journals of the developed countries.

Statistical studies, including some published in the US (such as Wayt Gibbs's "Lost Science in the Third World"[1]), show that journals in developed countries appear to be reluctant to publish papers by researchers in developing countries. Unfortunately, the rejection of manuscripts is too frequently based on the opinions of editors or referees who fail to provide any meaningful technical criticism or commentary. Instead, they express subjective opinions, such as "The topic is not of interest to the scientific community," "We have too many papers to publish in our journal, so we recommend you send yours to another journal," "The topic of your paper does not coincide with the interests of our journal" and "This topic has not generated publications in the past few years, so we do not recommend the publication of this paper." I have personally encountered such forms of rejection, as have colleagues of mine, and regrettably they are not uncommon.

I do not want to start any kind of intellectual war concerning this issue. Rather, I just want to appeal to the conscience of our peers in the developed countries, who have the power to influence publishing decisions when reviewing manuscripts, and to ask them to evaluate submissions strictly on technical merit and to arrive at recommendations based on factors other than weak subjective justifications.

A more reasoned and impartial review process will help us in the "third world" to make our modest contributions to science, and to feel that we are part of a truly global scientific community and on an equal footing with our colleagues elsewhere.

Reference

1. W. W. Gibbs, Sci. Am., August 1995, p. 76.

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More on Topic of Faculty Retirement and Full Faculties

In his "Nibbling the Bullet" (PHYSICS TODAY, June 1998, page 11), Daniel Kleppner argued that faculty members over the age of 70 should retire in order to create openings for younger scientists and to help balance department budgets, increase department morale and develop new physics. Subsequent letters to the editor (October 1998, page 11) have commented mainly on the role of the individual in this matter.

What is still needed, though, is a complementary approach at the group level that takes a holistic perspective, explores options and is likely to facilitate individual decisions. Here, I offer such an approach, which calls for making changes at the department and university levels.

First, to maintain its high standards of teaching, research and service, a physics department must be given flexibility in its employment and budgetary practices, including the right to extend the working lives of faculty members on the basis of their abilities and productivity. Accordingly, there should be no mention of age.

Second, the university should step in to help if the physics department is having trouble setting its maximum number of tenured professors, as can happen when department income is determined almost solely by student enrollments. In such cases, I propose, a stable minimum size should be set and guaranteed by the university on the basis of its endowments.

Third, physics departments and their universities should increase their willingness to accept nongovernment and industrial funding of professorial appointments, together with the implied obligations associated with corporate research and training. A loss of some academic freedom for such positions would be an acceptable price to pay for the advantages accruing from increased expertise and flexibility. Furthermore, increased entrepreneurial activity is likely to help improve the department's morale and vitality.

Acceptance of such an approach by both the department and the university, coupled with goodwill all around, would enable the department to create a more stable and flexible working environment for all of its faculty members.

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Some of the letters to the editor commenting on Daniel Kleppner's essay question whether there is a problem, and others suppose it must be deadwood clogging the system. I would argue that if there is a problem, it is quite the opposite: active researchers not retiring when they could.

Although mandatory retirement may be gone, university policies predicated on it are often still in place. Those policies reflected what was best for the one in the driver's seat—

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LETTERS *(continued from page 15)*

namely, the university—and more or less went, "Clean out your office and turn in the key, and then you'll get your last check." Now, with the decision in the hands of the retiree, hard-nosed policies become an impediment. Two of the obvious concerns of potential retirees, beyond having rough parity in paychecks, are "What about my medical insurance?" (once severed from group coverage, can one get or even afford individual coverage?), and "What about professional continuity?" (can one still have an office, access to computers, graduate students, and so forth?).

Thanks to retirement programs (TIAA-CREF, for example), a time graph of actual pay versus retirement benefits of many faculty should cross at some time around the standard retirement age. That is what a retirement program should make happen in the first place (an idealization, I realize). After that, both the university and the professor are arguably losing money. But with the correct incentives (such as budgets for travel and publication charges), the university could easily have the best of both worlds: continuing participation of an active established researcher (who has "retired") and young new replacements on deck at the same time. I'm not an accountant, but my guess is that an attractive set of incentives would not cost more (over the likely average duration of any such arrangements—say, 4–7 years) than the incremental cost of a potential retiree hesitating even a single year.

The day may even come when universities recruit emeritus professors.

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Numerical Simulation Nixed as 'Juggling,' Reply Is Planely Verse

Even though I'm not a particle physicist, I was fascinated by Frank Wilczek's April 1998 "Reference Frame" essay entitled "Back to Basics at Ultrahigh Temperatures" (page 11). However, I cannot agree with his statement that "chiral symmetry breaking is firmly rooted in experimental facts, and has now been verified directly by numerical simulations." What I contest is not the physics, but the claim made for numerical simulations.

I believe that numerical simulations cannot verify or demonstrate anything in physics. If physics is about the laws of nature, our questions must be addressed to, and answered by, nature itself through direct experimentation, not computer simulations. Of course, computer simulations can be invaluable in furthering our research, understanding the results and suggesting new directions (not to mention their technological applications).

I'm aware that, in many fields, numerical methods are the only way to explore realms forbidden to experiments. In these cases, though, I wouldn't state that computer simulations "verify" a theory, but would prefer to mention them as important and necessary "hints"—and not as substitutes for real experiments.

I have noticed that sometimes a speaker at a conference will give a beautiful talk and show plots that nicely fit some theoretical curve, and only at the end (if ever) will he or she mention incidentally that they are all computer simulations, not measurements. Typically, the next year, the same person will reappear with a completely different set of simulations, on the same subject but now fitting (still nicely) yet another model. I find this to be numerical juggling, not physics.

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FRANK WILCZEK REPLIES:

Won't you admit it's a trifle hysterical
To disbelieve *every* result that's
numerical?

How, then, could you use modern
aviation?
For the planes are designed by
simulation.
And are experiments at accelerators
all unsound,
Because they *simulate* the QCD
background?

O why do you recoil in terror
From calculations that control their
error?
Give it up! The symmetry's surely
broken,
The order parameter (its token)
Refuses, by 20 σ, to go away.
What's that, *a coincidence*? No way!

No offense, but it's silly to avert your
eyes
After 10^{18} floating point multiplies.

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