know enough about current events in their field to relate their classroom agenda to student interests. Mathematics should be no exception.

The need to move students from lower, rote skills to complex problem-solving has been recognized in virtually every report on education during the last decade. It is calculation rather than deduction (as Rickert states) that improperly dominates today's school curriculum. Higher order problem-solving involves a variety of approaches and skills—not just calculation or deduction. Estimation of reasonable answers, identification of relevent issues, hypothetical "what if" approaches, structured approaches to isolate problem components, wise choice of tools and resources—all these and more must supplement the traditional diet of calculation and rote skills.

LYNN ARTHUR STEEN
Department of Mathematics,
St. Olaf College, Northfield, MN 55057

Peer Review at the Agricultural Research Service

As administrator of the Agricultural Research Service (ARS), I was surprised and mildly disconcerted to see Colin Norman's briefing (News & Comment, 7 Aug., p. 597) on the recent report (*1*) by a committee of the National Research Council's Board on Agriculture. The report evaluates the ARS project peer-review system. Had Norman contacted me first, I would have told him that ARS requested and paid for this study, that we welcome the Board's objective evaluation of our research processes, and that we are finding the report highly constructive and helpful to agency management.

The report states correctly that ARS uses peer review to improve the quality of our research. Unlike the National Institutes of Health and the National Science Foundation, ARS is not a granting agency. Our funds are appropriated by Congress for specific research programs. We therefore use peer reviewers, including outside scientists, to answer two questions about each proposed research project: Will it help solve the problem? Is it good research from a scientific standpoint?

Also, there seems to be some confusion about the relation between project peer review and position classification review. These are two different review systems, the former deals with the scientific aims of specific projects, and the latter deals with a scientist's work performance. They are related to the extent that the scientist's achievements on a research project can result in awards, increased peer recognition, merit pay increases, and upgrading of their position by means of the Office of Personnel Management classification system.

In summary, we in ARS did not find the committee's report "by implication highly critical of current practices," as Norman states. The committee report was straightforward, positive, and constructive. It implied nothing to the contrary. We have already taken steps to implement the justified recommendations made in the report. The agency's official response to the report is a 30 July letter from me to Charles M. Benbrook, executive director of the National Research Council's Board on Agriculture. I will be glad to share that letter with anyone.

T. B. KINNEY, JR.
Agricultural Research Service,
U.S. Department of Agriculture,
Washington, DC 20250

REFERENCES

1. Board on Agriculture, National Research Council, *Improving Research Through Peer Review* (National Academy Press, Washington, DC, 1987).

Response: The first paragraph in the section of the report headed "principal conclusions" states: "The committee finds a lack of understanding and agreement among ARS staff regarding the purpose, use, and effect of the project peer-review system. Many staff members also believe the system has no real impact on ARS research. As a result, some view it more as busy work than a substantive review of real or potential value to ARS scientists and, ultimately, to the ARS. This view seems logical because it appears the results of project peer review have no direct bearing on decisions affecting project funding, staff promotion, and merit pay increases."

I am surprised that Kinney does not find the report highly critical of current practices.

—COLIN NORMAN

International Science Foundation

Marjorie Sun's article "Strains in U.S.–Japan exchanges (News & Comment, 31 July, p. 476) addresses the fact that Japan is riding free on the knowledge developed out of basic research done in the United States and discusses the search for means to compensate for this. However, the arguments presented from various experts do not address the most crucial issue, inherent to basic research in both countries.

The goal of basic research is to produce new knowledge, with creativity serving as the base. Japanese society, which emphasizes conformity, harmony, and consensus and suppresses individualism and uniqueness is inherently unsuitable for carrying out creative research; it does, however, match perfectly with the development of commercial products. The opposite holds for American society, where individualism is emphasized. Americans are thus more suitable for performing creative research, but less so for developing commercial products, where coordinated teamwork is required.

Because of the sharp contrast in the social backgrounds between the United States and Japan, even if Japan increases basic research funding by a significant factor, the trend of Japanese industries having a free ride on the output of American basic research will continue. The output of basic research is new knowledge that cannot be sold or patented, but is crucially needed by humankind. It is wealth that human beings should share, without the restrictions of national borders. Clearly the most efficient way of supporting basic research is to fund the most productive laboratories or individuals in the world.

In view of these realities, I propose that we set up an International Science Foundation (ISF) to which interested nations would contribute funding, perhaps in proportion to their gross national products. The ISF would fund basic research in member nations on the basis of proposals and peer review by scientists in the member nations.

The system would work on the basis of merit and the fairness of the scientists who review the proposals. The foundation could be started by the United States and Japan. In this case, funding would flow from Japan to the United States for the conceivable future, because basic research activity in the United States is much stronger. The trend would continue until Japan revolutionizes her educational and merit systems. However, it would resolve the current strain between the two nations in a most effective way.

AKIRA HASEGAWA
AT&T Bell Laboratories,
600 Mountain Avenue,
Murray Hill, NJ 07974-2070

Erratum: In the map accompanying the article "War on cattle disease divides the troops" by John Walsh (News & Comment, 11 Sept., p. 1289), the name Upper Volta was incorrectly given for the country now called Burkina Faso. The country is correctly identified in the text.

Erratum: The Louisville Twin Study, referred to on page 600 (column 2) of "The genetics of personality" by Constance Holden (Research News, 7 Aug., p. 598), was started in 1957 by Frank Falkner, a pediatrician at the University of Louisville, not by Ronald Wilson, as stated in the article.