Appendix A: Report of a Joint AAAS/NACME Conference

Overview

The American Association for the Advancement of Science (AAAS) and the National Action Council for Minorities in Engineering, Inc. (NACME) hosted an invitational meeting January 15–16, 2004, in Washington, DC, focused on efforts to enhance minority participation in science, technology, engineering and mathematics (STEM) education and careers.

Over 180 distinguished policymakers, higher education officials, attorneys, program developers, and researchers participated in the conference the first day, followed by 100 who met in seven workshops the next day. One expected outcome was a report consisting of action items and an outline of next steps for sponsors, educators, and other stakeholders seeking to support STEM diversity. (No speakers are attributed below.) Other resources are posted at http://ehrweb.aaas.org/aaconf/ and will be updated as a service to colleagues grappling with the issues addressed in the conference and workshop. The conversation must continue. As one speaker put it," we seek solutions, not privileges, and a national policy dialogue that sharpens the focus on how to judge talent and invest in all."

The conference and workshop was prompted by inquiries to AAAS and NACME about issues of policy and practice that have arisen since the Supreme Court decisions in *Grutter v. Bollinger* and *Gratz v. Bollinger* (June 23, 2003), which reaffirmed the value of diversity in making admissions decisions and clarified what admissions practices are allowed. Murky still are questions about ongoing efforts, precollege to workforce entry, to support minorities in STEM careers. To clarify what is judicious and strategic, the meeting focused on three broad questions:

1. What is allowed—and prohibited—in recruitment, admissions, financial aid, and special programs and activities for enrolled students?
2. Are efforts currently in place legally defensible, likely to achieve the ends for which they were designed? Are they both effective and compliant with the law?
3. How do we move forward, informed by the input of research, evaluation, and the wisdom of practice, coupled with guidance from the Court?

Rationale and Charge

This was a conference about means, not ends. The participants were invited because they support a diverse workforce and the student body that will sustain it. As the title of this report, excerpted from Lyndon Johnson's commencement address at Howard University in June 1965 augurs, achieving these ends will pose enormous challenges to institutions of higher education, especially those determined to support diversity in populating their campus communities. In the words of attorney Martin Michaelson, circa 2003, "To the extent that they have implications for affirmative action in faculty and staff recruitment, hiring, and promotion, in student aid, and in other

areas, the [Supreme Court] decisions affect nearly every academic institution in the country."[1]

We are 50 years from *Brown v. Board of Education,* and 25 from *Bakke*. Thus, race-conscious policies have been the law of the land for much of recent U.S. history. Without such sensitivity in college admissions decisions, higher education would simply reproduce historical inequities in preK-12 preparation. Thus, colleges and universities must formulate strategies and practices that afford opportunity while maintaining fair and competitive processes. And the partners of academic institutions are rallying to support what works and what other approaches should be considered on campus and in their own organizations.

Why science and engineering? Since NDEA—the National Defense Education Act of 1958 (PL 85-864)—these have been recognized as significant disciplines for the nation's well-being, especially for federal investment at the graduate level. College-educated, graduate-trained people matter. If minorities and women participated in the science and engineering workforce proportional to their presence in the general population, there would be no U.S. talent gap. That is why a focus on STEM at all levels of education is vital.

Those who have worked on participation for all students know that "getting in" is only a small part of the battle.[2] It has been demonstrated time and again that the success of these students in STEM fields requires more intervention, more outreach, more support, research opportunities, retention efforts and more mentoring than is usually offered in the typical program, especially in research-intensive universities. In contrast, liberal arts colleges and minority serving institutions have traditionally done a much better job in offering a supportive environment.

At a time when the policy climate is revisiting and renegotiating, if not redefining, concepts such as academic selectivity, race surrogates, underrepresentation, critical mass, privilege, denial of rights, affirmative action, and discrimination, legal scholars remind us that the Court decisions do not *require* diversity programs, just permit them. Therefore, initiative resides with institutions and those who lead them. As one lawyer observed, "this is a 'constitutional moment' for defining the educational mission in a democracy. We must reassert education as a public, not a private, good. Higher education cannot be picking winners and losers. We are fighting for the soul of America."

