try to take the news philosophically. At the very least, I will confine my kicking and screaming to the privacy of my study."

I would welcome any correspondence on whether this explanation of why Mercury has no moons has been anticipated. It is rare that such a significant theoretical discovery in physics and astronomy has resulted from a leisurely exercise in a chair. It is possibly even more rare to have the discovery mentioned only in a small portion of a book of assorted essays.

BRUCE E. BUSHMAN
Laguna Beach, California

Peer vs. rival review

The discussion of usefulness of outside advisers in the National Science Foundation (September, pages 77 and 96) may be helped by using a more exact nomenclature. What is euphemistically called "peer review" often in reality is "competitor review" or "rival review."

As a rule, funds available to a section of the NSF are insufficient to satisfy all requests. Also, many reviewers are at the same time applicants. Simple arithmetic teaches them that, if many proposals submitted by competitors are rejected, the reviewer's proposal has more chances to be approved.

Even if the reviewer is not an applicant this year, he is very likely to be working on the problems treated by the applicant, and to have a difference of opinion with the latter. Thus he may sincerely believe that financial support of the applicant will result in proliferation of unconvincing results and promotion of a rival and incorrect explanation.

JACOB J. BIKERMAN
Case Western Reserve University
Cleveland, Ohio

More on plutonium recycling

I would like to comment on two of the points made in the news story in the August issue (pages 61–64) on plutonium recycling. The first is the attribution to William Higinbotham, "that the waste-disposal problem from light-water reactors is potentially a serious one." Higinbotham's quoted remarks actually do not lead to that conclusion except perhaps in the economic sense. In view of the large publicity given to the rather small technical problem of waste disposal, I think this should have been pointed out.

The other remark concerns the development of plutonium recycle industry as an economic matter. The comment of Frank Von Hippel is not currently correct, although it was until about 18 months ago. Price increases in the uranium fuel cycle due to escalations in the cost of both uranium ore and enrichment services have made plutonium a significantly more valuable material to use now in thermal reactors. In fact it is now appropriate to consider redesign of light-water-reactor fuel loadings for higher plutonium production than has been the case in the past. Such redesign would lead to considerably more significant decreases than Von Hippel indicated as the effect of plutonium recycle, both in the amount of uranium ore and in enrichment services required to support a significant nuclear power industry.

Finally, I would like to add my comment that any delay in utilization of plutonium simply adds to the amount of material of concern for diversion. I believe the case is strong for early burning of plutonium as a valuable material in power production rather than as a worrisome material for potential weapons use.

B. I. SPINRAD
Oregon State University
Corvallis, Oregon

COMMENT BY VON HIPPEL: As far as the economics of plutonium recycle in current light-water reactors are concerned, I will merely quote the March 1975 report of the ERDA Task Force on the Nuclear Fuel Cycle (ERDA-33, page 25): "Initial estimates for the cost of reprocessing were about $30/kg of fuel. As a result of the great increases in the capital cost of reprocessing plants, this cost is now estimated to be in the range of $100 to $200 per kg. At these prices including about $25/kg for waste disposal, plutonium recycle in light-water reactors may not be economic. Many utilities, reactor manufacturers, and consulting firms are now considering whether they should plan for plutonium and/or uranium recycle." As for the uranium conservation benefits of plutonium recycle: According to the numbers quoted in the *Report of the Liquid Metal Fast Breeder Reactor Program Review Group* (ERDA-1, January 1975, Attachment 5, page 17), plutonium recycle in current LWR's would stretch the uranium supply by less than 20. Uranium recycle would stretch it by a like amount.

These are merely quibbles, however. The important point is that, if our society ultimately decides that fission should supply a substantial portion of the US energy supply over the long term, then we will have to develop reactors that are less wasteful of our limited resource of high-grade uranium ores. One possible development route would be to improve the design of our current reactors (as Spinrad suggests), another would be to introduce reactors with naturally higher ratios for the conversion of

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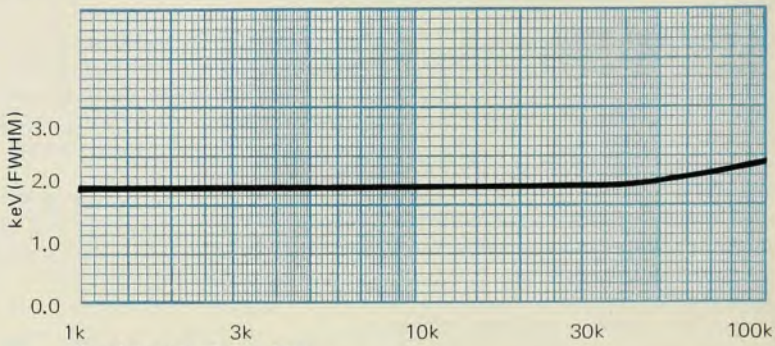

Resolution vs. Count Rate
10%, 2.0keV Ge(Li), 1.33MeV, 2001 Preamp, 2010 Amp, 8100 MCA

