

Book Review

Bold Science: Seven Scientists Who Are Changing Our World,

by Ted Anton (W.H. Freeman and Company, 2000) 193 pp., ISBN: 0716735121; \$24.95 (hardcover)

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What is *Bold Science*? It is the quest for answers to the far-reaching questions of our times; questions that range across conventional disciplines and challenge our knowledge of the world. While we could all easily choose great names from the past who followed this bold approach, picking names from today's diverse roster of scientific endeavor is more complex. Ted Anton has selected seven scientists who have made dramatic contributions to important, timely fields that have significant implications for the progress of science.

In each chapter Anton traces the scientist's early path, the varied approaches and turns upon this path, and the larger significance of the work accomplished. This book is very readable, even without extensive knowledge of these fields. Several chapters are extremely evocative portrayals of the individual behind the research; their drive to question, to educate themselves and to form new answers. According to Anton, "By combining the cheap tools of personal computers, remote sensors, the Internet, and basic artificial intelligence systems, they began to open an exhilarating and frightening era in genetics, ecosystems, cosmology, and neuroscience". The first chapter, on Craig Venter, embodies much of this approach. Combining automated DNA sequencing techniques, available libraries on the Internet and computer analysis, he moved ahead the effort to map the human genome at a dramatic pace.

In the second chapter, we are drawn into the whirling mind of Susan Greenfield as she began her studies as a philosophy major, moving by chance and inevitability into the field of neuroscience. Here is a scientist relentlessly curious, questioning the workings of the mind, and playing catch-up in a field she had just joined. Susan Greenfield is also a good example of Anton's point, that modern bold scientists are often adept at using the media to communicate their bold ideas and educate the non-scientific public. She is well known for her BBC series and popular book on the brain.

The third chapter, on Geoffrey Marcy in his long and lonely quest for extra-solar system planets is the most compelling in its tale of many years spent in the trenches of scientific endeavor. We are shown a young astronomer who, early in his career, had declared himself a “fully fledged failure”. From these feelings he reached out to a scientific quest he truly loved, something he could pursue regardless of career success or failure. There followed years of hard work, teaching full days, pursuing astronomy nights. He worked on the proverbial shoestring, cajoling help, embodying teamwork, and faced with setbacks. We are uplifted in his eventual triumph.

In the remaining chapters, Polly Matzinger conceived of an entirely new model for immunology and the fundamental question of how the body tells self from non-self. Her path to a career in science is a fascinating tale of many early turns and broad ranging interests in life. Her approach was interdisciplinary, and at times combative, but dramatic in its result. Saul Perlmutter’s quest is to find and measure supernova explosions as a way to probe the age and fate of the universe, To do this successfully, he used the Internet, and his personal enthusiasm, to coordinate the searches of observatories around the world. There were times of solid collaboration, but also events of professional jealousy. Gretchen Daily combined the disciplines of economics, ecology, biology and chemistry to ask “big questions about the complex interactions of nature and our role in it.” She launched her path through the unlikely coupling of German literature and Geology. Carl Woese did nothing less than find a whole new kingdom of life with startling implications for where we fit in the grand schema of earth.

In the final chapter, Anton tries to weave together common threads from all of the scientists. For many, the presence of the Internet has brought the international research community closer, and has allowed faster collaboration across fields and geographic boundaries, accelerating the pace of progress. It has also brought a heightened sense of competition in the drive to be first, and the desire to be acknowledged. At the same time, there is a refreshing sense of team-work among many of these scientists, and a willingness to discuss and explore in the classic traditions of academia. We see repeatedly the power of the academic *soirée*, and the exchange of ideas over good wine and food. Undeniably, computer technology, new sensors, and more processing power, have made studies possible that would have been unheard of ten years ago. Also, in many of these tales, the scientist professes a profound doubt or insecurity in his or her own abilities at some point in their career. How reassuringly human this is. Perhaps each is most bold in their very unique and personal quest for science.