For grounding, the conference highlighted research and data on demographics, enrollments, degrees, and composition of the workforce. For perspective, it introduced separate panels of representatives from academe, industry, and government, leavening these views on how policy and practice can promote the participation of all in science and engineering with the legal opinions of the panel moderators.

While looking back to establish historical context, the conference fixed on the future. We were ever-mindful that Justice O'Connor's brief articulated a vision of an academic world 25 years hence without the need for measures that assure equal opportunity and treatment for all. Together, the participants were charged with detailing a vision with concrete actions, a timetable for progress, and collective strategies—both compelling and nuanced—for sustaining a diverse corps of students, faculty, and knowledge workers circa 2030.

The Conference: Setting the Stage

To begin to explore the guiding questions of the conference, the organizers deemed it necessary to establish the context for discussion. We used the lens of history (admittedly, with a public-policy-inside-the-Beltway focus): Where did efforts to broaden the talent pool originate, how were they manifested, how have they evolved, and what have we learned?

A 30-year retrospective clarifies not only milestones in minority STEM participation, but also the epochs around which events crystallize (The complete timeline can be found in Appendix B).[3] They represent an evolution of approaches that reflect learning in the face of shifting public policies and public opinion.

The civil rights movement, propelled by the Great Society programs of the 1960s, defined the issue of opportunity, in President Johnson's stirring words, "as not just equality as a right…[but] equality as a result." With the need to increase both the visibility and advancement of women and minorities, institutions began to converge.

Intervention programs appeared; professional society committees were formed; resolutions were

passed; explicitly minority-serving organizations formed; Congress mandated programs, often aimed at Historically Black Colleges and Universities (HBCUs); and some nonprofits like AAAS began to document the dimensions of the challenge. The mantra was: we've got to *do* something.

For example, in 1971 the AAAS Council passed a resolution of support for these ideals that led to the establishment of a Committee and Office of Opportunities in Science to oversee the course of this work within the Association. The American Chemical Society established Project SEED, a program for "disadvantaged youth" in 1968. MESA began in California in 1970. Scientists at Lawrence Livermore Laboratory developed inexpensive science materials for use in the Oakland schools in the late 1960's. Efforts focused on trying to improve the quality of school science and mathematics. Concerns from industry about the adequacy of the numbers of minority engineers and scientists available for employment led to the formation of the National *Advisory* [later, *Action*] Committee for Minorities in Engineering, or NACME, under the auspices of the National Academies.

Universities put initiatives in place. Agencies organized and funded programs, often aimed at institutions, first HBCUs, later Hispanic Serving Institutions and Tribal Colleges. These would include MISIP at the National Science Foundation, Preface at DOE, and the MBRS/MARC Programs at NIH (see www.nigms.nih.gov/news/mpusummer02/history.html).

By 1975, we had recognized the need for data disaggregated by sex within race/ethnicity since both factors interacted to shape educational experiences and workforce opportunities. AAAS in particular was challenged to include concerns about persons with disabilities within the mandate of the Committee and Office of Opportunities in Science. This was done in 1976, and soon concerns about persons for disabilities in the STEM talent pool and workforce were added to CEOSE and, in a later reauthorization, as an amendment to the Equal Opportunities Act of the NSF. Disability legislation affected access to schooling, to university, and to the workplace.

The population of "persons with disabilities" is one that any person can join at anytime. And the barriers to opportunities thus presented, especially when added to race and/or sex, mean that a much more sophisticated and nuanced view of interventions need must be incorporated into our analyses.

In a 1976 report, *Programs in Science for Minority Students, 1960–1975,* Malcom, Cownie and Brown identified 355 programs, more in health- and engineering-related fields than in the sciences. African Americans were better represented among program participants than Latinos and Native Americans, in part due to the fact that many such programs were based in HBCUs.

