of professional 'contrarian sceptics' have been ideological, shrill and way out of step with mainstream science. This historian got it right, both in the past and where the issue is going. I only wish that more of today's journalists and politicians were so careful and insightful.

It is the unwritten duty of a book reviewer to complain about something. So let me do it with full narcissism. In citing my first atmospheric-science paper in 1971, which suggested that aerosol cooling could dominate greenhouse-gas warming, Weart says that the "equations and data were rudimentary, and critics swiftly pointed out crippling flaws". He is right about the crippling flaws, but what I am most proud of was pointing most of them out first myself in a 1975 paper and in my book written with Lynne Mesirow, *The Genesis Strategy* (Plenum, 1976). Weart does note a 1992 chapter in which I predicted that an unambiguous greenhouse climate signal would emerge from the climatic noise around the end of the century, but I had first made this point in *The Genesis Strategy*. Given the IPCC's comments about the "discernible" impact of humans on climate in 1995, I am pretty proud of my 1976 crystal-ball gazing.

But these few personal complaints are trifles. This is a terrific book. For example, despite the polemics today from those who point to uncertainties in climate science as an excuse for inaction, when the usual proposed actions such as carbon taxes would hurt their ideological or clients' interests, Weart recognizes that science operates that way: "Scientists rarely label a proposed answer to a scientific question as 'true' or 'false', but rather consider how likely it is to be true. Normally a new body of data will shift opinion only in part, making the idea seem a bit more or less likely."

This is a clear statement of the bayesian or subjective probabilistic framework that is becoming the standard for complex assessments of problems such as climate change. I only wish more of my own colleagues were as epistemologically sophisticated about uncertainties and subjective probabilities as this historian (see *Nature* **418,** 476–478; 2002).

Perhaps the finest compliment I could give this book is to report that I intend to use it instead of my own book *Coevolution of Climate and Life* (Sierra Club Press, 1984) for my climate class. *The Discovery of Global Warming* is more up-to-date, better balanced historically, beautifully written and, not least important, short and to the point. I think the IPCC needs to enlist a few good historians like Weart for its next assessment. ■

Stephen H. Schneider is in the Department of Biological Sciences and co-directs the Center for Environmental Science and Policy, Stanford University, Stanford, California 94305-5020, USA.

Role model: physicist Ayse Erzan won the 2003 L'Oréal-UNESCO For Women in Science award.

M. PELLETIER/CORBIS

The parenting gap

Women in Science: Career Processes and Outcomes
by Y. Xie & Kimberlee A. Shauman
Harvard University Press: 2003. 336 pp. $59.95, £38.95

Abigail J. Stewart and Danielle LaVaque-Manty

Do young women take fewer mathematics and science courses in high school than young men, leaving them less prepared and therefore less likely to major in science and engineering fields in college? Is a woman with a bachelor's degree in science and engineering more likely to have begun her college career as a science major, or on a non-science track? This book, ten years in the making, offers definitive and surprising answers to these and other long-standing questions about women in science.

Using an inventive approach to deal with the paucity of data, Yu Xie and Kimberlee Shauman examine the question of women's under-representation in science by combining a 'life-course perspective' with the statistical analysis of 17 nationally representative data sets.

The life-course perspective assumes that major transitions in people's lives are "age-dependent, interrelated, and contingent on (but not determined by) earlier experiences and societal forces". By contrast, the more familiar conceptualization of career trajectories in science and engineering is a "science pipeline". This pipeline is unidirectional: participants enter the pipeline by taking maths and science courses at school, and leak from it at various points when they stop pursuing coursework or careers in science. And it is one-dimensional, regarding women's relationship to science in isolation from everything else.

The analysis of multiple data sets allows the authors to construct 'synthetic cohorts' of women, or 'hypothetical cohorts whose life history is constructed from real cohorts', whose career processes can be compared to those of synthetic cohorts of male counterparts. The composite portrait generated should reasonably represent the lifetime career trajectories of the population of women in science.

The care that the authors take with their empirical approach allows them to offer definitive answers to important questions. They find that although young men are twice as likely as women to enter college with the intention of majoring in science or engineering, this is not explained by gender differences in high-school maths achievement or coursework. The gender gap in mathematics achievement is small and has been declining, and girls not only take as many maths and science courses as boys, but also get significantly better grades in them.

More surprisingly, Xie and Shauman find that the majority of men who get baccalaureate degrees in science or engineering pursue those degrees throughout their college years, whereas most of the women who graduate in these fields enter science and engineering during college after starting on non-science tracks. This discovery complicates the unidirectional image of the leaky pipeline.

Several chapters in the book point to the role that having children plays in women's career trajectories. Married women with children are most likely to leave science and engineering after completing a degree. They are also less likely to be employed, promoted or geographically mobile than either their

male counterparts or women, whether married or single, who do not have children. Thus, Xie and Shauman believe that the gender gap in parenting responsibilities is a barrier to women's progress in science careers.

They offer few policy recommendations, but at least one seems new. Given the likelihood that a woman who leaves college with a science or engineering degree began her studies in a non-science field, educators need to figure out how to make studying science more attractive to women who are currently majoring in something else. Recruitment at the undergraduate level may be at least as important as retention.

