

PACESETTER

News From the Office of Technology Policy ■ Fall 1997



Building a High Tech Work Force for the 21st Century

On September 29, the Department of Commerce's Office of Technology Policy held a press conference to release its new report, *America's New Deficit: The Shortage of Information Technology Workers*. According to the study, evidence is mounting that job growth in information technology fields now exceeds the production of talent. America's fastest growing companies are finding inadequate numbers of information technology workers to staff their operations.

The findings are supported by a report issued last year by the Information Technology Association of America (ITAA) called, "Help Wanted." The report drew attention to the fact that American businesses and industry is facing a shortage of skilled IT professionals and that this shortage could have a serious impact on our competitiveness and growth.

"Since information technologies affect every sector and industry in the U.S. — from simple office tasks such as retrieving lost documents on personal computers to creating secure information networks for electronic commerce — severe shortages of workers who can apply and use information technologies could undermine U.S. innovation, productivity and competitiveness in the global market," said Commerce Secretary William M. Daley.



■ Commerce officials with business and industry leaders answer questions during the press conference releasing a new OTP report.

were formed to look at narrow and specific factors involved in strengthening the IT talent pool.

1. Basic math and science competencies;
2. The image of the IT professions;
3. Quality and productivity issues;
4. Recruiting underrepresented groups;
5. Responsiveness of higher education and industry to each other's needs;

6. Skill upgrading of the current workforce.

These task force groups will be meeting throughout the year to explore the issues and develop strategies to address them. On January 12 and 13, 1998, there will be a national convocation that is open to the public, at the University of California–Berkeley where the task force groups will report their findings; discuss strategies and talk about next steps.

For more information please contact the Office of Technology Policy at 202.482.8321. ■

At the conference, Department of Commerce General Counsel Andrew Pincus, along with Secretary of Education Richard W. Riley and executives from technology companies discussed the difficulties in finding and retaining quality workers and stressed the need for proper training and educational programs to help determine and alleviate the underlying causes of the dilemma. Senator Warner discussed his recently introduced legislation (an amendment to S1186, The Workforce Investment Partnership Act) that addresses the challenge.

The event signaled the beginning of a long-term commitment to stimulate interest in technology and to encourage students and workers to enter the field. Six task force groups, which bring together leaders in industry, government and academia,

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Technology Medalists Featured in *Scientific American* Film

The National Medal of Technology is reaching a much broader audience this year, thanks to the enthusiastic support of *Scientific American*. Founded in 1845 as "The Advocate of Industry and Enterprise, and Journal of Mechanical and Other Improvements," *Scientific American* has documented the rich history of American innovation longer than any other journal. In keeping with the spirit of the magazine's original mission, *Scientific American* is producing a documentary on the 1997 National Medal of Technology winners.

On September 17, *Scientific American* publisher Joachim Rosler and associate publisher Kate Dobson hosted the Medal winners at WETA studios to film interviews that will make up the basis for the documentary. (WETA is a Public Broadcasting System (PBS) affiliate located in Arlington, Virginia.) Alan Alda, narrator for *Scientific American's* popular FRONTIERS PBS series, conducted the interviews.

Acting Under Secretary of Technology Gary Bachula and Deputy Assistant Secretary for Technology Policy Kelly Carnes visited WETA during the filming to recognize *Scientific American* for outstanding support of the Medals and congratulate the 1997 Medal winners. The documentary will serve as an invaluable tool for promoting the accomplishments of these great American innovators and the important contributions they have made to strengthening the national economy and improving our quality of life.

"We are very proud to be associated with the Department of Commerce to raise awareness of the Medal," said Rosler. "Our magazine wants to help inspire tomorrow's technology innovators, and we think that saluting the Medal winners and their accomplishments in this film is one of the best ways to reach out to them."

Featuring Medal winners Norman Augustine (CEO of Lockheed-Martin), Ray Dolby (President of Dolby Laboratories), Robert Ledley (inventor of the first whole body CT scanner), and the team of Vinton Cerf and Robert Kahn (the "fathers of the Internet"), the film will debut at the National Medal of Technology Issues Forum. The Forum will be one of the celebratory events held in concert with the Presidential Awards ceremony scheduled for this December. Hosted by *Scientific American* this year, the Forum provides a venue for the Medal recipients to share their own experiences

as innovators and discuss the future of American technology.