In terms of level, over 45% of programs were aimed at the undergraduate level exclusively, while only 7% and 18% were specifically aimed at elementary and high school levels, respectively. In those programs operating at multiple levels 41% had some pre-college involvement though there was little opportunity or deliberate strategy for follow through. The authors concluded:

> *"it is clear that special programs, while absolutely essential to increasing the numbers of minority group members entering the sciences, address only part of the problem and are only part of the solution. Increasing doubt as to the future of special programs gives an additional indication that major institutional change is absolutely essential if significant and continuous increases are to be made in the participation of all these groups in science, engineering and health fields."*

This focus on finding the individuals with interests and capacity extended through to the graduate level, such as with the creation in 1978 of the congressionally mandated MGF program at NSF. A notable exception to this emphasis on individuals was the NSF Resource Centers for Science and Engineering, also a congressionally-mandated program promoted by many within minority science and engineering organizations, such as SACNAS and NOBCChE, that urged more holistic, longitudinal, and system-wide efforts.

The 1970s had intensified the targeting on individuals and set-asides known as "special programs." Then came *Bakke,* affirming the value of diversity in higher education but sending mixed messages about the future of special programs. Despite these efforts, the numbers, while increasing, were not moving significantly for minorities. The realization that competi-

tion among fields would not increase the overall pool of talent, and that there was a need to start *much* earlier to identify, inform, and develop students.

Consequently, the early 1980s spawned the concept of "pipeline" and programs that emphasized academic preparation and career decisionmaking by high schoolers. The effectiveness of programs—more students, better preparation for the dollar—was asserted, but seldom evaluated. Specific legislation that articulated the federal stake was vitally important. With the passage of the NSF Equal Opportunities in Science and Engineering Act of 1980, a federal agency was charged with the responsibility of increasing participation in science and engineering by underrepresented groups. NSF remains unique today among the federal R&D infrastructure with that charge.

But the impetus in the early 80s yielded landmarks reports rather than results. Indeed, the Reagan Administration shut down science education at NSF in 1981, derailing the strategic vision outlined in the Act. Two years later, we were declared "a nation at risk," and in that same year the National Science Board published an overshadowed report including a rationale for investment in human resources for science and engineering, *Educating Americans for the 21st Century*. It included an inventory of programs from the previous era aimed at minorities, women, and persons with disabilities, and codified lessons that seem unremarkable yet prescient by today's standards.

AAAS' *Equity and Excellence: Compatible Goals* offered a blueprint for uniting, rather than choosing between, the goal of participation and the goal of science and engineering strength. It observed that:

- programs were created & existed in a kind of "parallel universe" to schools as a way of helping students survive in a system unsupportive of SMET career aspirations or preparations;
- the most successful efforts focused on enrichment rather than remediation, had broad partnerships, good teachers with high expectations for students, parental involvement, opportunities to "do science," project based work, careful targeting, and long term involvement with participants;
- most tried to track outcomes for their students; and
- over time the most successful projects managed to worm their way into school systems to affect teachers, curriculum and/or career orientation. By just "following their instincts" (sometimes even informed by evaluation and feedback), many program developers had found lessons to inform us all: that quality science and mathematics in a supportive and challenging environment could produce the results we all desired.

By now Congress was actively directing the R&D agencies to create programs for bringing more women & minorities into the S& E workforce. As concerns about the adequacy of the workforce grew (especially in light of emerging demographic shifts), Congress charged the Office of Technology Assessment with looking more carefully at the human resources base of the United States, as well as how the system of federal support contributed to the production and sustenance of that base. A series of path-breaking reports from OTA[4] connected the underparticipating groups and their "parallel universe" to the fate of the larger scientific and engineering enterprise.