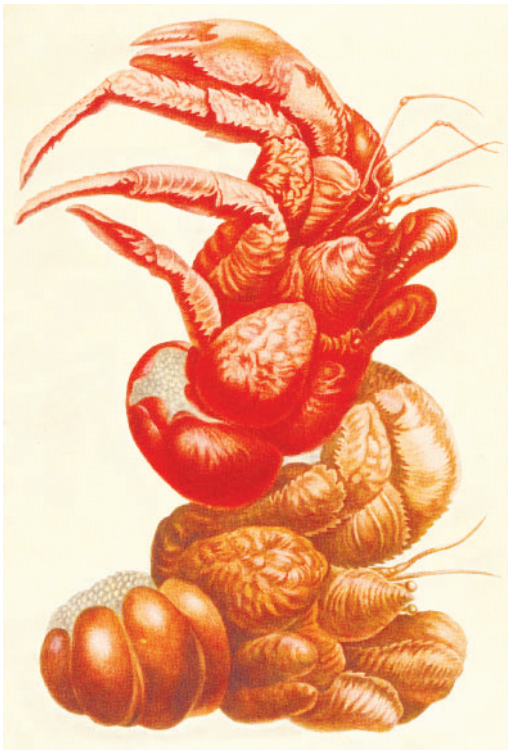
Xie and Shauman's findings also provide further evidence for the idea that employers should embrace policies that increase both flexibility (such as job-sharing and flexitime) and the availability of on-site childcare for working mothers.

It is important to note that the methodology that enables Xie and Shauman to provide us with definitive answers to some kinds of questions is a blunt instrument when it comes to others. For example, the authors are explicitly unable to address any possible school-level influences on young women's career plans, and cannot distinguish between physics, which currently attracts few women, and the biological sciences, in which women earn as many or more degrees than men. Nor can they offer insight into questions of institutional climate and practice and their effects, including effects on post-undergraduate leakage from science.

This is not to disparage the book for what it does not do — Xie and Shauman's careful research answers hard questions that have, in the past, seemed virtually unanswerable — but simply to note the limitations inherent in using the kind of data available to them. Their work should serve as a stimulus to further research applying equally careful and creative approaches to the many questions that remain. ■

Abigail J. Stewart is in the Department of Psychology and the Program in Women's Studies, and Danielle LaVaque-Manty is at the Institute for Research on Women and Gender, University of Michigan, Ann Arbor, Michigan 48109-1109, USA.

Wildlife in watercolours



The German artist and natural historian Maria Sibylla Merian (1647–1717) was a remarkable woman who, as a single mother, earned her living as an artist and travelled to South America in search of new specimens to paint. She came from a family of artists — her father was an engraver, and both her stepfather and her husband were painters.

Maria had a keen eye for nature and as a child kept silkworms so that she could record their development in her paintings of flowers and insects.

She published many books of her own, although the painting of coconut crabs shown here was one of the illustrations she made for Georg Eberhard Rumpf's book *D'Amboinsche Rariteitkammer*.

Many of Maria's original paintings were purchased by Tsar Peter the Great for his art museum in St Petersburg, Russia. They are now available to a wider audience in *Maria Sibylla Merian: The St Petersburg Watercolours* (Prestel, £55). **Mary Purton**

The descent of man

Adam's Curse: A Future Without Men
by Bryan Sykes
Bantam Press: 2003. 300 pp. £18.99

Jennifer A. Marshall Graves

I think 2003 must have been the Year of the Sex Chromosomes. On the heels of Steve Jones' *Y* and David Bainbridge's *The X in Sex* (both reviewed in *Nature* **423,** 223; 2003) comes *Adam's Curse: A Future Without Men* (note the absence of a question mark).

After reading Bryan Sykes' delightful article on the history of the Sykes Y chromosome (*Am. J. Hum. Genet.* **66,** 1417–1419; 2000) and his successful book *The Seven Daughters of Eve* (Norton, 2001), I looked forward to this book. I admire authors who can interest non-scientists in genetics — a vital skill if we are to cultivate an informed public to debate the manipulation of sex and reproduction.

Indeed, the book is fun to read — the writing style is lively, the images fresh and witty, the explanations of basic genetic principles apt and accurate, even inspired. Like *Y*, *Adam's Curse* centres on sexual conflict, here the war between the mother's mitochondrial genome and the father's Y chromosome. Sykes traces the spread of the Y chromosome in space and time, enriching the account with the history of Vikings, Polynesians and Genghis Khan.

The author's focus on his own family is a good device to explain how the Y chromosome gets around and to introduce the history of families and surnames, migrations and conquests. But the focus on Sykes and his family, Sykes' blood cells and the Sykes Y chromosome, then Sykes' ideas and finally Sykes' wild speculations, rather gives the impression that the entire field was explored single-handedly by Bryan Sykes, genetic supersleuth.

Of particular interest to me were the dire predictions of the imminent decay of the Y chromosome. Sykes calculates from the frequency of Y mutations in men (can it really be high as 2%?) that the fertility of the whole human population will plummet within 125,000 years (upping the ante on my calculation of 9 million years). But does the disappearance of the Y chromosome, as Sykes avers, really mean the extinction of humankind unless we can dispense with the imprinting of at least 100 genes and embrace parthenogenesis? I don't see why. After all, several spermatogenesis genes, and even *SRY*, have already been dumped in other species with no ill effect.

Indeed, the book abounds with bold assertions hedged by "I can't prove it but…". Families that produce more boys than girls (the Sykes clan again, documented by dusty records from a village school) expose a superselfish Y chromosome. Newspaper accounts of female-only families are proof of toxic, Y-hating, superselfish mitochondria. Even the 'gay gene' turns out to be a mitochondrial plot.

I welcome speculation in popular-science books. Sharing with the public the leaps of imagination that make science exciting and creative might banish its image as gadget-driven and boffin-dominated. But speculation on speculation becomes tedious, and ultimately I feel that the central argument degenerates under its weight — like the Y chromosome itself. ■

Jennifer A. Marshall Graves is in the Research School of Biological Sciences, Australian National University, Canberra, ACT 2601, Australia.