the graphs to move the story. It is, he says, just as predicted by his wise former professor Roger Revelle (*8*). Then, in a denouement worthy of a detective novel, he shows that the temperature record over 600,000 years matched the record of CO_2 concentration over the same period. "Aha!" concludes the viewer. CO_2 is exposed as the cause of the deadly hurricanes, the spreading disease vectors, and the vanishing landscapes. Gore leaves the viewer with the mistaken impression that CO_2 is the driver of climate change in that historic record. Nonetheless, it is true that climate models including the CO_2 concentration as a coupled feedback provide excellent retrospective fits, and it is reasonable to accept the models' prediction that a CO_2 concentration several times greater than recorded in that record will result in temperatures similarly off scale.

Gore identifies CO_2 as the cause, though not the culprit. Gore creates flesh-and-blood heroes and villains. Revelle is presented as a modern day Paul Revere sounding the alarm. For villains, Gore invokes comparisons with the tobacco companies, who by sowing doubt about the epidemiology of smoking caused the deaths of many people (*9*), including Gore's beloved sister. Similarly, he says, those who would ruin our planet are sowing doubt about climate change. The film and book present a compelling story reminiscent of Rachel Carson's *Silent Spring* (*10*), which by dramatizing science changed public perception and policy.

Using the conceptually simple "wedge model" of Robert Socolow and Stephen Pacala (*11*), Gore suggests that a half-dozen approaches to energy efficiency, alternative energy generation, and carbon capture could collectively pull our planet back from the brink of runaway climate change. The responses he calls for are not so much advanced technology as immediate, extensive, even bold, applications of methods currently available for reducing carbon in the energy mix: stop energy waste, choose efficient transportation, insulate buildings, use renewable energy, and capture and store CO_2. Gore has since gone on to propose an immediate freeze on new emissions, taxes on carbon emitters, a ban on incandescent lights, increased fuel efficiency requirements for American cars, and a mortgage association to help homeowners save energy (*12*). He tells the viewers that they are now part of the story. He intends to leave his audience with a sense of responsibility and empowerment, not despair.

Through *An Inconvenient Truth*, Gore has personalized the climate change debate and made it accessible in a way that has not only reversed public apathy but also motivated citizens to seek real policy changes. It is a lesson for all of us who believe science can serve public policy, giving us a clear understanding of how to engage people in a debate.

References and Notes

1. See for example, National Research Council, *Carbon Dioxide and Climate: A Scientific Assessment* (National Academy Press, Washington, DC, 1979).
2. J. T. Houghton, G. J. Jenkins, J.J. Ephraums, Eds., *Climate Change: The IPCC Scientific Assessment* (Cambridge Univ. Press, Cambridge, 1990).
3. www.aaas.org/news/press_room/climate_change/mtg_200702/.
4. www.agu.org/sci_soc/policy/climate_change_position.html.
5. www.ametsoc.org/POLICY/2007climatechange.html.
6. J. T. Houghton *et al.*, Eds., *Climate Change: The Scientific Basis* (Cambridge Univ. Press, Cambridge, 2001).
7. J. M. Broder, M. Connelly, *New York Times*, 27 April 2007, p. A20.
8. R. Revelle, H. Suess, *Tellus* **9**, 18 1957).
9. D. Kessler, *A Question of Intent: A Great American Battle with a Deadly Industry* (Public Affairs, New York, 2001).
10. R. Carson, *Silent Spring* (Houghton Mifflin, Boston, 1962).
11. S. Pacala, R. Socolow, *Science* **305**, 968 (2004).
12. F. Barringer, A. C. Revkin, *New York Times*, 22 March 2007, p. A18.

10.1126/science.1142810

WOMEN IN SCIENCE

Can Evidence Inform the Debate?

Marcia C. Linn

Almost everyone has an opinion about the relative dearth of women in science. *Why Aren't More Women in Science?* offers evidence to enrich, strengthen, question, or even refute commonly held views. The 15 essays bring to life recent findings on the involvement of women and men in science courses and careers. Editors Stephen Ceci and Wendy Williams, developmental psychologists at Cornell University, enticed 19 leading researchers on gender differences in ability to contribute succinct, informative essays summarizing their studies. The contributors present their strongest arguments, support those with their best data, and articulate their beliefs about the current participation of women in science. I encourage readers to note their views about the issue, read the essays, reflect on their own beliefs, and then take advantage of the editors' cogent introduction and thoughtful conclusions.

Why Aren't More Women in Science?
Top Researchers Debate the Evidence

Stephen J. Ceci and Wendy M. Williams, Eds.

American Psychological Association, Washington, DC, 2007. 274 pp. $59.95. ISBN 9781591474852.

My main quibbles with the book are the focus on exceptional scientific attainments (Ph.D. level) and the emphasis on small differences between males and females. Although important, these discussions overshadow the stunning increases in participation of women in science and may reinforce stereotypes that affect selection and career decisions.

In recent decades, the participation in science of women relative to men has increased dramatically. For example, in her essay Janet Hyde reports that, in 1966, women earned only 4.5% of the U.S. doctoral degrees in physical sciences but by 2000 this percentage had risen to 24.6%. For the biological sciences, women earned 12% of the doctoral degrees in 1966 and 42% in 2000. Similarly, Diane Halpern reports that in the biological sciences (including medicine, from which women were actively excluded not very long ago) the participation of men and women in Ph.D. and medical programs is now approximately equal. However, as Virginia Valian notes, women progress through the ranks less rapidly and get fewer of the most prestigious jobs and promotions after completing their final degree.