After the OTA reports framed the S&E enterprise in terms of national need, the expectations for the universities—as the primary actors in the integration of research and education—were explicit. Their attention to the composition and adequacy of the S&E workforce, in addition to the production of knowledge, grew accordingly.

In the late 1980's, the demographic era was in full swing. AAAS undertook a study of intervention programs in universities, reporting its findings in reports such as *Investing in Human Potential: Science and Engineering at the Crossroads* (Matyas and Malcom, 1991). The university became the unit of analysis rather than individual projects, and an attempt was made to see what was in operation, how they were organized and situated within the institution. The dominant model was a collection of unconnected, uncoordinated non-interacting projects. Though many were effective and others noteworthy, taken together they did not move toward institutional change. Their funding base was fragile and there was often little knowledge of or sharing of lessons across efforts on the same campus.

At about the same time, the Carnegie Corporation of New York funded a comprehensive study and planning effort to set out goals and strategies for achieving Quality Education for Minorities, including goals

related to S&E participation. The study, originally conducted as a project based at MIT, evolved into the founding in 1991 of a separate independent organization, QEM, headed by one of its founders, Shirley McBay.

In 1990 AAMC undertook to dramatically increase the number of American Indians, African Americans, and Latinos in medical education. Project 3000 by 2000, directed by the late Herb Nickens, involved working with medical schools to identify effective efforts and to share these more widely. Medical school enrollments did rise for minority students, reaching a peak in 1994.

But with the Adarand decision, Proposition 209 in California and Hopwood in Texas, all happening in 1995, enrollments dropped. From 2,014 matriculants in 1994 and about the same number in 1995, medical school enrollees fell to 1,906 in 1996 and then to 1,770 in 1997. The number of placements remained the same at about 17,000 students. California and the Hopwood states accounted for 82% of the decrease in underrepresented minority matriculants between 1996 and 1997.

AAAS sought to determine whether similar losses had occurred among minority students in terms of first-year enrollments in graduate education in S&E. With support from the Sloan Foundation and in partnership with the Council of Graduate Schools and the Association of American Universities, we surveyed 93 Research I institutions to determine first year S&E graduate enrollment by broad field for 1994–45, 95–96, 96–97, and 97–98 for African Americans and Hispanics. We also visited 10 representative campuses and spoke with majority and minority students, graduate school leaders and staff, and S&E faculty. The surveys showed the same pattern of decline as seen in medical schools, steadily increasing or stable numbers through 1996, with a decline of roughly 20% and over 16% for Blacks and Hispanics, respectively, in natural science, computer science, mathematics and engineering fields (contrasted with an overall decline that was about half this).

Visits to the campuses revealed the uncertainty and confusion of administrators, post-*Adarand*, about what was or was not allowed in terms of recruitment, outreach, and admissions. In the face of this uncertainty, they often backed away from earlier efforts. Combined with the fragmented nature of decision-making regarding graduate school admission and financial aid, it was difficulty to identify a clear target for intervention. In retrospect, one might ask why we entertained any expectation that the graduate enrollments might be increasing. The effectiveness of the NSF Louis Stokes AMP program had greatly enhanced the size of the pool; and its focus on undergraduate research experiences had primed the pump for universities seeking talented minority students.

The Sloan Foundation funded AAAS, in the wake of the 1995 Adarand decision, to conduct a workshop to examine the changing policy climate and its effect on efforts to achieve STEM diversity. Two major recommendations that emerged are still valid today: the essential need for structural reform in higher education; and a call for rigorous review, reassessment and realignment of existing programs, to wit, "A strategic, ongoing review to assess the effectiveness, the adherence to best practices, and the long-term effect on the educational system is long past due."

Soon thereafter in the late 90s, and at the request of Senator Robert Dole, the CRS of the Library of Congress, collected "any statute, regulation or executive order which appears, in any manner, to prefer or consider race, gender or ethnicity as factors in federal employment of the allocation of federal contracts or grants to individuals of institutions." Within the Clinton White House, the President's Initiative on Race and a five-month study was underway.

