The book best succeeds in providing a very brief survey of the multitude of positions occupied by thinkers in this area. The lack of agreement on any issue, such as whether there really is a hard problem — or if there is, what it is — is striking. Some theorists think that the problem is really hard. Even when we understand how the brain accomplishes its astounding variety of complex tasks, such as visual recognition, memory, planning and so on (the 'easy problems' of consciousness), something will be left unexplained: how or why these intelligent behaviours are accompanied in us by conscious states. Those who believe in the hard problem generally believe in the possibility of 'zombies' — beings who function exactly as we do, yet lack the mysterious spark of consciousness, so "all is dark inside". Others think the hard problem isn't really that hard, and that the problem of subjectivity will dissolve once we have a handle on the easy problems. Still others claim that the problem itself is illusory.

Because of the extremely light hand Blackmore takes in editing, the often quirky personalities and mannerisms of the interviewees shine through the text. The effect is magnified when you know the people: I could hear, for instance, Ned Block's enthusiastic voice and Crick's wry quips about philosophers in my mind's ear. This gives the book some added appeal: readers really get a sense of 'what it is like' to talk to these people. A few of the interviews with people I've never met made me wish I had a chance to explore their views further over dinner and a good bottle of wine, but others left me cold. Blackmore herself comes across as spunky and clever, and the probing follow-up questions she occasionally asks prevent the interviews from seeming too repetitive and boring.

However, if you are serious about meeting an intellectual soulmate in the quest to understand consciousness, speed dating may not be for you. The book is rather unsatisfying for anyone with a deep interest in the issues, for no position is articulated clearly enough for readers to see the depth of the problems or the breadth of knowledge (or ignorance) that characterizes our current understanding of issues related to consciousness. Despite Blackmore's obvious intelligence and familiarity with the issues, at crucial points she does not press her interviewees hard enough or deeply enough to provide us with truly novel insights.

Conversations on Consciousness provides an introduction to a variety of positions, but is too cursory to make possible their evaluation. For that, one would need to spend a few evenings alone with the works of one or another of the thinkers. Like speed dating, *Conversations on Consciousness* is low-risk, but ultimately also low-payoff. It is, at best, a good way to guide an interested novice into the field. Second date, anyone? ■

Adina Roskies is in the Department of Philosophy, Dartmouth College, Hanover, New Hampshire 03755, USA.

S. BIANCHETTI/CORBIS

IMAGE UNAVAILABLE FOR COPYRIGHT REASONS

IMAGE UNAVAILABLE FOR COPYRIGHT REASONS

BETTMANN/CORBIS

Flame and fortune? Antoine Laurent Lavoisier (left) beat Joseph Priestley to the discovery of oxygen.

Burning ambition

A World on Fire: A Heretic, an Aristocrat, and the Race to Discover Oxygen
by Joe Jackson
Viking: 2005. 384 pp. $27.95, £17.99

Bernadette Bensaude-Vincent

One of the most famous episodes in the history of chemistry is the race for priority between the two rival champions of oxygen, Joseph Priestley and Antoine Laurent Lavoisier. Priestley was a Unitarian minister who divided his life between laboratory experiments and theology, and was forced to move from England to exile in the United States. Lavoisier was a young, ambitious and wealthy academician who never left France and met a tragic end in 1794, when he was guillotined by French revolutionaries. Joe Jackson plays nicely on the contrast between the two men in his extremely readable book *A World on Fire*. The title refers both to the role of oxygen in combustion, first established by Lavoisier, and to the context of scientific competition and political upheaval.

Jackson tells the story in the manner of a standard historical narrative, in chronological order, occasionally interrupted by glimpses of the broader cultural and political context. However, some of these interludes, such as the chapter on the guillotine, which speculates on how long its victims had to suffer before they died, do not seem particularly relevant. If the goal of the book was to weave together science and politics, it is not fully achieved. And this is not just because of the spelling mistakes and incorrect dates (for example, Descartes's *Discourse on Method* was published in 1637, not 1677).