Against this encouraging backdrop of women's increasing participation in science, the essayists focus on three main areas of scholarship. They largely agree that subtle beliefs about who can participate in science—held both by those who instruct and select participants and by those who decide whether to participate—affect participation and persistence. They offer disparate interpretations of well-documented findings about cognitive abilities that might contribute to success in science, as indicated by mathematics test scores and spatial reasoning scores. They discuss the emerging methodologies and findings about a wide range of biological indicators, including prenatal hormones, brain development, brain lateralization, evolutionary processes, and brain activation patterns measured while individuals engage in science-related tasks.

Many essays showcase the role of subtle beliefs in decisions concerning the participation of men and women in science. A series of studies of selection decisions illustrates these phenomena. These studies provided respondents with a portfolio, a job application, an

The reviewer is at the Education in Mathematics, Science, and Technology Program, Graduate School of Education, University of California, Berkeley, 4611 Tolman Hall, Berkeley, CA 94720–1670, USA. E-mail: mclinn@berkeley.edu

BROWSING

AirCraft. The Jet as Art. Jeffrey Milstein. Abrams, New York, 2007. 104 pp. $29.95, C$35.95, £15.95. ISBN 9780810992856.
Photographer Milstein presents 60 precise digital images of current long-distance and regional airliners, air freighters, and corporate jets. Most of the photographs were taken looking directly up from the end of the runway at planes about to touch down. All are printed without any background, to emphasize the planes' engineering details and graphic designs. Many of the jets bear standard, if sometimes striking, airline paint schemes. Others display customized treatments—such as these Boeing 737-700s that Southwest Airlines patterned after state flags.

individual essay, or other information that was attributed to a male or a female. Whether the task is to admit someone to a graduate program, to select someone for tenure, or to assign a grade to an essay, the studies demonstrate that documents associated with a male name consistently get a higher rating than the same documents associated with a female name. For example, Elizabeth Spelke and Ariel Grace report on a study of a tenure decision for a candidate with an average record. When the dossier was associated with a male name, 70% of the reviewers recommended tenure; when it was attributed to a female name, only 45% recommended tenure. In their separate chapters, Carol Dweck and Jacquelynne Eccles discuss how subtle beliefs about who should participate in science affect admission, hiring, promotion, and funding decisions as well as career choices.

Several of the essays consider performance on competitive mathematics tests, such as the Scholastic Aptitude Test (SAT) and the Trends in International Mathematics and Science Study, often offering rather divergent interpretations of such evidence. Mean differences in performance of men and women on mathematics assessments have narrowed over the years, which leads Hyde to argue for gender similarities rather than differences. Many authors focus on the performance of males and females at the extremes of the distribution, where the gap is large but again narrowing. The chapter by David Lubinski and Camilla Benbow is one of several that mentions the 1980s talent search by Benbow and Julian Stanley, in which they recruited students under 14 to take the SAT and found that for scores over 700 (two standard deviations above the mean), the ratio was 13 boys to 1 girl. By 1997, the ratio had dropped to about 4 to 1 (*1*); it has recently fallen further to 2.8 to 1 (*2*). These large differences motivate some contributors to criticize others for ignoring the evidence for males' superior abilities in science. In the most dramatic statement, Doreen Kimura argues that giving special scholarships or grants exclusively to women "bribes them to enter fields they may neither excel in nor enjoy."

A number of essayists provide very provocative findings about sex differences in the level of prenatal hormones, brain architecture, and brain activity patterns—factors that may play roles in determining people's aptitudes and interests in science. These studies are, of necessity, conducted with relatively small samples and often reach conflicting conclusions. For example, Ruben Gur and Raquel Gur draw attention to the rapidly developing techniques and methodologies in neuroscience and conclude that "biology can only offer a limited perspective."

Through their efforts, Williams, Ceci, and the contributors offer readers the opportunity to explore important issues in the ongoing debates surrounding the participation and persistence of women in science. The volume provides thoughtful and lucid viewpoints from essayists who disagree with each other and differ in their interpretations of the same evidence. It also draws attention to neglected variables that may affect gender differences in science, such as the hours per week that individuals report in pursuing their careers and trade-offs between financial and intellectual rewards in career decision-making.

Despite the disagreements among the contributors, they all concur that scientific talent is desperately needed to address the challenges facing us. They express in delightful, thoughtful, and encouraging ways their commitment to the goal of attracting able and interested individuals to science. At the same time, they endorse research on the full range of factors that might contribute to success in science. *Why Aren't More Women in Science?* raises important questions. The volume will stimulate all readers to think more deeply about their own beliefs, commitments, and activities as they consider participation in science and how we can ensure that all individuals have the opportunities they deserve.

Increased participation. In 1997, the AAAS Board of Directors included (left to right) physicist and electrical engineer Mildred S. Dresselhaus (president-elect), microbiologist Rita R. Colwell (chair), and ecologist Jane Lubchenco (president).

References

1. J. C. Stanley, *Johns Hopkins Mag.* **49**(4), 6 (September 1997); www.jhu.edu/~jhumag/0997web/letters.html.
2. R. Monastersky, *Chron. High. Educ.* **51**(26), A1 (4 March 2005); http://chronicle.com/free/v51/i26/26a00102.htm.

10.1126/science.1141569