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LETTERS

Renovating Italian Science

We can only be sympathetic to Vittorio Sgaramella (Letters, 21 Jan., p. 305), who discusses Italy's role in Europe. We agree that Italy should be better represented within the European Molecular Biology Laboratory (EMBL). We do not agree with those who hope that, by withdrawing from EMBL, things might improve ("Italy throws EMBL into turmoil," News & Comment, 21 Jan., p. 315). Not only would such a decision discredit Italy's already weakened image, but it would make futile the financial investments of two decades in support of the EMBL. It would undermine ongoing efforts of Italian institutions that are directed at improving the quality and stature of scientific research in Italy.

For this embarassing situation there is only one responsible: Italy itself. It is unrealistic to expect that EMBL would solve Italy's problems, and the notion that a few more regional labs in Italy (supervised by EMBL) would improve the quality of our provincial research is misleading. To the contrary, it would create more dependency on the European partners.

For this new spur of provincialism, however, Italian scientists should be granted the benefits of the doubt, since more aggressive "euro-skeptical" partners are already guilty of expanding their own regional domains. Nonetheless, because we live in a fast-paced, competitive world, leading countries are reluctant to wait for less-aggressive ones, and concepts such as Europeanization and internationalization seem to be of secondary concern. The National Institutes of Health in the United States should be an illuminating example to European scientists. Through the concentration of a "critical mass" of scientists, this institution has been able to remain at the forefront of research, not through a rainy political dispersion of precious funds.

For its own good, the Italian scientific community should enforce vigorous standards of scientific research in place of short-sighted political convenience and claim its intellectual independency from a falling-apart, "partitocratic" system that has no long-term future. The real problem is that the vast majority of the Italian scientific establishment has learned through the years, for reasons of mere survival or opportunistic convenience, that tactical maneuvering and receiving timely blessings from friendly political leaders represent the only guaranteed tickets to life-time tenured positions and well-secured funding. Peer review of grant proposals and competitive research training programs are not the tradition in Italy. Bitterly, scientific excellence and meritocracy have been slashed by political interferences which, given the current political system, would engulf any new regional initiative.

Italian scientists can perform outstanding research in molecular biology or other disciplines. It is up to them to resolve their internal struggles. The ongoing Italian political revolution should be looked on by the Italian scientific community as a historical occurrence for renovating itself and creating opportunities for new generations.

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Quality of EPA Research

Richard Stone's article "Can Carol Browner reform EPA?" (News & Comment, 21 Jan., p. 312) discusses the poor state of Environmental Protection Agency (EPA) science efforts in research, leadership, and science-based decision-making. Several other key factors underlie this sad condition. Environmental protection policy disagreements are not about what to conclude from the available scientific knowledge; they represent a struggle for political power among groups having vastly differing interests and visions for society. In this struggle, science is used as a means of legitimizing the various positions. Typically the uncertainties of the available evidence are exploited to bolster particular positions, and the inconvenient bits are ignored. In this way science is a pawn, cynically abused as may suit the interests of a particular protagonist despite great ignorance concerning the problems being addressed.

This process degrades both science and the contending parties. However, until a social consensus emerges regarding how environmental protection goals will be balanced against those of economic development, the situation appears unlikely to improve. It might be better for a while to focus resources less on trying to improve

EPA-related science and more on spreading an understanding of how poor a decision-making foundation existing knowledge provides. An appreciation of the limits of low quality might induce greater caution in regulation of the environment and greater ambition to understand it.

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There has been ample rhetoric from EPA Administrator Carol Browner about injecting good science into her agency's regulatory policies and decisions. Now it's time for actions, and the FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) biotechnology regulations for microbial biocontrol agents and for plants with pesticidal properties would be a good place to begin.

Biotechnology regulation by EPA has been consistently insensitive both to the scientific evidence and to official government policies attempting to rationalize regulation. For a decade, EPA has issued proposal after proposal that has sought to bring recombinant DNA–manipulated microorganisms into the regulatory net, despite broad scientific consensus that the method of manipulation is independent of risk. The quality of the science that EPA has brought to policy formulation was severely criticized by the independent National Biotechnology Policy Board (*1*) and by EPA's own blue-ribbon advisory panel (*2*), but the agency yielded on biotechnology only in a small way, in a 1993 proposed regulation on microbial biocontrol agents (*3*). Moreover, as recently as January 1994, EPA got the paradigm wrong again: for a biotechnology regulation on plants with pesticidal properties, EPA presented to an advisory committee "an option . . . using a criterion based on the process used to modify the plant, e.g., recombinant DNA methodologies."

