

Reference

1. For example, G. Burbidge, *Astron. Astrophys.* **309**, 9 (1996).

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Cosmology Addendum: A Turner for the Better and a Web Cite

I would like to correct an error and an omission in the bibliography of my article, "Reply to 'A Different Approach to Cosmology,'" which ran in your April issue (page 44). Reference 3 should have read "E. Turner" (not "M. Turner"). Also, I should have cited an interesting 1994 exchange between Edward Wright (*astro-ph/9410070*) and Fred Hoyle, Geoffrey Burbidge, and Jayant Narlikar (*astro-ph/9412045*), which is available on the Web from the Los Alamos preprint archive (<http://xxx.lanl.gov>).

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Dual-Career Couples Can Trouble Students

Your article "The Dual-Career Couple Problem" (July, page 32) deals with many aspects of the two-professional couple in academia. But the authors fail to address the problem from the student's point of view. Whenever a husband-and-wife team teaches in the same institution, a conflict of interest is inherently created. What if a student performs poorly or has a personality clash with the teacher in one course, and then has to take a course offered by that teacher's spouse? Such a situation can lead to a clear disadvantage for the student. Although the student actually may do well in that second course, the teacher's normal reaction to what had happened in the first course would almost certainly bring extraneous factors to bear on the student's grade. Of course, one cannot blame the teacher for reacting like that.

I know whereof I speak, because I once had to deal with a situation in which the wife was a terribly dull teacher for a terribly dull required

course, and the husband taught a more advanced course that was also required. Because I did not tolerate the dull course well and the wife was upset with me (although I earned A's), I was penalized in the advanced course by the husband for having upset his wife. He denigrated me in class and gave me one-grade reductions (to B's).

Because of the clearly unavoidable conflict of interest in such cases, married couples should not be allowed to teach in related departments, possibly not even at the same academic institution. The prohibition should probably extend to teachers who start dating each other, since the same conflict will immediately arise.

The institutions of higher learning are supposedly funded from the public trough because they exist primarily for the general benefit of students and for training our future scholars and intellectual leaders, not to provide an easier life for dual-career couples. If the interest of the students really is paramount, an institution should hire the one member of a couple that it wants. If it also wants to help find the other spouse a job, then it should do so, but at another institution or organization.

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MCNEIL AND SHER REPLY: Robert Dennis had a bad experience with a single couple, and received B's instead of the A's he thought he deserved. Complaints from students about "unfair" grades are common, but Dennis's solution to the "problem" is more drastic than most. Based on his view of a single incident, he wants to force thousands of scientists, primarily women, to give up their careers. We are reminded of those employers who refuse to consider female candidates because "We hired a woman once, and it didn't work out."

He even goes further and wants to dismiss faculty members who begin dating one another. Besides the obvious legal difficulties of an institution restricting the social life of its employees, the realities of small college towns limit the options of faculty members who are single. Since they certainly shouldn't date students, and Dennis doesn't want them to date faculty, what are they to do?

Nobody we know of has suggested that institutions of higher learning exist to provide "an easier life for dual-career couples." As we stated in the article, helping dual-career couples helps an institution by allowing it to

attract and keep two talented professors. It certainly is not in the students' best interests to have faculty members leave because a spouse found a job elsewhere. Dual-career couples are generally closely tied to the academic community, which is good for students. Such couples also show students that they don't have to choose between career and family.

One of us (Sher) also had a difficult experience in college, when a professor was never available because his child was sick. He missed office hours and wasn't available before exams; it was not a good learning experience. Everyone agrees that faculty members with children have less time available to help students. Does that mean faculty members should be prohibited from having children?

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Oppie's Reputation as Leader Is Questioned

In his letter in your June issue (page 13), Ben Oppenheimer says of J. Robert Oppenheimer that "it could be argued that his leadership on the Manhattan Project had been paramount in safeguarding this country's interests during World War II." But it also could be argued that Robert Oppenheimer had little to do with the scientific leadership that produced the A-bomb. The decisions to build the weapon and to use it were both presidential decisions. Scientists played advisory and enabling roles that were critical to the successful design and production of the weapon, but it is arguable as to which scientists were critical to that achievement.

One clearly essential breakthrough was Enrico Fermi's demonstration of a fission chain reaction in Chicago in December 1942. The steps from there to the bomb were, at least in hindsight, matters of scaling and design, to be mastered by competent engineering. Yet Oppenheimer was not even remotely an engineer. In fact, Fermi and Oppenheimer present such a contrast in scientific and personal qualities as to make them models for students of the sociology of science generally.

Fermi was the brain, heart, and soul of any scientific team of which he was a member. He was equally proficient in theory and experiment. That, combined with a natural charm, modesty, and willingness to

bear the burdens of tedious laboratory chores, earned him the reverence of his associates and made him a true leader. The achievements with which he is credited are unmistakably and beyond all argument his very own.