Model 2010
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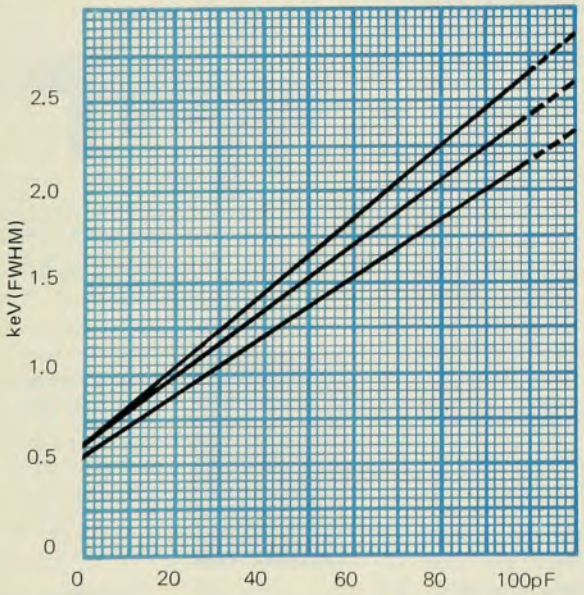

Noise (FWHM) in keV vs. Detector Capacitance

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"fertile" to "fissile" nucleides or even breeder reactors. Most of these routes would ultimately involve recycle of plutonium or uranium-233. When we have to make the decision on whether or not to go to such a recycle economy depends on, among other factors: the future growth of our electrical energy use, the share of the electrical supply provided by fission, and the extent of our uranium resource. Currently projections of all of these numbers are quite uncertain—just like the current economics of plutonium recycle.

Spinrad's final comment is incorrect. As long as plutonium remains in spent reactor fuel, the intense radioactivity of this fuel will make it relatively immune to diversion. Furthermore, if we ultimately decide to recycle plutonium, it will have considerably more fuel value if it is saved for the initial loadings of breeder reactors.

FRANK VON HIPPEL
Princeton University
Princeton, New Jersey

Obituary problem

This is to acknowledge the receipt of a letter from PHYSICS TODAY rejecting the obituary for a colleague which I had submitted. [PHYSICS TODAY had already printed a short staff-written obituary.] I concede the reasonableness of your rules against two obituaries for the same person. However, if such a rule is to be enforced as rigorously as you apparently do, I would suggest that you submit obituaries to the close associates of these subjects at the time of death, and not print an obituary based mainly on outdated information.

HENRY W. NEWSON
Duke University
Durham, N.C.

EDITOR'S COMMENT: To prevent the problem of double obituaries, we strongly urge that those who wish to write obituaries for their colleagues contact PHYSICS TODAY within a few days after the death. This would enable the writer to receive guidelines on length and style, and avoid our writing an unnecessary obituary or soliciting a signed obituary from another associate.

Metrication and Motherhood

It has frequently been assumed that scientists unequivocally support a legislated metric conversion. However, 22 faculty members in our department representing 40% of those contacted signed the following petition:

"Many now believe that eventual acceptance of the International System of Units (the proposed standardized metric system) is "inevitable." *If* this is true, then we believe that the "inevitable" conversion should take place naturally *without* the prodding of the ten-year program now being considered by the Congress.

"As scientists, we are well aware that the International System of Units is but a step in the evolving relationship of man to nature. Its origins are in the metric system, originally formulated during the French Revolution. The framers of that system could not foresee the impact which subsequent developments would have on technology. Units for developing sciences like electricity or optics were first introduced *ad hoc*. By the early part of this century, the metric system itself had been enlarged to encompass these 19th century developments. With little further modification, this enlarged system has become the International System of Units.

"Although recognized by statute the world over, the International System has not been fully accepted—even by European scientists and engineers. Deprecated units for such common concepts as force, pressure, and magnetic field persist because they are more convenient than their counterparts in the International System. More importantly, as a crystallization of basically 19th century technology, this system is poorly suited to 20th century developments. These developments have been in our understanding of fundamental atomic and molecular processes and in the use of binary—rather than decimal—arithmetic in computers.

"Within a generation, man may well devise a truly modern system—one which combines the coherence of the International System with the convenience of our customary one. We are concerned lest a legislated conversion to a rigid system deprive future generations of the benefits of a truly optimal system of measurement.

"Therefore, be it resolved that we, the undersigned members of the faculty of the Department of Physics and Astrophysics at the University of Colorado, urge the rejection of pending metric conversion legislation."

While circulating the petition among our colleagues, we discussed the broader problems of metrication. Some felt that a generation was far too long for an optimal measurement system to crystallize. The elements for such a system exist now. PHYSICS TODAY could help by publishing some of the many letters it has received that urge alternatives to the metric system.

Even if an optimal measurement system is an idealistic goal, many faculty felt that the metric system itself is not sufficiently meritorious to warrant Congressional interference in the conver-

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