

In Quotes: A Contrary View on Scientist "Shortage"

From an article, "I Never Promised You First Place," by Iris C. Rotberg, a Program Director in the National Science Foundation's Directorate for Education and Human Resources, published in the December 1990 Phi Delta Kappan, journal of Phi Delta Kappa, professional education fraternity (Bloomington, Indiana).

... an analysis of SAT mathematics scores shows that there is no problem with the supply of highly qualified students. These scores have actually improved in recent years. In 1977, the 90th percentile score was 628; in 1986, it had risen to 642. The reason that a smaller proportion of high-achieving mathematics students chose to study the physical sciences or mathematics has nothing to do with any lack of proficiency in these fields. These students are simply aware of projections that show that the physical sciences (with the exception of materials science) are not expected to be high-growth fields in the 1990s. And they are not unaware of the fact that other fields, such as engineering, business, and law, are more financially rewarding. They also want to pay their loans

Economic studies over the past 30 years generally support the assumption that the labor market for scientists and engineers does make the necessary adjustments, although there may be temporary spot shortages because of the time needed to complete the educational process. Nor is there any reliable evidence that the business community is complaining about the numbers or quality of mathematicians, physicists, chemists, or engineers being turned out by US universities. . . .

I believe that the most difficult challenge may not be improving the quality of education for science and engineering majors, but providing a better education for other students—who represent the large majority—in a world requiring ever-greater technological skills. . . . Moreover, US society will become increasingly polarized if a significant proportion of our population lacks the skills needed to compete for jobs that provide a reasonable income. . . . And because poverty correlates so highly with educational problems, these problems are likely to be exacerbated over the years if the current trends continue.

Expenditures on education also greatly favor the most affluent regions, schools, and students. The fact is that low-income and minority students, on average, have less opportunity to study science and mathematics than do other students. . . .

The public perception that the US is falling behind in science and mathematics . . . is based on a narrow criterion that has serious methodological deficiencies. The risk is not simply that we will underestimate our accomplishments. Of far greater importance is the likelihood that too narrow a definition of the problem may lead us to "solutions" that are at best trivial and may indeed be counterproductive to addressing more important problems. It is unlikely that

increasing requirements for traditional science and mathematics courses or memorizing facts that can be readily assessed on standardized tests will encourage greater numbers of high-achieving youngsters to become scientists and mathematicians or give young people who do not attend college the skills they need to compete in the marketplace.

Clearly, we have problems in science and mathematics education. But the bottom line is not so grim as the current rhetoric would have us believe, nor are the problems identified by that rhetoric necessarily the ones that are most troublesome to the welfare and productivity of the society as a whole.

Science and Congress

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that the demand by Committees exceeds the number of available candidates. What it fails to note is that Congress likes visiting Fellows because they come free—paid for by sponsoring organizations. If a committee or member really wants a staffer, money is found for salary.

As for bringing the Academy into closer ties with Congress, the problem there is that the Academy can't shake the image of Washington tub thumper for academic basic science. The reason is clear: the Academy is a Washington tub thumper for academic basic science, no matter how intense its protestations of purity and objectivity.

The big legislative problem weighing on the scientific community is an antiquated layout of committee jurisdictions that puts science agencies in direct budget competition with politically powerful social-welfare agencies. The most glaring example is NSF, which must contend for the same pot of money with the Department of Housing and Urban Development and the Department of Veterans Affairs.

The Carnegie report doesn't engage that problem directly, but it's not unlikely that the report's mass of verbiage on advice and consultation is really aimed at eventually reworking the jurisdictions. The problem is hinted at in various references to the complexities of Congressional committee jurisdictions.

The panel says it will issue three more reports: on OTA and the various other Congressional support agencies, on "Congressional procedures, including appropriations, authorizations, and oversight of S&T programs," and on "ways that Congress can gain a longer-term perspective on S&T issues, executive-legislative branch interactions, scientific literacy, how an informed electorate influences the congressional agenda, and the role of the media in informing the public of S&T-related issues."

It may be hoped that the forthcoming reports will address an uncomfortable fact of Congress and science, namely, that when legislators go looking for scientific advice, their main goal is to find some political advantage. For example, members of the Texas delegation won't believe anything unkind about the Superconducting Super Collider.