The narrative fails to adequately recreate the scientific milieu of the late Enlightenment in Britain and France. Jackson consulted Priestley's archives, but he did not rely on primary sources for the French part of the story. He didn't even get his information from the recent wealth of scholarly publications on the chemical revolution. For instance, Frederic L. Holmes' *Antoine Lavoisier: The Next Crucial Year* (Princeton University Press, 1998) would have been a useful source for describing the pathway to the discovery of oxygen, especially as it is based on a close examination of Lavoisier's laboratory notebooks of the year 1773. As a result, Jackson's book reinforces some old clichés, such as the view of Lavoisier's career as a systematic development of a seminal idea, a revolutionary plan meant to overthrow Georg Stahl's phlogiston theory.

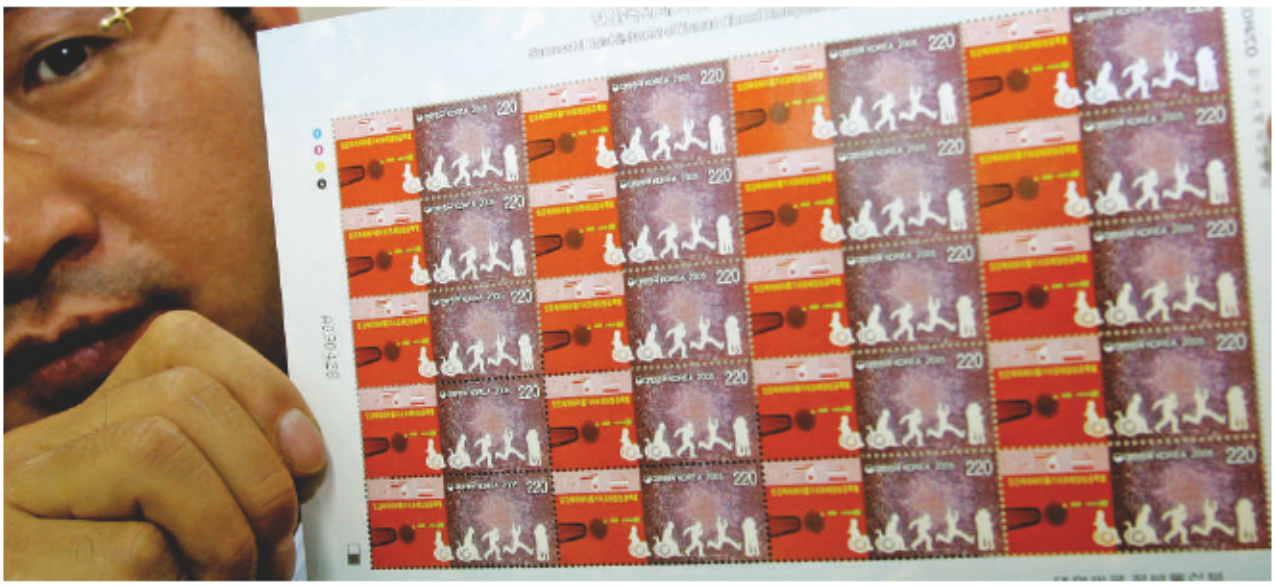
More importantly, Jackson's early chapters suggest that pre-lavoisierian chemistry was an inconsistent, empirical science, clinging to the ancient doctrine of the four elements. In truth, historians of eighteenth-century chemistry describe a booming field, based on more robust notions: not only had the four elements been redefined in terms of simple substances and agents or instruments, but laboratory practices were guided by tables of affinities.

The narrative itself suffers a major bias, being written from a present-day perspective. Because Jackson knows that the 'dephlogisticated air' that Priestley released from mercury calx was oxygen, he doesn't create any dramatic suspense. He assumes from the beginning that Priestley was wrong and Lavoisier was right. It would have been more interesting to show how the identity of oxygen was constructed through the confrontation between Priestley and Lavoisier. The contrast between Lavoisier's academic experiments, using sophisticated and expensive instruments, and Priestley's attachment to more democratic and qualitative practices, was described in a more balanced way by Jan Golinski in *Science as Public Culture* (Cambridge University Press, 1992). Jackson portrays Priestley as a complex and interesting character, but makes no effort to understand his strong convictions and religious beliefs. In contrast, the two-volume biography by Robert Schofield,

The Enlightenment of Joseph Priestley and *The Enlightened Joseph Priestley* (Pennsylvania State University Press, 1977 and 2005), provides a detailed account of Priestley's multiple facets.