During the interviews, Alda queried the Medalists on topics ranging from childhood influences to predictions for technology's future.

"I simply fell in love with the computer," Robert Ledley told Alda, recalling his first encounter with one in 1950. From that initial encounter emerged a wealth of broad-ranging computer applications. Beginning with Ledley's early efforts to develop better dentures (he was initially trained as a den-



Norman R. Augustine



Ray M. Dolby

National Medal of Technology Monograph Project in Full Swing

When George Farris, Professor of Management at Rutgers University, first volunteered to conduct interviews with 25 Medal of Technology recipients for the Office of Technology Policy, the focus was on individual monograph papers to document the winners' accomplishments and thoughts on innovation. Two years later, a team of two writers has just been selected to take the monograph interviews to the next level, publishing a series of book-length collections that explore the makings of America's leading innovators.

The team of John Adams and Julie Wakefield was selected this October as the writers for the National Medal of Technology monograph project. With the writers set to begin work immediately, the Office of Technology Policy plans to publish the first volume in the summer of 1998.

Both Adams and Wakefield have solid portfolios showcasing their knowledge of and strong interests in science, technology, innovators and ideas. The Washingtonian recently featured Wakefield's cover story on health hazards in the D.C. area and Adams' profile of Robert Kahn and Vinton Cerf, two of this year's Medalists. Adams also recently wrote a special section published in the New York Times Magazine and Discover Magazine for National Science and Technology Week.

Expressing his anticipation regarding the project, Adams said, "I hope to not just explain but to vivify technology and innovation in this series of personal portraits."

For Wakefield part of the challenge of the project is making genius accessible to young people. "Too many students take a pass at science and technology," she explained. "They think it's too hard or boring or both. I think meeting these remarkably creative people, the Medalists, through these books will give young people a different perspective and encourage more of them to follow suit."

1997 National Medal of Technology Nomination Evaluation Committee

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Committee Chair Co-Chairman of the Board, Voyan Technology
- F Peter Boer
Committee Vice Chair President and CEO of Tiger Scientific Inc.
- Satya N. Atluri
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- Julie Shimer, Vice President and General Manager, Flex(tm) Architecture Solutions Division, Motorola
- John Brooks Slaughter
President, Occidental College.

tist), to computer chromosome analysis and the invention of the first whole body CT scanner, the astonishing versatility of his work amazed Alda. When asked if there was a central focus to his efforts, Ledley replied, "Yes, the common thread is the application of computers and mathematical algorithms to medicine." As simple as that.

The discussion with Vinton Cerf and Robert Kahn was particularly intriguing for its display of the unique partnership the two have forged over the years as "the fathers of the Internet." Despite the fact that Cerf was in London and participated in the interview via satellite, the discussion was obviously one among intimates as the two men prompted each other, and even at times, to Alda's delight, finished each other's sentences.

"Fathers of the Internet" is quite a moniker, but both Cerf and Kahn were quick to modestly point out that at the time of their landmark 1974 work on computer protocols, neither one quite imagined the revolution in communications their work instigated. "We had no sense of the scale that the Internet would take," Cerf said. Kahn noted that to do so would have meant envisioning "the breakup of the Bell system, the cre-

ation of the personal computer and the local area network, and Congress approving the use of all these federal facilities for these kind of commercial activities. I think that was a large amount for us to have swallowed back in 1973," he added.

Although Norm Augustine was recently heralded as one of the most powerful men in the world and is a leading visionary of the aerospace industry — from the restructuring of the industry in the wake of the post cold war downsizing to the development of hi-tech "smart" weapons — he was quick to tell Alda that he was only the second person in his family to go to high school and the first to go to college. Augustine emphasized that this personal experience was precisely why he feels so passionately about the importance of education.

