1000-plus footnotes, the book is duly impressive. But numbers alone do not ensure correct conclusions. Edward Hooper, for example, included some 2288 footnotes in the 1104 pages of *The River* (*2*), but apparently still drew the wrong conclusions. Peter Duesberg's book (*3*) offers 872 footnotes in 736 pages, yet does not change the fact that HIV causes AIDS.

Science Fictions spends a great deal of time on what was supposedly said around and during the federal investigations that followed the *Chicago Tribune* article. But it spends precious little time digesting the ultimate conclusions of the legal process or considering what was different about the final legal step, which led to the exoneration of Popovic and Gallo. The appeals process of the Department of Health and Human Services invoked by Popovic offered—for the first time in all the years of investigation, hearings, testimony, newspaper articles, and accusations—the application of the rules of evidence and due process of law. Accusers were finally held accountable for what they said, evaluated for their qualifications, and required to prove their claims. The accused was able to question the accusers, who were required to testify under oath and in the light of cross examination—according to the basic protections of Anglo-American law. The case against Popovic disintegrated. A stinging, 79-page decision issued by the appeals panel not only found Popovic innocent of all charges, but it harshly criticized the fairness of the entire process to which he and Gallo had been subjected. A few days later, the remaining case against Gallo was dropped. Government prosecutors claimed and the author argues that this decision set a higher bar for proving scientific misconduct, but their objection makes little sense except as face-saving. Why should scientists be denied due process? Why allow them to be judged on the basis of hearsay, unsubstantiated claims and opinions, or the pronouncements of witnesses who lack knowledge of the relevant science?

In addition to this misrepresentation of the legal findings, major errors appear throughout the book. In this short review, it is impossible to delineate them. But the author would no doubt resent such a claim without substantiation, so I will let others speak on the matter. Montagnier, seen as the most aggrieved party in the book, has commented: "As a living actor of AIDS research since the early days, I regret to say that this is not a book I would recommend for anyone interested in medical history. I noticed many mistakes and fallacious statements in the description of the French contributions to HIV discoveries, which makes me think it is probably inaccurate on the American side as well..." (*4*).

It is difficult to understand the purpose of this book. Why would an obviously skilled writer indulge in such an over-the-top assault when a more even-handed approach might have provided a solid foundation for his case? Surely, Gallo was no saint in the early days of AIDS. He was often publicly arrogant and, like others at the time, probably couldn't fathom the idea that a small team of relatively unknown scientists in France was making major contributions. He was, he admits, "stuck" too long in the belief that the virus would be a member of the HTLV family. But there is no evidence that this delayed finding the truth. Who among us hasn't behaved foolishly in our youth, especially if swept up in sudden fame? None of these shortcomings make Gallo the unrepentant monster portrayed in *Science Fictions*.

In the end, what might have been an important book about AIDS research fell victim to the author's own passion and vendettas. Some of *Science Fictions* may be true, and there may be much we can learn from it. How might the bruising interplay of politics, ego, government patents, and nationalism demonstrated here help us do a better job when the next epidemic comes along? Likewise, perhaps there is an important case study here that could help set future standards of scientific etiquette. Still, the book's bias is profound and unmistakable, and bias is the antithesis of science. It is impossible to separate the book's wheat from its chaff. There appear to be no imaginable circumstances in which Crewdson would say, "I was wrong about these things." A full, accurate, and fair accounting can only come from a writer who has nothing riding on the outcome, someone whose own reputation and judgment are not entwined with the story.

References and Notes

1. J. Crewdson, "The Great AIDS Quest," *Chicago Tribune*, 19 November 1989, section 5, p. 1.
2. E. Hooper, *The River: A Journey to the Source of HIV and AIDS* (Little, Brown, New York, 1999).
3. P. Duesberg, *Inventing the AIDS Virus* (Regnery, Lanham, MD, 1996).
4. Montagnier's comment appears in a 6 March 2002 letter written in response to John Horgan's review of *Science Fictions* (*New York Times Book Review*, 3 March 2002, p. 9).

NOTA BENE: CHEMISTRY

Enticing and Informative Tales

The Genie in the Bottle
64 All New Commentaries on the Fascinating Chemistry of Everyday Life
by Joe Schwarcz

W. H. Freeman (Henry Holt), New York, 2001. 311 pp. $23.95. ISBN 0-7167-4601-8.

Chemistry has an image problem, and chemicals are now seen as a scourge of modern society. At best, people remember the smelly experiments from their high school days; at worst, they recall the latest explosion at a chemical plant or leak from a derailed train.

The problem has become severe enough that chemists' societies are now actively working to reverse it and to encourage more students to enter the field in order to meet the growing needs of industry. Joe Schwarcz, the director of the Office for Chemistry and Society at McGill University in Montreal, has been busy educating the public through newspaper articles and a weekly phone-in radio program. His new book, *The Genie in the Bottle*, is a sequel to his *Radar, Hula Hoops, and Playful Pigs* (Freeman, New York, 1999). In both books, he presents over 60 humorous vignettes that highlight aspects of chemistry encountered in everyday life, and he also debunks many scientific frauds perpetrated over the years. We learn about secret inks, the dangers of mixing drain cleaners, the Scoville Organoleptic Scale for rating spicy materials, and the use of a veterinary product as a beauty aid. He explains why some materials are sticky and, thus, how to make glue.

Schwarcz also covers many serious and timely topics, such as the fortuitous discoveries of the interactions between grapefruit, St. John's wort, and many prescription medications—an extremely important topic given the unregulated nature of the health supplement and herbal remedy industries. Perhaps the most notable of the stories he presents concerns thalidomide. Prescribed as a morning sickness treatment 45 years ago and subsequently shelved because it was found to cause severe developmental defects, this chemical is now back in the media spotlight because of its ability to block the formation of blood vessels. It might be useful in treating tumors as well as several other conditions. Though the emotional scars left by the drug's role in producing malformed babies still linger, the chemistry of thalidomide remains unchanged.

Chemistry and chemical interactions affect everyone on a daily basis, but we can influence how they do so. We can carefully choose the products we use in our homes and our diet and dietary supplements; we can use filters to screen out air and water pollutants; and much more. Schwarcz's two books (with more promised) demonstrate why a basic knowledge of chemistry is essential to each of us.

—MARC LAVINE