

LETTERS

Editor's Comments: *There have been many responses to my note in the July issue requesting reader reactions to the transition from a quarterly hard-copy "Physics and Society" to the publication of a semi-annual hard copy version plus a semi-annual web version. (The paper issues are always accompanied by a web version and all issues are announced by e-mail to all members containing a complete table of contents.) The overwhelming number of responses from readers has been negative; a sample is given below. There has also been some negative reaction from potential authors, saying they would rather have their contributions appear in the hard-copy issues. The gist of these replies is that this journal is read differently than a research journal – it is browsed in relaxing times and places; it is not relaxing to browse from a computer screen. Never-the-less, financial constraints being what they are, it seems unlikely that we will soon go back to a paper quarterly, even though many correspondents volunteered to make an annual contribution to offset the additional costs of the two extra paper issues per year (~\$4000 per paper issue). Our Electronic Media Editor, Marc Sher, has gone to great lengths to make it easy to print out each web issue, in parts and totality. I hope the regular members of the Forum will get used to this format, continue and expand their readership, use this journal to enhance their membership in the Forum, indeed extend our membership. (I don't know what our library subscribers will do.)*

Reading P&S is Pleasurable But Not a High Priority

Your editorial in the July 2001 issue of Physics and Society demonstrates that you have discovered one of the major problems with net publication. That is, that readers are by and large (except for high school web freaks) busy individuals who use their precious time logged in front of a terminal for their highest priority tasks. Reading for pleasure means that one can pick up and put down publications at will as the time permits, in whatever setting is available – in front of the fireplace, on an airplane or train, in the backyard, or in a taxi. Being constrained to a computer, until truly universal wireless remote access is as easy as reading a newspaper in a cab, will not encourage people to read publications such as P&S on the web when they have higher priority tasks at hand.

Thank you.

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More on Alice Stewart

I am writing in response to the Jan. 2001 issue of P&S review of the book by Gayle Greene on the life of Dr. Alice Stewart. While Dr. Stewart's early work was creditable and important, about 30 years ago she became one of the tiny minority of scientists who diverged sharply from the vast majority of their colleagues and took the position that the mainstream scientific community was grossly under-estimating the cancer risk from low-level radiation. In fact Dr. Stewart has carried her case further by alleging personal improprieties by well respected scientists, motivated by gender-bias.

Gayle Greene is a Professor of Women's Studies and Literature with principal research activities in Shakespeare, women writers, and feminist issues. She has no expertise in science. Her book is based on interviews with Dr. Stewart and others with her anti-Establishment views. In fact the author admits that she didn't spend much time with people on the other side of the controversies. She interviewed only one Establishment scientist. Her Acknowledgements and Selected Bibliography include only works by anti-Establishment scientists, and none of the numerous Reports by National Academy of Sciences Committees, United Nations Scientific Committees, International Commission on Radiological Protection, and National Committees on Radiation Protection in U.S., U.K., and other countries, all of which reject Stewart's controversial findings over the past 30 years. Nevertheless, the review in P&S states that the book is well referenced.

Your review states that in the 1970s, she came to U.S. and saw nuclear workers dying from radiation induced cancers, and that gradually her conclusions were confirmed by other scientists. Actually her methodology and conclusions were heavily criticized and rejected in dozens of published papers (as well as by the Reports mentioned above) including some by women (Ethel Gilbert, Sarah Darby, Valerie Beral, Shirley Fry) whom Greene relegates to the convenient category of honorary men so their work can be ignored. Her conclusions have been rejected by the vast majority of the involved scientific community. Her collaborator in this work, George Kneale, who is called her genius statistician, has not been able to justify his procedures to other statisticians, and they generally reject them. All of the criticisms and rejections of the Stewart-Kneale collaborations are characterized in the book as a conspiracy to hide the truth. The author makes no attempt, other than blaming it on sexist prejudice, to explain why so many prominent scientists have colluded to deceive the public in this way, and why almost all of the subsequent studies of nuclear workers have come out with results that do not agree with Stewart's.

The polemic nature of the book makes it a favorite for those with anti-nuclear political axes to grind, but I find it difficult to understand why P&S would publish this book review. It was reprinted by permission from a non-scientific British journal, without any provision for simultaneous publication of the counter-positions held by the mainstream scientific community.

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Teaching Innovations

I would like to thank Professor Lindenfeld for taking the time to share with us the positive experiences of innovative curriculum at Rutgers University. In turn, I would like to share some attempts I have made to initiate a physics program at a small liberal arts university, with incredibly limited resources. I hope this might help others with similar lack of facilities and perhaps initiate a dialogue on how we as a community might help each other in this regard.

