Editorial & Letters

EDITORIAL

A Celebration of Life in the Trenches

Your research director, or herr professor, or laboratory head is being congratulated for his stunning talk at a conference in Maui or Tuscany or Aspen. He talked about your work, using the slides you rushed to provide on 10 hours notice. Meanwhile, you're back in your windowless basement laboratory at 2 a.m. with a cold drizzle outside, waiting for your gel to finish running before you call it a day.

While this scene is a bit exaggerated, it highlights the fact that much of the process of science is driven by graduate students. Their long hours, careful observations, and insightful hypotheses contribute to both the everyday advances and the spectacular discoveries of many scientific disciplines, yet their efforts often receive only passing acknowledgment. The contribution made by some of these students is now being recognized by the Amersham Pharmacia Biotech and *Science* Prize for Young Scientists.

The prize recognizes ground-breaking research by a graduate student who was awarded a Ph.D. during the previous calendar year. The field is molecular biology, broadly interpreted: past winners have represented molecular genetics, structural biology, developmental biology, biochemistry, neurobiology, and immunology. Their experimental systems have included bacteria, trypanosomes, worms, flies, mammals, ...and simply macromolecules.

Awards are given in four geographical areas: North America, Europe, Japan, and all other countries. The winners receive a cash prize along with a trip to Stockholm in December. There they receive their award and help celebrate with a few more senior scientists receiving an even better known prize from the King of Sweden. Given the quality of the Young Scientist prizewinners, they may be back.

In this way, Amersham Pharmacia Biotech and *Science* have helped to make life in the trenches a bit more rewarding for those studying molecular biology. Those of us on the selection committee analyze the cold, hard facts of the applications: the student's essay describing thesis work, the quality of the resulting publications, and a one-page letter from the thesis adviser. Only later, having chosen the winners, are we reminded that science, like most human activities, is performed by a cast of characters. Among the winners from previous years are a mother of two whose work as a nurse provided her with the motivation for her research career; a young man who performed his Ph.D. research 3000 miles from his university, at a site not coincidentally close to where his girlfriend lived; and a woman who moved her Ph.D. project to three countries as she turned up new questions whose solution demanded new approaches. If there is such a thing as a "typical graduate student," he or she is a mean around which there is a very large standard deviation.

Yet there is a common denominator. All of these young scientists see themselves as explorers of realms biological. Early astronomers mapped the heavens and early navigators charted the oceans; with equal anticipation, these young molecular biologists are exploring uncharted waters within the cell. They hope that their findings will lead to medical benefits, but that is not the main thing that keeps them in the lab such long hours. The process of contributing to scientific understanding is all the reward they expected or needed. It is this spirit that is honored by the Young Scientist Prize in Molecular Biology. One wonders why there aren't more such prizes for other fields of research.

Thomas R. Cech

The author is a deputy editor of Science *and chair of the selection committee for the Amersham Pharmacia Biotech and* Science *Prize for Young Scientists.*

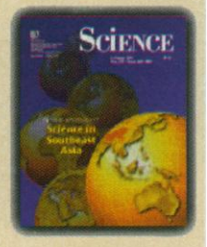
Previous Grand Prize winners include: Christine Jacobs, Ph.D., University of Liège, Belgium, for her paper "Life in the Balance: Cell Walls and Antibiotic Resistance" (1997); Scott D. Seiwert, Ph.D., Yale University, for his paper "RNA Editing Hints of a Remarkable Diversity in Gene Expression Pathways" (1996); and Michael O. Hengartner, Ph.D., Massachusetts Institute of Technology, for his paper "Life and Death Decisions: ced-9 and Programmed Cell Death in *Caenorhabditis elegans*" (1995).

For information about the Amersham Pharmacia Biotech and Science Prize for Young Scientists, contact *Science*, 1200 New York Avenue, NW, Washington, DC 20005, USA; fax: 202-289-7562; internet address: www.aaas.org/science/prize.htm

LETTERS

Around the world

Readers from several countries commented on the Special News Report of 6 March, "Science in Southeast Asia." Most of the letters expressed concern about how science programs will "help address the area's real problems" and bring "economic and environmental sustainability." A Malaysian student in the United States worries about how he can help his country. Other letters discuss Russian physics centers, computer "wizards," a reconstruction of Kennewick Man, calculus reform, and participants in a study of Lake Baikal in Russia.



ASEAN Science

The Special News Report "Science in Southeast Asia" (6 Mar., p. 1465) presents a valuable, comprehensive review of an important part of the world joining the international scientific community.

