Book Reviews

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Cracking the Genome: Inside the Race to Unlock Human DNA. By Kevin Davies. New York: The Free Press. Pp. 310. $25.00

When I was an undergraduate working at the National Research Laboratories in Ottawa, I asked the local Nobelist, Gerhart Herzberg (Nobel Prize for Chemistry, 1972), if he could recommend a good book on the Manhattan Project. He did not work directly on the atomic bomb, but he knew many of the key scientists in their postwar careers. He couldn't recommend a specific book, but he told me to read many books on the same topic. He said the history of science was fraught with error, since it was usually not recorded until a Nobel Prize was awarded. By then, it was too late to get it right.

In his book *Cracking the Genome,* Kevin Davies doesn't wait that long and tells a version of biology's superproject just as the "draft" sequence of the human genome is being announced. Davies, well known to the American Society of Human Genetics as a founding editor of *Nature Genetics,* is qualified to write a behind-the-scenes account of the Human Genome Project (HGP). The book is not intended to be the definitive record of the HGP but aims to capture the excitement and majesty of the quest to crack the genetic code.

The story primarily focuses on HGP events of the last 3 years, from the initiation of the DNA-sequencing phase of the publicly funded effort, to the entry of Celera Genomics into the race. There is little discussion of the important scientific events preceding the sequencing stage. The obvious main characters, Francis Collins and Craig Venter, are portrayed as modern-day knights of good and not-so-good, respectively, tangled in a quest for biology's Holy Grail.

As in any good novel, character development is crucial. Venter is portrayed as the hypercompetitive scientist that he seems to be. Through his large-scale expressed-sequence tag sequencing, establishment of The Institute for Genomic Research, and sequencing of bacterial and *Drosophila* genomes, his actions become predictable. To know Venter, one only has to know Celera's corporate motto "Discovery can't wait." The development of Collins's character, however, does not give enough gritty detail to foreshadow how he might deal with Celera's direct assault on the HGP. Self-billed as the "field marshal" of "Team Sequence," Collins and the other HGP sequence leaders are essentially thrown into a boxing ring wearing a blindfold. Celera can see the public sequencing consortium's strengths and weaknesses—and, most importantly, their data—but the public HGP is ignorant of Celera's actions. In his earlier, highly touted successes in cloning disease genes, Collins often was only a collaborator on larger projects. How could he (or any academic, for that matter) stand up and deal with aggressive competition from what was soon to become a billion-dollar corporation?

Davies does not answer the nagging question of whether the decision to complete a "draft" sequence of the human genome was a pre-Celera action to get the public HGP moving or a reaction to Venter throwing his gloves into the ring. Nor does he delve into any details of what the initial level of support was from the non-USA sequencing consortia members for such a major deviation in sequencing strategy. They had almost completed the "finished" sequence of chromosomes 21 and 22. Continuation of a perhaps less altruistic approach of chromosome-by-chromosome sequencing (even in a draft form) may have limited Celera's ability to claim victory over the genome, without having to invest a lot more time and resources. We can hear some frustration in Maynard Olson's comment in *Nature*'s "Genome" issue: "each new round of press conferences announcing the human genome has been sequenced saps the morale of those who must come to work each day to do what they read in the newspapers has already been done" (*Nature* 409:816–818). Ultimately, the completeness and accuracy of the different versions of the human genome sequence will be tested over the next decade by many types of experimentation. However, for this book, more investigation into the politics behind these decisions would have moved it from being a good read to an excellent one.

This work has one important strength. It is effective in showing that each success of the HGP, from conceptualization through to mapping and DNA sequencing, followed close behind advances in technology and implementation of new strategies, one building on the other. This large-scale, technology-driven approach epitomizes how science will continue to be conducted into the 21st century.

Many of us who are working in the field of genetics and on the HGP may be too close to the topic to fully appreciate such an exhilarating story. Can you imagine the headlines in 1944, if a private corporation exploded a bomb that was created using many of the secrets of the Manhattan effort? What if an upstart aerospace company claimed to have the first moon rock in their hands, as Apollo was orbiting? It's just a great story, and, if only for this reason, *Cracking the Genome* should be read. It should also serve as a precursor for more books describing different versions of HGP events. Our community should read these books and, whenever possible, assist the authors in writing them. This will be the best way to ensure that the facts are accurate, so, when our students come to ask us about the history of the HGP, we can point them to the best sources.

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