The easiest way to characterize Oppenheimer, on the other hand, is to say he was Fermi's opposite in almost all significant respects. Fermi was a natural leader; Oppenheimer was a leader by administrative fiat. As a result, it is very hard to say exactly what credit belongs to Oppenheimer for creating the A-bomb other than that he served as the director of the lab that produced it. That statement is strictly correct, but it leaves a vacuum to be filled as far as engineering or scientific accomplishment is concerned.

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Rejection Slips Stem from Poor Refereeing

José Marín Antuña complains that "third world" research papers submitted to "first world" journals tend to be rejected out of hand with no meaningful technical criticism (PHYSICS TODAY, March, page 14). It will be small comfort to him to know that he is not alone in this; I have had similar responses to two recent submissions to a certain American journal. Whether this undermines his conviction that such scandalous behavior is triggered by some sort of antagonism toward developing countries will depend on his view of the UK as a first or third world country (delicacy forbids me to venture a suggestion). Frankly, I believe it is simply a case of unacceptable refereeing that editors ought to weed out for the continuing good of science. For what it's worth, I have never experienced anything but reasonable refereeing in British and other European journals, and I would be shocked if Marín Antuña has found otherwise.

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Industry Can Play Key Roles re Professional MS Degree Programs

In your June story (page 54) on professional master's degree programs, one of the problematic issues raised is that of tuition. As pointed out, payment of tuition by students is the norm in law and business schools, but is something new and disturbing for science students. To address this

concern, we suggest that incorporating industrial internships into such programs can be very beneficial, as they can provide students with immediate feedback on the usefulness of their training, as well as real money and immediate job prospects.

Last year the University of Oregon's Materials Science Institute launched an industrial internship program with two tracks, the first in semiconductor processing and the second in polymer science. In this program, students receive classroom and laboratory instruction followed by six-to-nine-month paid industrial internships, during which they apply what they have learned and can earn up to 30 credits toward a master's degree in physics or chemistry.

Response from industry and students alike has been very positive. All the students who completed the internship program last year have received permanent job offers from their host companies. This past summer, we added a doctoral version of the program to the offerings of the chemistry department. Beginning next fall, the physics department will offer a master's degree in applied physics that will include the industrial internship program as an elective track.

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Reporter Jean Kumagai quotes Hans Bozler as saying that "it just doesn't occur to [newly hired PhDs] that they were hired to make money for the company." Perhaps it should also occur to the hiring companies that they are hiring these scientists to *perform research* that will make money for the company. Deification of the bottom line will do little to advance the long-term welfare of either a company or the world.

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More on Correlated-Photon Metrology

In his letter (May, page 95), Duane Jaacks points out that the idea of a "free lunch" in determining the absolute efficiencies of detectors goes back considerably further, to the 1950s, than Alan Migdal indicated in his article "Correlated-Photon Metrology without Absolute Standards" (January, page 41). In fact, the story is actually much older than that, going back even be-

yond the 1930s work mentioned by Migdal in his reply to Jaacks, and what is more, the applications of this feature of the coincidence technique are wider.¹ The possibility of determining absolute detection efficiencies is a general property of instruments in which arrival of a particle (photon) may result in two independent detectable phenomena. The technique was used for the first time in the 1920s by Johannes Geiger and coworkers, who determined the imperfect efficiencies of human observers counting scintillations.

Reference

1. M. Gruntman, Rev. Sci. Instrum. **68**, 3617 (1997); see p. 3633.

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On Experiment and Theory, Eddington Really Is the Limit

On reading the letter in your March 1999 issue (page 113) in which Ermanno Pinotti contests the statement in Frank Wilczek's essay in your April 1998 issue (page 11) concerning verification of experimental facts by numerical simulations, I was reminded of Arthur Eddington's observation: "It is also a good rule not to put too much confidence in experimental results until they have been confirmed by theory."¹ On the other hand, Eddington also wrote: "When an investigator has developed a formula which gives a complete representation of the phenomena within a certain range, he may be prone to satisfaction. Would it not be wiser if he would say 'Foiled again! I can find out no more about Nature along this line.'"²

References

1. Cited in R. L. Weber, *More Random Walks in Science*, Institute of Physics, Bristol, England (1982), p. 111.
2. Cited in Astrophys. J. **101**, 133 (1945), as referenced in Weber, p. 109.

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Editor's Note

Elena Bonner holds the copyright to the Andrei Sakharov speech, published in English as "Lecture in Lyons: Science and Freedom" in the July issue of PHYSICS TODAY, page 22. All reprint requests should be directed both to her and to our publisher, the American Institute of Physics. ■