

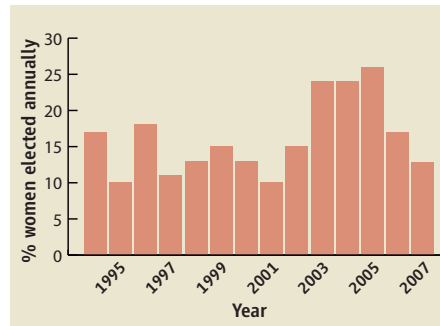
GENDER EQUITY

Women Are Scarce in New NAS Class

The number of women elected this year to the U.S. National Academy of Sciences (NAS) is the smallest since 2001 and fewer than half the number chosen in 2005. Only 12% of the new class of 72 announced last week (www.nas.edu) are women, compared to levels approaching 25% earlier in the decade. The dismal showing has prompted criticism from some quarters that NAS is backing away from efforts to promote gender equality. But NAS officials say the meager crop simply reflects the persistent dearth of women at the highest levels of science.

"I am amazed that the number is so low," says Jong-on Hahm, who until 2005 served as director of NAS's Committee on Women in Science and Engineering and is now a research professor with the Women's Leadership Program at George Washington University in Washington, D.C. "They seem to have stopped paying attention to the issue."

Not so, counters Ralph Cicerone, who became NAS president in 2005. He says this year's total of nine women "is an unpleasant surprise" because activity aimed at increasing women's representation within the academy "is probably at an all-time high." The academy has been encouraging its members to identify eminent female scientists in their fields and generate "fuller lists" of candidates, says Cicerone. He says he cannot point



Wrong direction. The number of women elected to NAS this year has taken a tumble compared with recent classes.

to a specific reason why the number dipped, however, and the academy has no plans to dissect this year's process.

But Cicerone says the general underrepresentation of women in the academy is no mystery. "Even though the number of women entering science has been increasing over the years, we are seeing a lagging effect in the composition of the membership, ... since it usually takes 25 years or more of research past Ph.D. to achieve the accomplishment required to be elected to the academy," he explains.

Critics aren't persuaded by that argument. "It's the nomination process and sometimes the selection process that fails women," says Nora Berrah, a physicist at Western Michigan Uni-

versity in Kalamazoo and co-chair of the American Physical Society's Committee on the Status of Women in Physics. "Women do not lobby to be nominated, and perhaps we should do it. Also, often the selection process does not have enough women in it." Berrah is disappointed that only one of the nine new members is from the physical sciences and mathematics. NAS officials would not disclose the composition of the committee that chose nominees in that category, but it was unlikely to have been more than the academy's overall tally of 10% women.

Although they receive 43% of U.S. Ph.D. degrees awarded in the natural sciences, women face several barriers that prevent "a normal career progression," says Donna Nelson, a chemist at the University of Oklahoma, Norman. For example, she says, graduate students are sometimes discouraged from selecting a female professor as an adviser, and female professors are sometimes denied access to specialized lab equipment. Similar barriers were documented in a 1999 Massachusetts Institute of Technology study (*Science*, 12 November 1999, p. 1272). Nelson says such a climate hinders a woman's ability to assemble the necessary credentials.

Cicerone says academy members "are keen to do more" to expand the pipeline as well as identify more women candidates. One suggestion is to find rising stars early in their careers and mentor them so as to increase their chances of being elected down the road. "We hope this year's number is just a temporary lull," he says.

—YUDHIJIT BHATTARJEE

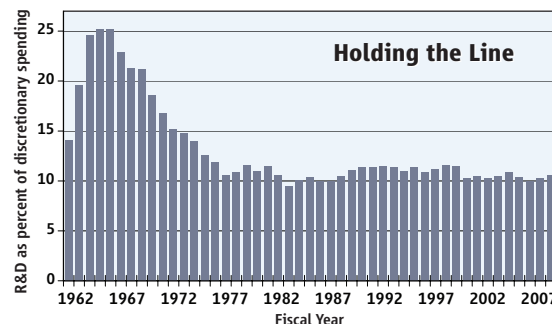
BUDGET POLICY

U.S. Science Adviser Tells Researchers to Look Elsewhere

Hardheaded realist or apologist for the Bush Administration? That's what some U.S. researchers were asking themselves last week after presidential science adviser John Marburger said they needed to rely more on nonfederal funding—in particular philanthropy and industry—to expand the scientific enterprise because Congress and the White House cannot keep up with the type of budgetary growth needed to capitalize on scientific opportunities. Several university lobbyists discounted the advice, however, saying those other sectors can't fill the gap that would be left if federal support lags.

Marburger argued his case last week at the annual Science

and Technology Forum, the largest gathering of the year for policy analysts, sponsored by AAAS (which publishes *Science*). He said that competing societal priorities have held science to a constant slice of the federal pie



The same slice. The share of U.S. discretionary spending going to research hasn't changed much since the days of the Apollo program.

for the past 40 years (see graph), and that it is unrealistic to expect legislators to grant larger, sustained increases. "I haven't seen any evidence of an increased top line for science," he told *Science* after his 3 May speech. "I think that's wishful thinking."

Marburger spoke glowingly of philanthropies willing to support basic research, citing the Kavli Foundation's network of institutes in the physical sciences (*Science*, 21 January 2005, p. 340), the myriad medical charities and patient advocacy groups, and university partnerships with industry. But many in the audience later referred to that support as "drops in the bucket" and felt Marburger was simply defending the Administration's policies.

"Yes, when you cut taxes and create a deficit and spend hundreds of billions of ▶

dollars on an unpopular war, it leaves you with precious little to spend on anything else," fumed Michael Lubell of the American Physical Society. "I don't expect to see any real changes until after the 2008 election."