"The chance to get that education made all the difference in the world to me, and I think we owe it to every young person in America to have the opportunity to get a first class education," Augustine told Alda. His commitment to education was further accentuated by his recent retirement as CEO of Lockheed Martin to return to the Princeton classroom as a teacher. "I

just gave my first lecture and it was an awesome experience — the students finished listening about the same time I finished talking, which I think is a good omen," he added.

Ray Dolby's interview yielded two gems of wisdom for the would-be inventors and scientists of tomorrow. First, follow your natural interests. Dolby recalled that his own interest in noise reduction grew out of his desire to listen to recorded classical music without the background hiss of "pre-Dolby sound" days. "I think a lot of developments start with the desire of the developer to get what he really wants so that he can use it," Dolby said. "It's not just the technical fascination or the business opportunity." Dolby's keen desire eventually resulted in the Dolby noise reduction system.

His second bit of wisdom is don't give up. So many people had attempted a workable noise reduction system and failed that Dolby encountered tremendous skepticism when he first presented his own. "They thought it was black magic," Dolby remembers. It took considerable time and energy to convince the skeptics otherwise, but Dolby prevailed. The rest is history, and Dolby's name is in nearly every household. ■



Robert S. Ledley



Vinton Gray Cerf



Robert E. Kahn

OTP BIOTECH REPORT IS RELEASED AT BIO COM '97 CONFERENCE



■ Deputy Assistant Secretary Kelly Carnes with San Diego Mayor Susan Golding at a press conference for an OTP report on the biotechnology industry, released in conjunction with the Cal Bio '97 summit.

San Diego recently hosted the Bio Com '97 conference where Department of Commerce Deputy Assistant Secretary Kelly Carnes, joined San Diego Mayor Susan Golding who hosted

a press conference to release the new OTP report entitled *Meeting the Challenge: U.S. Industry Faces the 21st Century, The U.S. Biotechnology Industry*.

While in town for the conference, Deputy Assistant Carnes and Joe Raguso, Executive Director for the San Diego Regional Technology Alliance, were guest on KPSB talk show "These Days with Gloria Penner." The discussion topic was the importance of technology and biotechnology to San Diego.

Deputy Assistant Secretary Carnes also held a roundtable discussion with area business leaders on a wide range of topics including international trade and technology. A second roundtable was hosted by Julie Meier Wright, President and CEO of the San Diego Regional Economic Development Corporation with Acting Under Secretary Gary Bachula on the shortage of information technology workers in the San Diego area. ■



■ Deputy Assistant Secretary Kelly Carnes with KPSB talk show host, Gloria Penner and Joe Raguso, Executive Director for the San Diego Regional Technology Alliance.



■ Acting Under Secretary Gary Bachula with host Ann Randolph, Managing Director of BioCom, and Dr. Duane Roth, Alliance Pharmaceuticals CEO, at a reception of the Cal Bio '97 summit where Bachula addressed San Diego's biotech CEOs.

NOMINATION EVALUATION COMMITTEE MAKES EXTRAORDINARY CONTRIBUTION BEHIND THE SCENES



■ Richard J. Elkus, Jr.
1991-93, 1994-97

Before the President of the United States or the Secretary of Commerce ever sees a nomination for the National Medal of Technology cross his desk, an independent

team of the nation's top technology experts-engineers, scientists, entrepreneurs, patent lawyers, and researchers-spend hours pouring over boxes and boxes of carefully crafted applications. The National Medal of Technology Nomination Evaluation Committee deserves tremendous credit for establishing the impeccable reputation of the selection process.

Headed by Richard Elkus, Jr. as Chair and F Peter Boer as Vice Chair, the committee is responsible for scrutinizing each nomination received through a nationwide, competitive nomination process.

The 1997 National Medal of Technology awards ceremony will mark the end of service for three highly valuable Committee members, Boer, President and CEO of Tiger Scientific, Inc.; Sandra Donovan, President of Donovan Associates; and Elkus, Co-Chairman of the Board of Voyan Technology and a member of the Board of Directors for KLA-Tencor Corporation and Lam Research Corporation. During

their tenures which have bridged two Administrations, the Nation has greatly benefited from the insight, professionalism and continuity they have individually brought to their service on the Committee.

