science education in this country: It is dull, test oriented, theoretical and text oriented; it lacks "hands on" work; and so on. And I don't believe that students are just too "lazy" to do the work demanded in a serious science course. There is another factor that is overlooked: *Perhaps some students just aren't interested in science, no matter what we do to capture their interest.*

I am thinking of two groups that are often focused on: women and minorities. No matter how much fun science is in primary and middle school, there comes a time when serious choices have to be made. The question is, Just how relevant is science as a *career* to women and minorities (or, for that matter, to males of the "majority")?

My female students have usually been my best students in physics and chemistry, especially among my minority students. By "best" I mean they have the highest test scores and do very well in the lab. But they don't continue in science. While physics may be "interesting" to these students, it is also—especially on the theoretical level—quite irrelevant: a game played by overgrown adolescent males (as is math). There are more important things in life. And the large percentage of women in the health sciences bears witness to this attitude.

Minorities have other concerns (and not just socioeconomic) that do not make quantum electrodynamics and the Super Collider very relevant. In every system I have taught in, there is a religious value system that the students (and their parents) see as inimical to science. As a former Jesuit priest I have encountered on every level the question "How can you be religious and teach science?" Almost every year a minority woman will present me with a little "gift," usually a tract on creationism. And you don't have to be a fundamentalist to be critical of science. One professor at a Midwestern university reported that close to 50% of his science education students thought that creationism was a "reasonable alternative to evolution."

There are few examples of real

scientists who are believers, and hardly any who are practicing Christians. This is compounded among minorities. Both African-American and Hispanic students are religiously oriented, and their religious values are an integral part of their culture.

I have lectured and written about the role science could play in our religious lives: how science can better our living conditions and teach us more about the Creator. But by and large, the students are not impressed. There are, after all, only a few short years here until we attain eternal life: Why bother with playing games? And even so-called nonbelievers have the lingering spirituality of their families' traditional religious dedication. Add in all the other typically American "fads," from parapsychology to the popularity of the ridiculous tabloids, and you have an environment that is not exactly favorable to true science.

The exceptions to the religious norm are the Jews and Asians. Jewish culture encourages questioning. Jews "argue" with God! They can't understand the meek acceptance of "God's will" among Christians. The outstanding Jewish scientists may not be believers, but they were inspired by their believing parents. Many Asians have a similar background. But it is obviously not genetic. Filipinos and Indonesians—devout Catholics and Muslims—are not outstanding in the sciences.

I have two very long essays on these problems readers might be interested in. One of my points is that "secular humanism" is a form of religion. Copies will be sent upon request.

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10/90

Physicists, Ethics and the Iowa Shooting

I applaud the recent efforts of the Panel on Public Affairs of The American Physical Society to formulate guidelines for professional conduct (January, page 62). We face no fewer temptations than other, less exalted segments of society. However, some still feel it unthinkable that a physicist could be unethical. This attitude may be responsible for the headline in the December Physics Community section (page 60), "Shooting at University of Iowa Claims Four Physicists, Administrator." A careful count reveals that five of us were shot, including the perpetrator.

STEPHEN C. LANGFORD

Washington State University

Pullman, Washington ■

1/92



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