Contributions that scientific unions could make to the efforts of the Megascience Forum to foster international scientific cooperation are illustrated by the experiences of the International Union of Pure and Applied Physics. There is a major shortage in the United States of neutron diffraction instruments, which are currently the only means structural biologists have to probe certain aspects of protein structure. A reader recounts his findings from the 1949 memoir of chemist Arthur Eichengrün about the clinical development of aspirin, findings which he published in *Collier's* in 1953. And "[I]f the United States decides in favor of genetically modified crops, they should be free to do so....However, Europe should similarly be allowed to decide."

Megascience Forum: Valuable from IUPAP's Perspective

In his Policy Forum "International scientific cooperation" (*Science*'s Compass, 8 Oct., p. 245), Pierre Baruch asks the question, "Has the [Megascience] Forum been worthwhile, and did it justify the resources that were invested in it by the participating countries?" From the perspective of the International Union of Pure and Applied Physics (IUPAP), the answer is yes. When the Megascience Forum (MSF) was first set up, it was greeted with some suspicion by many in the science community as another bureaucratic body that would try to tell scientists what to do and how to do it, but it has not been that way at all. IUPAP has had three main interactions with the MSF. The first, described by Baruch, was in regard to our recommendations for access to large-scale scientific facilities. From IUPAP's perspective, the main thrust of our recommendations was accepted.

In the second interaction, IUPAP brought together a group consisting of the chairs of our commissions on condensed matter physics plus the chairs of the neutron source users groups from Europe, North America, and Japan to comment on the report of the Working Group on Neutron Sources while that report was still in draft. Most of our recommendations on the draft were accepted by the Working Group, and this input from the science community was beneficial and effective for both sides.

In our other major interaction, the MSF had been asked by the proponents of $100-million–class underwater neutrino observatories to help sort out certain national rivalries. The Forum found that the scientists were not talking to one another, so the Forum suggested that IUPAP set up a group to facilitate discussion and foster international collaboration on large-scale astroparticle physics collaborations. We did so, and the protagonists seemed to find it useful in fostering discussion and sorting out rivalries and priorities.

Interactions between the MSF and the scientific unions can help to address another problem identified by Baruch—that of the limited membership of the Organization for Economic Cooperation and Development (OECD). IUPAP's membership includes many non-OECD members, such as China and India, as well as South American, African, and Middle Eastern countries. Maintaining a communication channel between the Forum and IUPAP has allowed the views of these countries to be included to some degree.

The MSF, under its new name, the Global Science Forum, can be more effective in the future if the problems identified by Baruch are addressed. The governments that fund large-scale scientific work need an informal place to discuss issues, but those discussions have to be informed by appropriate scientific input. Strengthening the scientific membership of national delegations, as suggested by Baruch, is one way to do that, and another way that gives an even broader perspective is to strengthen the links between the Forum and the scientific unions in appropriate areas.

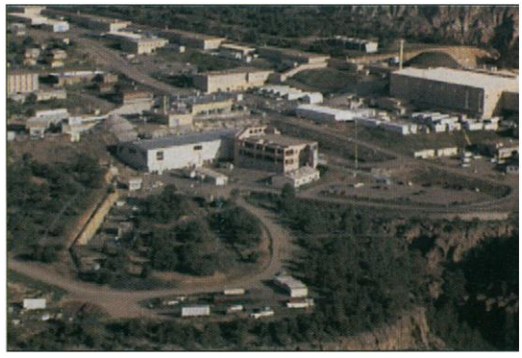
Burton Richter*
Stanford Linear Accelerator Center, Stanford, CA 94309, USA. E-mail: brichter@slac.stanford.edu
*President, International Union of Pure and Applied Physics

Need for Neutron Diffraction Instruments

The News Focus article by Robert F. Service "Wiggling and undulating out of an x-ray shortage" (27 Aug., p. 1342) highlights the shortage of hard x-ray sources that has occurred after an explosion in demand from structural biologists. A greater shortage for U.S. structural biologists, however, is that of neutron diffraction instruments. With the shutdown of the High Flux Beam Reactor at the Brookhaven National Laboratory, no neutron diffraction facilities for structural biology exist in the United States, whereas in Europe, at the Institut Laue-Langevin in Grenoble, France, adjacent to the European Synchrotron Radiation Facility 3, neutron protein crystallography stations are available.

Although hard x-rays are opening up exciting possibilities with crystals that diffract to atomic resolution, for most proteins, neutrons remain the only probe for locating important protons at catalytic sites and for studying hydrogen bonding and hydration structure.

We conducted a survey of the structural biology community in the United States to assess their future demand for neutrons (*1*). Seventy-seven percent of respondents indicated that they would use neutrons for protein crystallography, fiber diffraction, and membrane diffraction if facilities were available. A large discrepancy exists between the expressed needs of the structural biology community in the United States and the neutron diffraction facilities that are available. The survey response is being used to establish a Neutron Diffraction Structural Biology Users Group for the protein crystallography station being built by the Life Sciences Division at the Manuel Lujan Jr. Neutron Scattering Center at Los Alamos National Laboratory (LANL), which is being funded by the Department of Energy's Office of Biological and Environmental Research. If this is to be the only resource of its kind in the United States, the projected demand will outstrip supply by a factor of 4 to 5.



CREDIT: LOS ALAMOS NATIONAL LABORATORY

Neutron diffraction facilities will be built here at the Neutron Scattering Center at LANL.

Paul Langan
Benno P. Schoenborn
LANL, Los Alamos, NM 87545, USA

References and Notes

1. A survey report can be obtained on request from langan_paul@lanl.gov or schoenborn@lanl.gov and will be posted on our Web site at http://lsdiv.lanl.gov/nsb/