I have every intention of being as brief as possible, but would like to start with a short comment on the aptness of Dr. Lindenfeld's choice of category, - 'missionaries for physics', -for that indeed is what many of us are! (Interestingly, I have been called the "Billy Graham of Physics" by a student in Middle Tennessee and was unsure how to react to the description!)

When I joined Cumberland University four years ago, physics was a service program for some other majors and the general education core. As the only faculty member in the subject, I quickly realized I had no hope of initiating a traditional physics program or of finding any students in the highly improbable situation of getting one going. As a persuasive 'missionary' of physics I increased enrollment in physics and astronomy courses by 150 % in the first year. Thereafter, I was able to initiate a non-conventional physics program, with emphasis in Information Systems or Industry, so that I could utilize mathematics, computer programming and business courses that were taught by other faculty and other programs. I embarked on this path with considerable trepidation, as might be expected. I was going to let loose in the world physics majors, without all of the traditional courses we ourselves survived! However, I was emboldened in my endeavors by encouragement from colleagues in research and teaching and by some of the informative studies and surveys available from AIP.

To cut the long story short, in a school of about 1000 students, (mostly recruited for athletics), we had 10 students enrolled as physics majors last year and three of them graduated in May 2001. The majority of the students have spent successful summers participating in undergraduate research at the National Labs and I expect them to be launched in successful careers, with positive feelings for physics and a generalized overview of what physics is about. I continue to have occasional twinges of doubt, but there probably is no clear demarcation of whether we should try to spread physics as much as at all possible or stop if we cannot provide the perfect program?

It is certainly encouraging to hear the steps taken at Rutgers and other universities to alleviate the problem of dearth of undergraduate physics students and I am sharing mine so that the chain might diversify and expand. I could not have implemented the program without the help of friends and colleagues around the country, particularly those at Oak Ridge National Laboratory, Brookhaven National Laboratory and University of Tennessee, - but I think help does have a way of appearing when the mission is physics!

I think the efforts of faculty trying to institute physics programs at small universities could be vastly aided, if we could come up with resource material or web-based courses that would allow students anywhere in the country to take individualized upper-level courses, depending on their physics and career interests. Occasionally one finds students at a small school who are potential graduate school material but faculty lack the resources to steer them to this path. I would be happy to interact with colleagues to help co-ordinate such accessible upper-level undergraduate curricula and make them available at the national level. I feel strongly that such efforts would help lighten the problem of shortfall of graduate students as well as increase the impact and visibility of physics.

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King Canute Rules Again

In a display of arrogance that is becoming all too typical of the Bush administration, communities lining the banks of the Mississippi are being encouraged to build levees to prevent flooding. It is amusing (if you live in Cleveland and not St. Louis) to perform the back-of-the-envelope calculation that predicts an interesting consequence of this policy.

Annual rainfall in the US averages about 1 m, and the surface area approximates that of a rectangle 5000 km wide and 2000 km tall. Of this 10^{13} m^3 of water, about 40% lands in the Mississippi watershed, from which we might guess that 10% reaches the river, the rest being lost to evaporation. The flow is thus $4 \times 10^{11} \text{ m}^3$ per year, or 10^4 m^3 per second. In a river 10 m deep and 300 m wide the water speed is then on average about 3 m/s, or 6 mph - a reasonable number.

The problem arises when we realize that rainfall is not constant, and that a wet month may bring 0.3 m of rain, with evaporation reduced from 90% to 50%. This increases the flow rate by a factor of about 16. What an impressive sight it would be to watch the river rush through Baton Rouge at 96 miles per hour! Professional baseball pitchers could test their fastballs by trying to hit floating objects!

Unfortunately the laws of physics intervene. There is not sufficient gravitational energy in the water to achieve this speed unless the water were made superfluid, a solution that even the Army Corps of Engineers might find difficult to implement. That there will be floods is thus physically unavoidable. Where they will occur will just be a question of who cannot afford to build a levee as high as their neighbor's. What a beautifully free-market solution to an environmental problem!