Part of Marburger's comments were aimed at pending legislation that would authorize large increases at several science agencies (*Science*, 4 May, p. 672). "People probably wonder why Marburger is not more enthusiastic about these authorizations," the science adviser said in an interview. "I appreciate the desire of Congress to do this, and I feel uncomfortable criticizing them. But it's unrealistic to expect it to happen."

His dark analysis also applies to the flattening of the National Institutes of Health budget after its 5-year doubling ended in 2003, which he says created an increased research capacity that the federal government cannot support. Referring to the communities' expectations of continued robust increases, he said in his speech that "I cannot see how such an expansion can be sustained by the same business model that led to its creation. The new researchers will either find new ways to fund their work, or they will leave the field."

Michael Rodemeyer, a former longtime Democratic congressional science aide,

acknowledges that "it's politically hard" to shift spending toward science but disagrees with Marburger that there is any "iron law" fixing its share of domestic spending. But Dan Sarewitz, another former aide now at Arizona State University in Tempe, thinks that Marburger's underlying message is valid. "It's certainly reasonable to complain that the current Administration's priorities have recklessly wasted the budgetary surplus and made it impossible to make important discretionary investments," says Sarewitz. "But if this is true for science, then it's true for other areas. ... So which ones would science like to go up against?"

—JEFFREY MERVIS

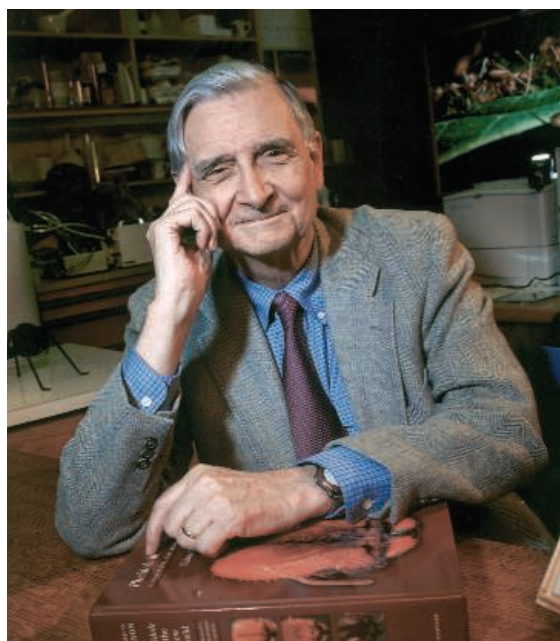
BIODIVERSITY

The Ultimate Life List

Hands up if you've heard this before: An ambitious new project promises to create an online compendium of all 1.8 million or so described species. It can already claim participation by premier institutions, a wad of start-up cash, and huzzahs from biodiversity guru Edward O. Wilson. Although some confess to a wary sense of déjà vu, taxonomists hope that the Encyclopedia of Life (EOL) can provide the long-awaited comprehensive species catalog. Even enthusiasts agree that it faces some tall hurdles, however, such as signing up curators and getting permission to use copyrighted material.

Announced this week, EOL involves big names in biodiversity research, including Harvard University and the Smithsonian Institution, and has garnered \$12.5 million from the John D. and Catherine T. MacArthur Foundation and the Alfred P. Sloan Foundation. Its plan envisions posting Web pages for each known species. EOL will also provide access to original species descriptions by teaming with the Biodiversity Heritage Library, which is digitizing the pre-1923 taxonomic literature on which the copyright has expired.

Pages on 50,000 species should be ready by the end of 2008, with 700,000 to 1 million species online by 2011, says EOL's newly appointed executive director, James Edwards. He estimates that the work will take 10 years and cost \$70 million to



Electronic ark. E. O. Wilson's idea for a Web-based encyclopedia containing all the species on Earth is now ready for launch.

\$100 million. A separate group is developing a European equivalent, known as SpeciesBase, and the two projects will swap information.

If EOL sounds familiar, that's because its brief overlaps with those of several efforts, notably the All Species Foundation, whose chair promised to deliver a Web site for every species (*Science*, 26 October 2001, p. 769). That project is defunct, but others have managed to cover slices of biodiversity. At one end of the spectrum is the Catalogue of Life, which houses bare-bones taxonomic data—the equivalent of name, rank, and serial number—for more than 1 million species. At the opposite end are lush sites

such as FishBase and AlgaeBase, which home in on specific groups and offer illustrated pages on individual species.

EOL will follow both approaches but differs from these projects in automating information collection. Software will pluck data from FishBase, Catalogue of Life, and other Web sources—a "mashup" in Internet parlance. But EOL will be a curated mashup, with experts crafting a home page for each species that records its classification, alternative names, distribution, habitat, diet, and so on. Users will have the opportunity to build additional wiki-style pages, determining what content to include and who gets to contribute, Edwards says. Birdwatchers could flock together to post sighting records, for example, while molecular biologists might add gene expression data.

Researchers praise the EOL's vision but fret about the execution. "The exercise is only worthwhile if it's more accurate and better coordinated than what's already available on the Internet," says Frank Bisby, a taxonomist at the University of Reading in the U.K. and co-director of the Catalogue of Life. Even getting the names right for the poorly studied groups that contain much of biodiversity is a challenge, says Joel Cracraft, curator of ornithology at the American Museum of Natural History in New York City.

Obtaining permission to use post-1923 literature is also an issue, says Donat Agosti, an American Museum of Natural History entomologist who works in Bern, Switzerland. Edwards says that EOL is negotiating with scientific societies and publishers. Although some deals are in the offing, none has yet been announced, he says.

—MITCH LESLIE