Commerce Secretary Daley will honor the three departing members with a special citation for their distinguished service at this year's Medal awards ceremonies. The citation commends the members for their commitment to "furthering recognition for the important contributions America's greatest technological innovators have made to strengthening the American economy and quality of life." ■



■ F. Peter Boer
1992-94, 1995-97



■ Sandra S. Donovan
1991-93, 1994-97

Highlights of Acting Under Secretary Bachula's Trip to Japan

Acting Under Secretary Gary Bachula, along with Phyllis Genter Yoshida and Patti O'Neill-Brown of the ITP staff, had a successful trip to Japan the week of October 19. In addition to participating in the U.S.-Japan Joint High Level Committee meeting chaired by White House Science Advisor, John M. Gibbons, Bachula held talks with the head of Ministry of International Trade and Industry's Agency of Industrial Science and Technology to review activities under the Civil Industrial Technology (CIT) Arrangement, and to engage in a policy dialogue on the challenges facing both nations in stimulating technology and innovation.

The CIT Arrangement is a bilateral agreement between the U.S. Department of Commerce's Technology Administration and the Agency of Industrial Science and Technology (AIST) of the Ministry of International Trade and Industry. It facilitates mutually beneficial science and technology collaboration by bringing together U.S. and Japanese researchers to collaborate in a number of areas of research, to exchange information, and to undertake other activities.

Acting Under Secretary Bachula also held meetings with other Japanese government officials from MITI and the Science and Technology Agency. He visited research facilities in Kanagawa, Tsukuba, and Tokyo and had an opportunity to see how Japan's stated policy to create an indigenous base for technology development is being played out.

The Japanese Government, through heavy expenditures in basic scientific research and measures to develop a "creative-thinking" society, is pursuing a policy which, it is hoped, will lead to the homegrown capacity for technology creation. It

is likely that such measures will stimulate Japan's technology development, since many of the elements in the environment which allow creative thinking are already in place.

Japan is well-known for its quick pace from basic research to leading edge products. The Japanese are pursuing many areas of basic research with an eye toward how the results of such research can feed into the development of applied technologies that are foremost of Japan's agenda.

Software development is one of Japan's top priorities. It is no surprise that one of the target areas for basic research is neuroscience. Playing "catch-up" in software development, Japan is well placed to take the fruits gained from fundamental neuroscience research and feed them into software development efforts. Furthermore, Japanese software development can be aided by an application of the advances that have already made in complementary fields to software, such as robots. The U.S. group saw examples of cutting-edge developments in robotics at the Electrical Technical Laboratory in Tsukuba Science City. The fundamental principles informing the behaviors and operation of the robots could easily be transported to inform the basis for the behavior and operation of software agents.

At NTT, the group saw developments in communications technologies, including those via satellite.

OTP is advocating inter-ministerial cooperation on the U.S.-Japan Joint Optoelectronics (JOP) Project which is a project under the Real World Computing Project (RWCP). Currently, the Ministry of International Trade and Industry is the only Ministry on the Japanese

side which participates in JOP, while on the U.S. side, many agencies participate. Opening up partic-



ipation to other ministries would be beneficial to both the U.S. and Japan, since this would allow for expanding the activities pursued under the project to other areas of optoelectronics beyond computing.

If we are successful in working with the Japanese to restructure the agreement when its renewal time rolls around, in addition to having served the immediate need to access broader elements of Japan's science and technology base, we will have also created a new model for interagency and interministerial cooperation.

For information on the U.S.-Japan Joint High Level Committee; the U.S.-Japan Joint Optoelectronic Project; the CIT Agreement or any other questions concerning U.S.-Japan S&T policies please contact Patti O'Neill-Brown at 202.482.6805 or poneillbrown@doc.gov ■

■ Acting Under Secretary Gary Bachula compares notes with Japanese scientists at Techno Growth House in Tsukuba Science City, Japan.

Japan is well-known for its quick pace from basic research to leading edge products.

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