The resulting publication, "Affirmative Action Review: Report to the President," ushered in the era of "mend it, don't end it."

The review within agencies led to:

- a reshaping of their program portfolios (for example, changes in eligibility language or the discontinuation of targeted efforts focused on individuals);
- a reframing of program rationale (from more minority physicians and/or biomedical researchers to the tools and personnel to address minority health disparities);
- more efforts aimed at institution-wide change (e.g., NSF's ADVANCE), at strengthening the capacity of minority serving institutions, and of building connections among research universities and MSIs;

- the search for surrogates of race/ethnicity; and
- a consolidation and disappearance of special programs as the impact of the Government Performance and Results Act began to ripple through the Congress, enshrining "accountability" as the touchstone of budget blessings.

By the new millennium, there was a clarion call for institutional change. The report of the Morella Commission, *Land of Plenty* (2001), articulated the national interest in research-based program design and practice. With the creation of the public-private partnership BEST (Building Engineering and Science Talent) as implementation of the Commission's work, we await the next installment of community-wide, cross-sectoral efforts to test the BEST design principles, as embodied in three forthcoming reports (www.bestworkforce.org).

In 2004, the beginning of an era demarcated by the Michigan Supreme Court decisions, we must assess the environment for participation of all in science and engineering. We turn to the communities of K-12, higher education, and workforce specialists who, along with other citizens, share a stake in America's future. Representatives of those communities offered perspectives at the Jan. 15 conference—through university, government, and industry panels—that moved the conversation forward. Below we summarize those panels and the stage they set for a day of concurrent workshops.

A. University (President) Perspectives

Higher education plays a pivotal role in meeting the challenges posed by Court's decision in *Gratz*. In the words of a Hogan and Hartson brief, "how institutional programs are conceived, expressed, and implemented …ensure[s] that the programs are appropriate under applicable legal standards and fit the institutional mission and goals."[5]

The university presidents, representing public and private institutions, described a U.S. "innovation system" dependent on an engaged citizenry. How to make science and engineering careers attractive to domestic students is now an imperative. Higher education in particular must work to diversify the student body and not blame the K-12 sector for loss both of interest in science and engineering and the competition of these professions for fresh talent. Staying the course and leveling the playing field will render the debate over special programs moot.

But building a diverse student body, especially in the most selective institutions, takes decades of work, dedicated programs and staff, and recognition that a complex web of factors underlies the performance gap. Witness the inescapable reality that economic proxies may attenuate the effects of race/ethnicity, but do not erase them. As we "raise all boats" in teaching, learning, and the quality of student life—mentoring and peer tutoring *do* make a difference—the need to target efforts persists. Bridge programs and other pre-college outreach activities work. If we eliminate targeting, gains in preparation for and access to higher education by many will suffer.

One reading of the Court's decisions, then, is that we can embolden or dilute current efforts: how do we "create opportunity for some students without destroying it for others"? Perhaps the most confusing, troubling, and frustrating challenge we face is the compulsion to modify programs that work! We should resist a rush to judgment while protecting those practices that have yielded opportunities where previously they were slim or nonexistent.

If we have been granted a period of reprieve by the Court's pronouncement, then we should:

- explore how the tool of affirmative action may be used to fortify states and campuses backing away from race-conscious programs, not only in undergraduate admissions but also in financial aid. The next arena for legal contention is state legislatures.[6]
- learn about and export successful programs, including the context in which they thrived; and
- extol and point to extraordinary leadership—both within the higher education community and beyond in industry and government.

Finally, the university presidents warned of a splintering among groups as we devise multiple "solution paths." If we are to change the debate, the link between education and democracy must be strengthened. The problem is embedded in a larger space of grander scale. It demands public will. For at the end of the day, diversity is an issue of social and political justice. The science and engineering communities must therefore join the public policy fray. How to weave diversity into the fabric of higher education's

mission and values is a test of leadership, of resource distribution, of partnership among institutions.