The FIFRA biotechnology regulations for microbes and plants represent important opportunities for scientific principles to guide public policy. It will be interesting to see whether Browner and EPA seize them.

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1. *1992 National Biotechnology Policy Board Report* (Office of the Director, National Institutes of Health, Bethesda, MD 1992).
2. Expert Panel on the Role of Science at EPA, *Safeguarding the Future: Credible Science, Credible Decisions* (Document 600/9-91/050, Environmental Protection Agency, Washington, DC, 1992).
3. *Fed. Reg.* **58** 5878 (1993).

Administrator Carol Browner is quoted in Stone's article as advocating basing EPA's decisions on "the best possible science," a political ritual common to virtually all past EPA administrators (not only William Reilly, but even Anne Gorsuch claimed this as one of her primary goals). Notwithstanding the many unanswered questions in the natural and engineering sciences to which such statements usually refer, many of the most important uncertainties for improving EPA's policies lie not in these fields, but in the socioeconomic disciplines.

Despite recommendations from the National Research Council (*2*), however, and repeatedly from EPA's own Science Advisory Board (*3*), socioeconomic research support at EPA remains miniscule compared with investments in natural science and technical research. According to a recent AAAS study, EPA's annual budget for social science research was zero as recently as 1990; it is still only half a million dollars per year, compared with more than $346 million for research in the natural and health sciences, engineering, and computer science (*4*). A socioeconomic research strategy paper was developed in 1991, circulated for comment and even reviewed by the Science Advisory Board, but more than 2 years later it still has not been published, let alone implemented (*5*).

If EPA is truly to base its decisions on the best possible science, it will need not only to improve the quantity and quality of its research but also to correct the profound imbalance in *what* research it supports and to address equally important socioeconomic factors that determine the effectiveness of its policies. A likely result will be the discovery of many risk-reduction opportunities that are less costly and more effective than present policies.

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References and Notes

1. R. N. L. Andrews, paper presented at the U.S. Environmental Protection Agency–Air and Waste Management Association Joint U.S.–Dutch Symposium on Comparative Risk and Air Pollution, Keystone, CO, 7 June 1993.
2. Board on Environmental Studies and Toxicology, *Opportunities in Applied Environmental Research and Development* (National Research Council, Washington, DC, 1991).
3. *Reducing Risk: Setting Priorities and Strategies for Environmental Protection* (SAB-EC-90-92, Science Advisory Board, U.S. Environmental Protection Agency, Washington, DC, 1990); *Strategies for Risk Reduction Research* (Science Advisory Board, U.S. Environmental Protection Agency, Washington, DC, 1988), appendix E; *Review of the ORD Draft Pollution Prevention Research Plan: Report to Congress* (Science Advisory Board, U.S. Environmental Protection Agency, Washington, DC, 1989).
4. *Federal Funding for Environmental R&D: A Special Report* (American Association for the Advancement of Science, Washington, DC, 1992), p. 64. EPA officials estimate than an additional $2 million in nonresearch funds may also be spent on economic aspects of global change and other scientific issues (p. 48), but even this total would amount to only 7/10 of 1% of EPA's research budget.
5. A draft of *Stimulating Environmental Progress: A Social Science Research Agenda* (Office of Policy, Planning, and Evaluation and Office of Research and Development, U.S. Environmental Protection Agency, Washington, DC, 30 December 1991).

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Memories of Uranium

The article "Radiation: Balancing the record" by Charles Mann (Special News Report, 28 Jan., p. 470) brought back memories of my experience with radioactive materials during World War II. In the mid-1940s, as a teenager, I was an assistant in the mineral dressing laboratory of the Australian Council for Scientific and Industrial Research in Adelaide. For almost a year I ground samples of uranium ores into fine powder in preparation for analysis and enrichment studies with no protective clothing, not even a dust mask. The research officer and I did all our paperwork at a desk in the laboratory surrounded by many pounds of uranium ores and concentrates that were sitting on the bench tops. This was considered normal. Safety was not even thought about. Making a contribution to the war effort was the great concern.

While we cannot condone illegal or unethical actions, we should judge these early activities by the standards of safety, ethics, and secrecy that were in force at that time and not by the more stringent standards that came into force several decades later.

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The Odds of Retirement

There is uncertainty about how university faculty will respond to the elimination this year of mandatory retirement. Evidence from longitudinal studies of faculty retirement behavior before age 70 suggests that (absent additional incentives to retire) a large number of faculty will tend to remain indefinitely. But that analysis rests upon extrapolation: We have no direct data on the tendency for faculty to retire voluntarily in the absence of mandatory retirement.

No recent data, that is. A startling