

ities ready for calculus at the end of high school reminded me of Wilt Chamberlain's remark that had he known he had such an innate advantage for athleticism, he wouldn't have wasted so many thousands of hours practicing.

Socialization may be of some use in explaining lower participation rates in high school math by some groups in the US, but it no more *excuses* not taking math than it does getting pregnant, becoming involved with drugs or violent crime, or totaling cars while drunk. If one listed the things American high schoolers have to deal with, math might be among the more threatening to their self-images. But when so many of the other things on the list involve a far greater risk of immediate negative consequences as a result of irrational decisions, it's hard to understand avoiding math.

The most serious drawbacks of our high school mathematical education may stem from problems further along: Hardly any of the students with four years of high school math end up getting PhDs, and of those who do, only 18% get grants to help them in the process. Years of headlines about the majority of junior faculty in this country being from abroad have done little to shift the attention of universities from installing computer networks to altering the mix of students to whom they give graduate degrees. The fact that Japan has about half again as many researchers in high-temperature superconductors has not prompted the sort of outpouring of Federal subsidies for graduate education that came after Sputnik, even though Japanese electronics manufacturers are a far more serious threat to the economy.

DON OLLIFF

11/90

Oxnard, California

NAPPI REPLIES: I fully agree with Daniel Zwanziger's letter.

In response to Tannie Stovall, I would reiterate that my point was that the more gradual and systematic approach to math and science teaching adopted in European schools makes these subjects more accessible than the "hit and run" approach used in American schools does. This opinion is shared by many American educators and researchers. (See the report on the National Science Teachers Association's new curriculum in *PHYSICS TODAY*, October 1990, page 87.) It may be the case that the French school system has its own problems, but surely concentrating all the physics or algebra in a one-year crash course would only make it worse.

In considering the question of the schools as social equalizers, I will concentrate on my experience of having been born and educated in Italy. In Italy, all schools are virtually free, from nursery school (for children above three years of age) to college (where the enrollment fee, which is very small compared with American standards, is waived in case of hardship, and students from low-income families are eligible for scholarships). The quality of education is controlled at the state level and, to a very good approximation, is independent of the specific school district: Schools are financed by the state, the curriculum is the same all over the country, and all teachers have to pass the same state exam.

Finally, returning to the issue of women in math and science (as well as in any other profession), women in Italy get paid maternity leave. This fact, together with the availability of affordable day care at a charge that depends on the family income, helps to explain the high percentage of women in scientific professions and in the job market in general, and is of invaluable importance especially to low-income families. (For a description of the similar positive effects of day care at Argentinian universities, see Akhlesh Lakhtakia's letter in *PHYSICS TODAY*, December, page 94.)

CHIARA R. NAPPI

*Institute for Advanced Study
Princeton, New Jersey*

3/91

Physics Deported at Portland State

The pages of *PHYSICS TODAY* have reported that one-third of US high schools do not offer physics.

Now a US university is suspending its bachelor's degree program in physics.

The Oregon state system of higher education is currently being decimated—in the literal meaning of that term—by mandated budget cuts. In reacting to this mandate, Portland State University has proposed to eliminate its undergraduate programs in applied science. Also marked for suspension is the undergraduate program in physics.

I challenge physicists to consider the implications of a *university* not offering a major in physics!

While I am not employed at Portland State—I work over a hundred miles away, at the University of Oregon—I am horrified by the contempt this shows for one of man's highest intellectual achievements. I am disgusted by the mentality

that seems to want more VCRs but doesn't give a thought to knowing how they work!

Currently both the City of Portland and the State of Oregon are attempting to build upon the core of electronics and high-technology industries in the Willamette Valley. Perhaps the administrators of these entities should be made aware of the message being sent by the elimination of physics from a university curriculum.

Further information on this matter can be obtained from the appropriate agency administrators; addresses may be obtained by contacting the office of Governor Barbara Roberts, 254 State Capital, Salem OR 97310, phone (503) 378-3111.

PAUL ENGELKING

2/91

Lowell, Oregon

Religion and Science: Worldviews Collide

The participants in your forum on physics literacy (November 1990, page 60) discussed various barriers to public understanding of science in general and physics in particular. I was surprised that none of your panelists mentioned one of the biggest problems a significant fraction of the public has with science: It conflicts with their religion. Gerald Holton, in outlining parts of a typical layman's scientific world picture, did state that the layman believes that "the pattern of cause and effect works most of the time, but incomprehensible and magical things do occasionally intervene."

All too often, when engaged in a discussion of some scientific topic with people who have no scientific training, I am unable to keep the discussion purely scientific because they insist on dragging in the subject of religion. To these people, religion is an integral part of their view of nature and it is meaningless to attempt a discussion of science without involving religion.

Usually such people inject religion into the dialogue whenever biological evolution or the age of the Earth is touched upon. When this happens it is useless to continue the conversation: Science is necessarily wrong, since it contradicts their dogmatic beliefs.

I wish I had a constructive suggestion to make here. It will probably make some readers uncomfortable for me to say this, but the truth is that certain religious beliefs may be barriers to the general population's understanding of science.

TERRY SMITH

12/90

New Market, Alabama ■