Congress Urged to Upgrade Its Science Advice

Distracted by the fiscal needs of social and welfare programs, Congress is often the barrier to more money for the National Science Foundation and other civilian science agencies beyond the charmed field of health research. Now a bluechip outside advisory group says Congress should reach out for more and better advice on science issues and should study its handling of science budgets and programs.

The recommendations are contained in a new report, *Science, Technology, and Congress: Expert Advice and the Decision-Making Process* (44 pp., available without charge from the Carnegie Commission on Science, Technology, and Government, 10 Waverly Place, New York, NY 10003; tel. 212/998-2150).

The Carnegie Commission is a kind of government-in-exile on science that for the past several years has been issuing reports on various aspects of science-government relations. Its impact on real affairs has so far been difficult to discern. But, staked by the Carnegie Corporation, the Commission draws big names, mostly Democrats, plus some civilized Republicans. It may reasonably be speculated that if the Democrats ever regain the White House, the Commission could, formally or informally, serve as the starting point for the presidential science-advisory apparatus. The panel that produced the report was chaired by former Congressman John Brademas, President of NYU. Serving with him were Jimmy Carter, Florida Governor Lawton Chiles, former Senators Daniel J. Evans and Charles McC. Mathias, and former White House Science Adviser H. Guyford Stever, workhorse of the Washington science-policy circuit.

The report recommends creation of a bi-partisan Congressional Science and Technology Study Conference, and urges Congress to "encourage the establishment of a non-profit Science and Technology Institute to provide weekly bulletins, briefings, legislative analyses, workshops, training, and conferences on major issues before Congress." The

Budget

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ucts, but knowledge that will be broadly applicable; (3) the need is urgent; the issues to be addressed require action now and cannot be delayed or taken up piecemeal; and (4) there are broader benefits, which are difficult to quantify, related to protection of the environment and public health."

The budget reflects the ideological muddle of the Bush Administration. If the Cold War is over, as Mr. Bush himself has proclaimed, why would he have defense R&D grow faster than civilian R&D? Why are increases proposed for nuclear-weapons research at a time when military requirements are focused on conventional weapons? Why is the barrage of inspirational talk about education and industrial competitiveness accompanied by a paucity of money?

The answer is that ideological dissonance still rages behind the "good budget" presented by Dr. Bromley.—DSG

report adds that the Institute "could coordinate the preparation of rapid-response analyses for Congressional committees and individual Senators and Representatives. This effort," it explains, "might include rapid-response analyses by experts in academia, industry, nongovernmental organizations, and elsewhere."

It also urges Congress to make direct use of the advisory services of the National Academy of Sciences. "Congressional authorizing committees," the report states, "could be appropriated funds specifically for the purpose of requesting studies by the National Academy of Sciences complex, and perhaps by other non-government organizations." Offering another approach, the report states that "Congress could make an endowment grant to the Academy to allow compensation for studies initiated at the direct request of congressional committees."

Reflecting its establishment roots, the report also comes out against earmarked, or pork-barrel, appropriations for scientific facilities. It's by this route, of course, that havenot states and institutions have been getting shares otherwise denied to them. The report urges that "Congress more frequently use the results of the scientific merit review process in making decisions on the funding of science and technology projects and facilities." It concedes that pork-barreling arises from both a dearth of funds and doubts about the equity of the reigning distribution system. "Nevertheless," the report states, "the product of merit review—a ranking of proposals based on technical merit—can serve as an effective guide when making many science and technology policy decisions."

What the report fails to note is that the Congress, along with the rest of the capital, is awash with scientific advice, solicited and volunteered. It casually suggests that the proposed Science and Technology Study Conference could "augment" two major founts of legislative science advice and information, the Congressional Office of Technology Assessment and the Science Policy Research Division of the Congressional Research Service. But the report's several references to the two agencies fails to recognize their value to Capitol Hill.

OTA annually produces scores of deeply researched and well-organized reports for Congressional committees, and it has demonstrated a capacity to do them long or short, fast or slow, contrary to the report's assertion that OTA reports "typically take 12 to 24 months to produce." The Science Policy Research Division of the Congressional Research Service specializes in fast and short studies for its Congressional clients.

Congressional committees responsible for scientific and technical matters are well-staffed with appropriately trained professionals, regular staffers and visiting fellows. The report notes that over 450 Congressional Science and Engineering Fellows have served in Congress since 1973, and

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