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Science and Belief

I read your review (in July, 01 P&S) of Wendy Kaminer's book, "Sleeping with Extra-Terrestrials ..." with some interest. I was particularly taken with your statement, "This hold seems irrational since that public has had more formal education in science than any other public, past or present." "That public" in the previous sentence relates to "American public" which is being compared to "any other public". Let me suggest for comparison that you use the Scandinavian or Canadian publics, with which I have some familiarity, and you would find that the prevalence of nonsensical pseudoscience is markedly lower in those countries than in America. I might be so bold as to suggest the reason is that the public education system in those countries is markedly better than in America.

Having been born and raised in America, I am always amazed at the huge disparity in educational excellence by regions which is not nearly so great in other countries. In the suburbs of the large cities the public schools are really quite good. In the inner cities and rural regions it can be dreadful.

Let me offer one further observation. Science is not a belief system. I find that most non-scientists think that it is and recall the time a chemistry colleague made the statement, in a student's oral defense exam, "... we all believe in quantum mechanics." I quickly corrected him but have often reflected on the fact that we don't stress, as often as would be useful, the difference between a belief system and one that is demonstrable. One can be a believer and be a scientist, so long as one keeps clear the separation between religion and natural philosophy. We, as a society, have not kept that distinction clear and I find that many believers think that science is out to destroy their beliefs. I like the vantage of the agnostic and know many good scientists who are people of faith. If we, as scientists, can admit there is much that is outside the world of science, and that which is, is a matter of belief, then many are comforted and are willing to try to recognize that which falls under the umbrella of science. If permitted (by the scientist) to believe in anything they like, their belief in pseudoscience soon wanes, and their belief in the bible may or may not follow but that is a different matter altogether.

Liked your review.

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Puechl's Further Comments on Science and Religion

I gather from Howard Richards' Letter in the last issue that he is opposed to my earlier suggestion for a broad in-depth discussion as to whether or not the teaching of religious dogma harms science/math education. I surmise that he is against this because he already "knows" that there is no such harm, only good, and that it is sacrilegious form to even suggest otherwise. I feel that this requires no comment from me, but I am deeply disturbed that he interprets my suggestion as being broadly anti-religious since, for some reason, he seems to believe, erroneously, that all religions are basically alike. I point out that it is the teaching of dogmatism whose harm I question, not the teaching of religion, per se.

For example, while I come from a Germanic-Lutheran background, I have great admiration for Judaism which has produced over 20 percent of all Nobel prizes ever awarded, and has produced an out-of-proportionate number of super-achievers in both the arts and the sciences and in almost all areas of human endeavor. I believe that this is so because Judaism concerns itself primarily with social cohesiveness and customs, not with dogmatic theology. As Alan Dershowitz says: "Jews do not need to believe in God, only in Judaism".

This is highlighted in the 1990 National Jewish Population Survey wherein "Jews by Religion" includes three subcategories: "Born Jews, Religion Judaism," 4.2 million; "Jews by Choice," persons who are currently Jewish but were born non-Jews, 185,000; "Jews Born with No Religion," persons who identify as Jewish but who answer "none," "agnostic," or "atheist" when queried about their religion, 1.1million. Together, these three categories total approximately 5.5million people. Consequently it is seen that approximately 20 percent(1.1 million out of 5.5 million Jews) characterize themselves as being non-religious. I now ask: "How many people who identify themselves as Christians would answer 'none,' 'agnostic,' or 'atheist' when queried about their religion?"

This interesting aspect of Judaism was recently made more personal in a Los Angeles Times obituary for Joseph Weber, a prominent UC Irvine physics professor. Therein his wife, Virginia Trimble, another well-known UC Irvine scientist, an astronomer and author, is quoted as follows:

"We typically never squabbled very much. If we disagreed, it was about scientific issues. He didn't believe the observational evidence for the cosmological constant, and I think it's highly probable. He was raised as an Orthodox Jew and we both attended Temple Beth Emet in Anaheim. He was actually an atheist, who wanted to maintain Jewish traditions. It was another thing we didn't have to disagree about. We both agreed that modern cosmology provided a better picture of the early universe than does the book of Genesis."

This leads me to the question" Would an atheist who evolved out of an evangelical Christian background, or a Roman Catholic background, be accepted by members of his or her former congregation and feel comfortable attending services routinely?"

And now for a couple of comments relative to the last paragraph of Howard Richards' letter. I say: "Hooray for the racial minorities and foreigners who are rapidly becoming the predominant number of graduate students in our university science departments. Why the dearth of American youngsters? Could it be because of their early exposure to, and then continued emphasis on, dogmatic belief?" And further: "A great hooray for the editors of Physics and Society for maintaining a balanced and open editorial policy that invites diverse opinions and interaction."

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