Outstanding questions: What discretion do institutions have over the programs they offer? Does it vary with the source of funding? Are private institutions more or less advantaged in pursuing diversity? What, if anything, might differ in their responses strategies?

B. Federal Government (R&D Agency) Perspectives

Since the Great Society programs of the 1960s, the federal government has been at the forefront of assuring equal opportunity as a compelling interest in American life. Pell Grants and others financial aid programs that make college a reality for many. But science and engineering education is a particular area of human resources investments—through graduate fellowships, traineeships, and research assistantships (tied to individual investigator and center grants). Six R&D agencies—NIH, DOE, DOD, USDA, NASA, and NSF—provide the lion's share of support for the production of new knowledge and the next generation of researchers/innovators.

The federal role, however, extends well beyond dollars. As an authoritative voice of science and engineering expertise, and as a symbol of the nation's capacity to innovate, the federal sector is synonymous with glimpsing new frontiers of knowledge.[7] Designing programs—preK through workplace entry—to achieve national goals and agency missions in science and engineering while maximizing opportunities for preparation and participation in the S&E workforce—in federal laboratories as well as academic and industrial settings—has long been a priority. How those efforts can be accelerated, coordinated, and scaled remains a formidable challenge.

The Court decisions seem not to have affected the way agencies allocate funds. Yet oft-heard claims that diversity enhances the scientific process, and therefore progress, lack evidence. Beyond dispute are the health disparities that can be demonstrated in access, quality of care, and the knowledge base that distinguishes, for example, disease propensities by race, ethnicity, and gender.[8]

The federal representatives, while circumspect, were unequivocal about the assets that must be preserved: the identification of student talent, the provision of cutting-edge research opportunities with world-class instruments and committed mentors, a recognition that not all scientists and engineers are PhDs, a healthy respect for skills that satisfy market needs, and the drive to push the envelope and reward what works (increasingly, by "implementation audits" of facilities and programs that document outcomes).

The use of criteria that explicitly support diverse participation by the citizen talent pool, reinforcing organizational units—centers and programs—as well as practices that leverage federal investments in the S&E enterprise, is at a premium. Unfortunately, the political climate militates against more active encouragement of minority participation by the White House or its Office of Science and Technology Policy (OSTP).

Outstanding Questions: Do institutional programs qualify as an antidote to targeted programs? When the Department of Education's Office for Civil Rights inquires about the narrow tailoring of programs funded through a department/agency, how do they respond? What would it take for OSTP to play a larger role under in coordinating diversity programs and executing congressional mandates within the missions of individual departments and agencies? In the same vein, could the National Science Foundation's Equal Employment Opportunity mandate be used more effectively?

C. Industry Perspectives

While the science and engineering workforce represents only 5 percent of America's workers, the national welfare increasingly depends on them—not only for research and innovation, but for the skills, knowledge, and excellence they bring to other occupations and fields. High-tech companies, representing in the panel the information technology and pharmaceutical industries, often say that they have made the "business case for diversity." They declare that expectation in evaluating managers' performance, awarding vendor contracts, mentoring and promoting staff, and marketing the product line. Business strategy teams build relationships and networking skills both

internal and external to the company. Diversity is visible in the bottom line.

If corporate America "gets it," then valuing diversity is intrinsic to the "knowledge supply chain." This is apparent if one sees the workforce as part of a system where teaching and learning at all ages matter. For example, higher education owns K-12 teacher preparation, so its leadership in this arena is crucial. Some also advocate more naked political action, such as universities reaching out to enlist corporate lobbyists if legal challenges to diversity programs are mounted. While politicizing the battle, it narrows risks to those that matter the most. Finally, a better mapping of corporate diversity to educational efforts could create a "DiversityInc. Top 50" for institutions of higher education. It might also modulate the stealing of "seed corn" by hiring talented minority S&Es who would otherwise pursue graduate study.

