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EDITORIAL

Science in the National Interest

The forum organized by the Office of Science and Technology Policy (OSTP) held at the National Academy of Sciences on 31 January and 1 February was an impressive event. Speakers included Senators Tom Harkin (D–IA), Barbara A. Mikulski (D–MD) and John D. (Jay) Rockefeller IV (D–WV) and Representative George E. Brown Jr. (D–CA). More than 200 other distinguished participants were present, having come from around the country. Their attendance and their attitudes indicated great concern about future federal funding for research.

The content of the talks delivered by the powerful members of Congress was not altogether reassuring. In an effort to curtail the chronic overall budget deficit, Congress enacted a 5-year package that is scheduled to be annually more restrictive. In addition, a large number of members of the House of Representatives are budget hawks seeking even further tightening. It was they who killed the Superconducting Super Collider. If the budget hawks attack further, they are most likely to affect the physical sciences, mathematics, and engineering. Health-related research is relatively invulnerable. Everyone in Washington, including members of the media, is in favor of better health. In his concluding remarks at the end of the OSTP symposium, Harold Varmus, director of the National Institutes of Health (NIH), summed up the comparative prospects for NIH and the National Science Foundation (NSF) in a carefree manner: "The NIH hasn't lost its enemy" (that is, disease). If Varmus had needed comfort, it was provided by the speakers from Capitol Hill. NIH was praised. No one criticized it. In contrast, none had a good word to say about NSF. There were only criticisms and threats. The facts are that NSF has been an effective agency and has had a substantial role in establishing the United States as a world leader in scientific research. In part because of congressional mandates, only a few hundred million dollars are available annually to fund research in the physical sciences. Most of that money goes to universities, where it is important in the education of scientists.

The potential of diminished federal support for the physical sciences comes at a bad time for universities. Many are already under financial pressures and are in no condition to remedy shortfalls in research support. State legislatures have cut budgets for public institutions. Tuition rates are already excessively high at private universities. With ceilings imposed on indirect costs, institutions must bear part of the expenses of research. Universities are already finding it necessary to consider diminishing the size of research staffs, including fellows. Flexibility in contraction is lessened by the federal mandate forbidding automatic retirement of faculty at age 70.

An enormous accumulation of knowledge in physics and chemistry has occurred during the past 50 years. Part of that knowledge is being utilized by industry. Some has been exploited to produce instrumentation that has made possible great advances in other areas of science such as astronomy, geophysics, and molecular biology. Magnetic resonance imaging is slated to displace x-rays in diagnostic medicine. Lasers are being employed in many curative procedures. The list of medical applications could go on and on. More medical applications of chemistry and physics will be discovered. Every event that occurs in living things is a complex manifestation of a combination of chemistry and physics. Understanding the chemistry and physics of other aspects of the world around us gives humans the power to change their environment in ways better to provide food, clothing, shelter, and amenities.

The exciting frontiers of basic research are likely to be predominantly in areas that apply chemical and physical principles. However, if the great wealth of existing knowledge is to be exploited most effectively, the nation must have a cadre of scientists who provide dynamic, expert, living knowledge of the information which—if only buried in books—is relatively lifeless. That knowledge is made available by faculty and, more importantly, by a flow of university graduates. The students achieve their expertise by participating in university research. Interrupting the flow of NSF funds to chemistry and physics faculties would likely cause far more damage to the industrial enterprise than could be balanced by giving industry authority over the few hundred million dollars. The powers in Congress would do well to consider advice proffered at the forum.

In her remarks, Dr. Virginia V. Weldon of Monsanto Company said, "As a physician my primary advice when government considers how to maintain our lead in science is to remember Hippocrates: 'First do no harm.'"

Philip H. Abelson