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Nasir al-Din al-Tusi's early work on planetary orbits may have later inspired Nicolaus Copernicus.

al-Haytham's work had a profound influence on Roger Bacon, the Arabic-speaking Oxford scholar who was a protégé of the pupils of the Spanish Moors; Bacon quotes al-Haytham throughout his *Opus Majus*. It was not until the seventeenth century that a different historical figure, Francis Bacon, would champion the modern scientific method as part of the scientific revolution.

Masood asserts that the eighth-century chemist Jabir ibn Hayyan produced texts rich with laboratory techniques and experimental methods that are familiar in modern-day chemistry. Jabir came up with a framework for classifying materials and devised an array of chemical processes including sublimation, liquefaction, crystallization and distillation, and discovered both alkalis and strong acids such as sulphuric and hydrochloric acid. Subsequently, al-Razi (also known as Rhazes) built on Jabir's work and surpassed him; his practical work reinforced the need for proof by experimentation, enabling him to contribute to the development of pharmacology.

Among other European scholars who Masood explains were profoundly influenced and inspired by Muslim polymaths were Leonardo da Vinci and Johannes Kepler. Masood highlights some of the discoveries, scientific instruments and inventions made by Muslim scholars in the realms of medicine, surgery, chemistry, physics and astronomy.

A science journalist and editor at *Nature*, Masood manages to address the subject in a refreshingly non-partisan fashion, presenting a spectrum of arguments from the most relevant academics and historians. He is bold enough to present counter-arguments from adversarial sources, to the extent that he seems polemical. The result is a successful compilation of a complex and contentious history that is conveyed with simplicity. Because *Science and Islam* is aimed at a popular audience, many intricate details are missing. Yet it is the first concise book on the topic suitable for the non-expert.

Both books are opportune and contribute to the long-overdue popularization of the multicultural history of science. No doubt a flurry of similar books will shortly appear, especially given the current political climate coupled with the underpinning role that science has in modern society and the possibilities for development it offers in reviving the Middle East. Yet what is still needed is an updated popular historiography that can span the full breadth of world history and position the outputs of Islamic science into a wider context. That is worth waiting for. ■

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Myth of the missing mothers

Motherhood, the Elephant in the Laboratory
Edited by Emily Monosson
Cornell Univ. Press: 2008.
232 pp. $25, £13.95

Confront a scientist with data and they will suggest a hypothesis to explain them. When confronted with the dearth of women in the scientific profession, scientists often try to connect gender — female — with a physiological reason for absence — motherhood. Family, they say, must be the reason that there are so few women in the sciences, as the years when women start families coincide with those when young scientists are building academic careers.

This hypothesis does contain a kernel of truth: the academic profession, which evolved from medieval monasteries, was not designed with a dual-career family in mind. The modern workplace is still evolving, far too slowly, towards a gender-equal world, where both parents have busy lives and both can pursue their scientific passions.

Motivated by her own struggles to balance motherhood and work, toxicologist Emily Monosson collects in *Motherhood, the Elephant in the Laboratory* the parenting experiences of nearly three dozen mothers and scientists, two of whom are her daughters. She groups these viewpoints by era, starting with women who came of age scientifically in the 1970s and going up to the present day. One sees the gradual changes that have resulted from, and helped to support, a steadily increasing presence of women in science.

But progress is not steady enough. Those of us who raised families in the 1990s pushed to replace 'disability leave' with proper 'maternity leave' and to create rooms where mothers could express breast milk. We tried to get on-site day care, although we were rarely successful. We thought these accommodations were a good start and a done deal. Yet, as the disturbing stories of women who got their PhDs in the past decade make clear, university women still confront ignorance and inflexibility. Many practices that should have vanished — lack of maternity leave or the inability of employers to cope with pregnant employees — are still with us.

> "It is harder to raise a family as a supermarket employee than as a professor of physics."

Evolutionary biologist Gina Wesley-Hunt (PhD 2003), tells us she "was fired for getting pregnant". Katherine Douglass, a physician and Monosson's daughter, describes the difficulty of finding a romantic partner who would view her as an equal. A young nursing mother, Deborah Duffy (PhD, Psychology, 2001), recalls an all-day interview for a faculty position without the requested breaks for pumping breast milk. "As I sat there doing my best impression of a dairy cow," she writes, "I recall thinking, 'What a bizarre experience.'" My fervent hope is that the experiences described in *Motherhood* become less bizarre — not because female science professors do not have children but because they do, thus helping their colleagues become familiar with the process.

Monosson's book sets out the variety of paths possible for scientist mothers, but it contains few stories about women who have successfully combined traditional careers as science professors with traditional families. I know many such women. I am one, as is Stefi Baum — astronomy professor, mother of four, an old friend and a contributor to the book. It is unfortunate if young women approach their futures convinced that they have to make radical compromises to combine family and

science. The more young women who push forwards assuming, as young men routinely assume, that it is possible to 'have it all', the sooner that will be possible for everyone. It would be a shame if, after reading this book, young women got the opposite message.

