An Old Proposal For A New Profession: Scientific Reviewing

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Recently, T.V. Rajan of the University of Connecticut Health Center in Farmington presented thoughtful comments on the possible causes of the science research funding crisis (*The Scientist*, April 29, 1996, page 10). As the percentage of government-funded research proposals continues to drop while the pressure to publish original research remains high, he asked a simple question: "Isn't it time for us to raise a generation of scholars instead of experimenters, people who are willing to read, assimilate, and really understand all the information?"

I empathized with these remarks. For decades I and others have addressed the need-and value-of scientific reviews (*Current Contents*, 46:5-6, Nov. 13, 1974). Indeed, I have also urged the development of scientific reviewing as an alternative career (*Current Contents*, 14:5-8, April 4, 1977).

Reviews play an essential role in scientific communication and understanding. Well-written, critical reviews provide a necessary overview and integration of disparate fragments of rapidly advancing knowledge in a specialty or subspecialty. As such, they can elucidate trends in research and point to unanswered questions that provide opportunities for future study. Reviews also give science policymakers as well as researchers a clearer insight into the potential importance of emerging knowledge.

So why don't more scientists take up Rajan's challenge? One reason is that writing reviews is a uniquely demanding and intensive task. There was a time when tracking down relevant references to a subject in libraries was a major undertaking. That alone discouraged many scientists from writing reviews. While the situation today isn't perfect, it has improved significantly. The wealth of information sources available on the Internet, online databases, and document-delivery services makes locating and retrieving basic information on most topics both feasible and affordable.

Another reason scientists avoid writing reviews is the lack of professional recognition. Promotion and tenure committees still tend to place the highest value on original research articles, and reviews are not given equal weight. Funding agencies probably share this bias against reviews in their decision making. Even scientists may be guilty of exalting original research articles over other types of publications, although reviews are more frequently cited. I wonder how many scientists, if asked to list their most significant publications-as many tenure and granting agencies often request-include reviews among their top five or 10 contributions.

Perhaps the most important barrier is at the policy level. Do the people at the

National Institutes of Health, the National Science Foundation, and other funding agencies truly recognize the importance of awarding grants to support and encourage writing scientific reviews? These grants involve significantly lower costs than the typical laboratory-based grants or clinical studies.

There also is a cultural problem with getting more scientists to write reviews. That is, researchers don't become involved in this activity until after they are widely recognized as experts, typically later in their careers.

The campaign to encourage review writing should begin much earlier. A good model to emulate is the law review journal. Such publications are almost entirely student creations. Writing for a law review journal is considered a coveted honor, and it helps prepare students for their future careers. In science as in law, we ought to make review writing by qualified doctoral or master's candidates a prestigious and rewarding part of graduate education.

Unfortunately, few undergraduate or graduate science programs prepare students for writing or reviewing. No doubt, senior scientists who have written reviews do mentor small groups of students and may informally give them tips on how to improve their skills. But this effort will need a more formal and stronger push as the information superhighway makes it easier to access a vastly larger corpus of information and literature. The need to digest and redigest all of this material will be even more important to offset the effects of information overload.

It is important in the reward system of science that the next generation of researchers receive greater recognition for writing review articles. This worthwhile effort in service to the scientific community should not be treated or regarded as a distraction from their career advancement. Tenure and promotion committees might well consider the importance of this activity and how it relates to teaching. Funding agencies should also value scientific reviewing not just as a benefit to researchers, but also as outreach to science policymakers and the public to keep them better informed of scientific advances.

The National Academy of Sciences (NAS) recognizes the importance of reviews with the annual NAS Award for Excellence in Scientific Reviewing, in honor of biochemist James Murray Luck, the founder of Annual Reviews Inc. Perhaps it is time to establish an award specifically for young reviewers. Writing scientific reviews may well develop into an attractive part-time or even full-time career alternative for young postdocs, especially considering their current underemployment or unemployment. At the same time, reviewing is an activity well suited to "retired" scientists who want to keep up their involvement in research outside of the lab.

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