Popular historical narratives should not be blamed for distorting scholars' historical accounts; after all, each historical narrative is a reconstruction of the past, even those based on a detailed analysis of primary sources. Popular historical accounts can convey a clear picture of the period and the characters, something achieved by the Open University video *The Publicity of Oxygen* (BBC, 1993). Some of them openly presented as fictions raise stimulating issues. This was the case with *Oxygen*, a play written by Carl Djerassi and Roald Hoffman that created a 'retro' Nobel to be awarded to the discoverer of oxygen. The discussions of the Nobel committee as it decides between Carl Wilhelm Scheele, Priestley and Lavoisier prompt reflection about the mechanisms of discovery attributions. Historical fiction like this may be more useful and more pleasant than inaccurate pseudo-realistic accounts. ■

Bernadette Bensaude-Vincent is in the Department of Philosophy, Université Paris X, 200 avenue de la république, 92001 Nanterre, France.



KIM KYUNG-HOON/REUTERS

SCIENCE IN CULTURE

Stamping his authority

The Hwang scandal highlights the dangers of hyping science.

Martin Kemp

The repercussions of the falsification of stem-cell research by Korean scientist Woo Suk Hwang will reverberate around the scientific community for years to come. And the public dimension seems just as momentous, especially when we consider the mechanisms that elevated this former veterinarian, who was famous only in his home country in 1999, to become one of *Time* magazine's people of the year in 2004.

Hwang's rise involved celebrity-minded scientists, state bodies in South Korea concerned with national prestige, funding agencies accountable to government masters, educational institutions bent on international competition, and journalists intent on good stories. They came together in a complex symbiosis to create a distorted image of scientific achievement.

Korea Post issued a postage stamp in Hwang's honour on 12 February 2005. Designed by Roh Jung-hwa, with a denomination of 220 won and printed in a quantity of 1.6 million, it was, the stamp tells us, specially issued to commemorate "the successful establishment of human cloned embryonic stem cells".

The previous stamp released by Korea Post had shown nature on the island of Marado, with images of happy fish in azure seas, and the next was dedicated to the centenary of Rotary International. A further stamp for 2005 marked the sixtieth anniversary of Korean liberation from Japanese rule, an event of sufficient moment for any national postal service to celebrate. Later in the year, fusion was the subject — not fusion of the scientific kind, but of global cultures, symbolized by a knife and fork being handled as if they were chopsticks. Such was the heady philatelic setting of Hwang's stamp.

The long rectangle of the stamp contains on the left the expected graphics of high-tech cellular science, including the tip of a needle about to break through the wall of a human egg. A man in a wheelchair, silhouetted against the red background, rises triumphantly across the stamp to the right. He runs and leaps for joy in front of a purple cellular sun, before throwing himself into a woman's eager embrace. In a country with a large Christian population, the image of the cripple rising to walk carries clear connotations.

The tone of the scientific imagery on the left of the stamp is similar to that of James Brooke's article in *The New York Times* on 31 May 2005. "In the shadows of a darkened laboratory, a technician in a blue jumpsuit prodded and probed the egg's outer membrane...seeking to introduce a skin cell from a patient with an immune deficiency.

"Finally, on the third probe, the rubbery wall gave way. Magnified 250 times on a black-and-white screen, the egg could be seen making room for the new skin cell, with its new genetic code."

The right part of the stamp encapsulates the claims made in *Time*'s profile: "Hwang and his team at Seoul National University became the first to clone human embryos capable of yielding viable stem cells that might one day cure countless diseases." The stamp's implicit claims for a panacea for debilitating illnesses is just one of a vast number that make their way into the media when stem-cell research and human genomics are discussed.

The question raised by the stamp and other such visual and verbal hype is whether it is now possible to become a big beast in the international jungle of science without becoming ensnared in the perilous mechanisms of celebrity.

Martin Kemp is professor of the history of art at the University of Oxford, Oxford OX1 1PT, UK.