More disturbing is the implication that in the absence of motherhood, women in academic science would have untroubled careers. This is naive. Evidence shows that female scientists without children do not fare better than those with children who remain full-time in the workforce. Neither advance as steadily as their male counterparts, with or without children. Some explanation other than family must be the reason for the slow advancement of women.

Furthermore, countries with enviable support systems for parental leave and childcare — of the kind rightly advocated by Monosson — have astonishingly low participation of women in science. For example, in Denmark, only around 10% of full professors of science, and 2% of physics professors, are women. The numbers are higher in the United States, even with its less generous childcare policies. Neither does physiology and family explain why the fraction of scientists who are women varies widely from one country to another, even when social support systems are similar; the percentage of female scientists is much higher in France and Italy than in the United Kingdom or Germany, for example. Women's participation in science also varies widely from field to field: more than 50% of graduating MDs in US medical schools are women, whereas in physics and engineering, less than 20% of PhDs go to women.

Outside our universities, many women with young children have full-time jobs — 70% in the United States — and few of those jobs are as flexible or as well paid as jobs in academic science. There is no question that it is harder to raise a family as a supermarket employee than as a professor of physics, so why do academics seize on family as the explanation for the absence of women? The dominant obstacles to women in science — persistent, unexamined bias and lack of mentoring — are described clearly in *Beyond Bias and Barriers* (National Academies Press, 2007) and in *Academeology*, by the pseudonymous blogger Female Science Professor (LuLu, 2008; see *Nature* **456,** 445; 2008). Young women trying to figure out the road to success in science might be better served reading those books rather than *Motherhood*. ■

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Each year, forests release 30% more carbon than is emitted by fossil-fuel burning.

G. LUDWIG/PANOS

Storing carbon in forests

Climate Change and Forests: Emerging Policy and Market Opportunities
Edited by Charlotte Streck, Robert O'Sullivan, Toby Janson-Smith and Richard G. Tarasofsky
Chatham House: 2008. 360 pp. £39.99

Planting, conserving and managing forests are key for attaining long-term mitigation of greenhouse gases, yet the land-use and forestry sector barely features in the Kyoto Protocol. In *Climate Change and Forests*, some 50 experts analyse the forestry-based discussions within climate-change negotiations, and offer technical and political reasons for why the Kyoto Protocol handles forestry in such a cumbersome way.

The authors argue that in the run-up to the 1997 Kyoto conference, the forestry sector's complexities were ignored in negotiations because knowledge about using forests as carbon sinks was limited at the time. This failure to resolve the contributions of forests has meant that rules formulated since then are not conducive to improving the ability of forests to sequester large amounts of additional carbon. The book provides an excellent historical background and describes the process and logic of negotiations, past and present. The multiple analyses of technical problems associated with carbon sequestration and forests make it valuable to both newcomers and veterans in the field.

Case studies demonstrate that the right incentives or policies to change land usage must vary between countries. In developing nations, for example, legal owners of land where carbon sinks could be enhanced are often absent or difficult to identify. Without knowing which people and actions are genuine candidates for carbon-incentive payments, the market-based instruments that help administer these incentives risk losing their efficiency. Experimentation is necessary and may involve many failures before success is achieved.

Although this collection includes many voices, most belong to a single camp that favours market-based instruments for encouraging changes in land use towards carbon storage. This fails to reflect the diversity of opinion in global discussions, and the book would have benefited from the inclusion of some critics. Also missing is evidence for why market-based instruments are superior to other policy interventions. The authors mention the preconditions for markets to work — property rights, legal and regulatory frameworks — but give only vague arguments for how policies could be engineered to support the use of forests in storing more carbon on meaningful scales.

The greatest opportunities for forest-based mitigation of carbon emissions are in the developing world, and the most efficient window in which to stop deforestation is between now and 2030. However, the book fails to address how carbon markets in developing countries, such as the Democratic Republic of the Congo, could be made to operate on a large scale in an institutional vacuum. It is unclear which sources will generate the tens of billions of dollars per year that are needed, for example, to reduce deforestation by half in the coming decades. The funding issue is exacerbated by the current financial crisis that emerged after the book was written.

Climate Change and Forests emphasizes the difficulty of sequestering carbon in forests, given their vulnerability to disturbances that re-emit carbon, such as forest fires. But the book neglects issues of climate adaptation. Forests will take centuries to adapt to the disruptive processes that accompany climate change, making forest carbon stores vulnerable in the long term.

More carbon is locked in forests than in the atmosphere, and the yearly carbon flux attributed to natural disturbances is 30% higher than current emissions of fossil fuels. Under the United Nations Framework Convention on Climate Change, a multibillion-dollar fund to support climate-adaptation measures is being set up. I hope the authors are planning a new book to analyse how the mechanisms around this fund will interact with and strengthen forest-mitigation instruments in the post-Kyoto era. Like *Climate Change and Forests*, this second volume would be a crucial reference for academics, negotiators and policy-makers, and for the forest business community. ■

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