

Current Books

make mistakes," McDermott concludes at one point. "It made mistakes all the time. It didn't get caught because the government with which it was dealing made more of them." That analysis is certainly correct, but

it's the life stories McDermott recounts, rather than the conclusions he draws from them, that make *Perfect Soldiers* such a memorable book.

—DAVID J. GARROW

SCIENCE & TECHNOLOGY

THE XENO CHRONICLES: Two Years on the Frontier of Medicine Inside Harvard's Transplant Research Lab.

By G. Wayne Miller. PublicAffairs.
233 pp. \$26

In olden days, people whose organs failed simply died. Nowadays, they can get replacements from the newly deceased (heart, liver) or the exceptionally generous (kidney). But the organs available are vastly outnumbered by the organs needed. As of late 2004, some 87,000 people were on transplant waiting lists, and thousands of them will die still waiting. One solution seems obvious: organs from animals. It just hasn't worked yet.

The biggest problem in all transplantation is rejection, the immune system's attack on the new organ. In the early 1980s, researchers developed a drug, cyclosporine, that suppresses the immune system. Cyclosporine made human transplantation the relative success it is now, and made xenotransplantation—replacing human organs with animal organs—a real possibility.

The Xeno Chronicles tells the story behind one of the latest techniques in xenotransplantation. David Sachs, an immunologist at Harvard Medical School, genetically engineered miniature pigs to lack the sugar molecules that trigger organ rejection in humans. The pigs were cloned, bred, and eventually killed. In 2003, Sachs's team transplanted a kidney from one of the pigs into a baboon, along with the thymus gland, part of the pig's immune system that could educate the baboon's immune cells to accept the foreign organ. The process was repeated in a handful of other baboons. If it worked, a case could be made for clinical trials in humans.

But within a couple of months, every baboon with a pig kidney died. The cause wasn't always organ rejection; when Sachs's

technique outsmarted the baboon's immune system, as it sometimes seemed to do, something else went awry. The drug company backing Sachs eventually grew discouraged, and the National Institutes of Health, which ordinarily funds academic research, doesn't fund much xenotransplantation. So Sachs is more or less out of business and looking for money.

G. Wayne Miller, a *Providence Journal* reporter and the author of six previous books, focuses less on scientific failure than on the research enterprise itself. Besides the Harvard experiments, he writes about the people whose hearts or kidneys have given out, and the ethics of deciding who receives an organ and who doesn't. He details the history of transplantation: the Jazz Age quacks who transplanted monkey testicles into men worried about their sexual abilities; the experimental liver and heart transplants of the 1960s and 1970s, which never worked for long; the golden age of transplantation in the 1990s, when, thanks to cyclosporine, anything seemed possible; and the slow dimming of the promise thereafter. Miller discusses the difficult balance between animal rights and animal testing, and the scientists who care for and soothe, but can't bring themselves to name, the animals they're going to kill in hopes of saving human lives. And he profiles David Sachs, now in his sixties, who's had a superb career but hasn't managed to accomplish what he most wants.

Though surely necessary, all this contextual material isn't presented chronologically or logically; the result is less braid than spotty mosaic. Still, the writing is fluid and fun, and Miller sympathetically portrays a smart scientist who's never going to quit trying. "I can't believe we won't get there," Sachs says. "I just hope it doesn't take longer than I've got."

—ANN FINKBEINER