The industry voice was one in stating that the Court decisions have not changed company recruitment and hiring practices at all. They still seek graduates with abundant "soft skills"—communication, teamwork, motivation, and a problem-solving style that is open to those with diverse backgrounds and perspectives. Combined with technical knowledge, such skills afford one the versatility to excel in a corporate S&E career.

Outstanding Question: What specific challenges do different industries face relative to others in the competition for student talent?

A synthesis of the day reminded us what constitutes a national phenomenon must be confronted daily by each of us in our communities. There is a differential impact of law and policy on practice by region, university, and school district. If education values opportunity and participation, then more than career outcomes are at stake. Rather, citizenship and the constitutional right to enter the mainstream of society are protected.

The Workshops

Day 2 of the conference featured a series of work groups, ranging in size from <10 to 25 self-assigned volunteers, that met concurrently. Each group focused on a particular theme that both grew out of the conference proceedings the day before and/or was anticipated by the organizers. The themes were:

- Collaboration
- Program Guidelines
- Research/Building the Case
- K-12 Outreach
- Financial Targeting
- Graduate and Professional School Admissions

Each group was charged with assemble information, especially research findings, based on the experiences and judgments of those in the room. Anonymity was assured, with no attribution of individuals in summary reports (not to exceed three slides) presented to the full assembly by each group facilitator. The following template was suggested to help standardize the output:

1. Scope of the topic addressed by the group (what was included/excluded)
2. Knowledge base (what is known, especially with data)
3. What key information is lacking
4. Demonstrable successes: a description of what works
5. What's been tried, and failed
6. What organizations are among those to be consulted

These reports contained valuable insights that are incorporated into the design principles featured in this guidebook. In sum, they represent advice to those "on the ground" on how to "stand our ground."

ENDNOTES

1. Martin Michaelson, "The Court's Pronouncements Are More Dramatic and Subtle Than the Headlines," *The Chronicle of Higher Education,* July 18, 2003.
2. Indeed, the Sloan Foundation supported AAAS in conducting a survey to gauge the impact of the Adarand, Hopwood, and Proposition 209 decisions on graduate admission and financial aid for underrepresented minorities seeking to pursue PhDs in science and engineering at research universities. The result, a forerunner of the present report, was Shirley M. Malcom et al., *Losing Ground: Science and Engineering Graduate Education of Black and Hispanic Americans* (Washington, DC: AAAS, 1998).
3. The complete timeline can be found in Appendix B.
4. Notably, U.S. Congress, Office of Technology Assessment, *Demographic Trends and the Scientific and Engineering Work Force* (1985) and *Educating Scientists and Engineers: Grade School to Grad School* (1988).
5. In Gretchen W. Rigol, *Implications of the U.S. Supreme Court Decisions in the University of Michigan Admissions Cases.* Summary of the Proceedings. The College Board, Summer 2003, Appendix D.
6. Peter Schmidt, "Washington's Governor Proposes Amending '98 Ban to Allow Return of Race-Conscious College Admissions," *The Chronicle of Higher Education,* Jan. 14, 2004.
7. For example, last year the National Science Board held a hearing with a focus on NSF and its main research university constituency. See Jeffrey Mervis, "NSF, Academics Told to Act as If They Mean It," *Science,* vol. 301, Aug. 22, 2003, pp. 1030–31.
8. In addition, minority enrollments in the health-care professions continue to lag growth in the general population. See American Association of Medical Colleges, *Assessing Medical School Admissions Policies: Implications of the U.S. Supreme Court's Affirmative-Action Decisions,* 2003 (www.aamc.org/morediversity); Katherine S. Mangan, "Institute of Medicine Urges Health-Care Educators to Take Steps to Increase Minority Enrollments," *The Chronicle of Higher Education,* Feb. 6, 2004; and Michael Nettles, Catherine Millett, and Joyce Wahr, "The Chronic Underrepresentation of African Americans in Medicine," *ETS Policy Notes,* vol. 12, Winter 2004.