However, I should like to comment on sending promising students overseas for training (J. Mervis and D. Normile, 6 Mar., p. 1468). This is only useful if returning students receive the opportunity to use their overseas experience in their home country, which often cannot be realized. Better is a sandwich-model of training with alternating stays overseas and in the home country, concluding with a final examination in the home country. With Ph.D. degrees, this is no problem if publications in international journals are regarded as a decisive requirement for such a degree. An advantage of this system is that students can already introduce experience and techniques learned overseas in their home country during their training period and can also transfer these to their undergraduate students and even to guest students from their host country. Also, the teaching staff of their home university has to make itself familiar with the studies performed by such students elsewhere for the evaluation of their examinations.

We have a valuable experience with this system. Two students from Bandung (Indonesia) have worked in our department for four periods of 3 months per year (the maximum allowed stay with a tourist visa) subsi-

dized from scratch by 12 Indonesian, Dutch, and international sources, and they will receive their Ph.D. degrees in 1998 and 1999.

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In his editorial about science in the nations belonging to the Association of Southeast Asian Nations (ASEAN)(6 Mar., p. 1431), William Padolina states that science and technology are "necessary but insufficient" factors to achieve social and economic development in the region. Most of the articles in the following Special News Report about the region's various scientific programs explain little about how these new programs are going to help address the region's real problems of rural poverty, urban air and water pollution, deforestation, and high rates of population growth [the article about coconut oil processing in the Philippines (J. Mervis and D. Normile, 6 Mar., p. 1480) is a pleasant exception, as it describes the links between government policy, appropriate, affordable technology, and local producers]. The majority of people in the ASEAN nations are rural farmers and peasants. Space stations and aircraft construction mean little to the rural (and many urban) people of the ASEAN and will do little to address their problems. What most of the people in this region truly need are governments who are willing to tackle messy, real-world problems such as lack of drinking water and sanitation systems, and poor education and health care programs. The technologies to implement such programs currently exist, while barriers to their implementation are largely economic, cultural, and social. Many of the science and high-end technology programs described in the Special News Section will tend to serve small urban elites, while diverting attention and resources away from the region's key environmental and social problems. Glamorous and expensive top-down science programs are likely be more of a hindrance than an asset on the ASEAN's path toward economic and environmental sustainability.

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I am an undergraduate Malaysian student majoring in ecology and evolutionary biology at the University of Arizona. The Special News Report "Science in Southeast Asia" attracted me to read *Science* for the first time.

The report is especially correct about the lack of participation in research of talented young scientists. In Malaysia, people just do not see that there is a future in a research career. The "future" is measured by how much money you can make and what economic and social status you can achieve. A career that has a "future" is the one that gives you money, a car, a house, and a large sum of money in the bank.

Parents are the major financial providers of students, and they dictate, to some extant, what the students will be. Parents usually want their children to be engineers, doctors, or business wizards. I am lucky because my parents are allowing me to choose my own path. But I still have a hard time convincing my family that science is the way to go. I want to know, so I want to do research. I want to let others know about the things I love and enjoy, so I want to teach. My family is skeptical about my "future." They believe that I will not earn lots of money, even enough to support myself, by doing research, and they do not understand why I plan to pursue a graduate degree in either ecology or applied entomology. I will try hard to get a higher degree in the United States and go back to my homeland to teach and to do research. I know my future is meaningful because my country needs me, and I can actually do something for it. I see my future in science.

I have learned more about scientific development in Malaysia studying in the United States for almost 2 1/2 years than I did in Malaysia in 19 years. The media in Malaysia seldom report on the need for science and the opportunities offered by the government. Although I want to contribute to my country, I do not know where to start. I believe that many Malaysian scientists in foreign institutions and private companies are facing the same problem. They had the enthusiasm to devote themselves to the development of their country when they first graduated, but they did not find a way to do it. More information about research careers in science should be given to students so they know what to do and where to start. There needs to be more information available about the availability of information. The government agencies involved and the media need to work together to sell the idea of government encouraging more scientists to do research.

The recent economic crisis in Malaysia is causing students to return to Malaysia because of financial difficulties. I hope that the crisis will soon be over and my country can continue its pursuit of skill, knowledge, and progress.

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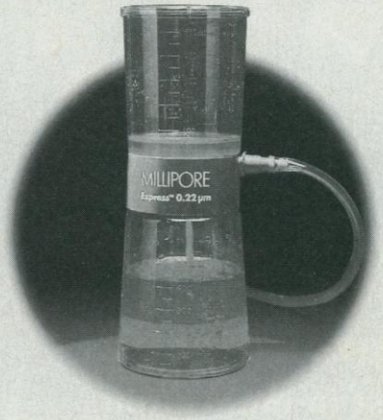

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