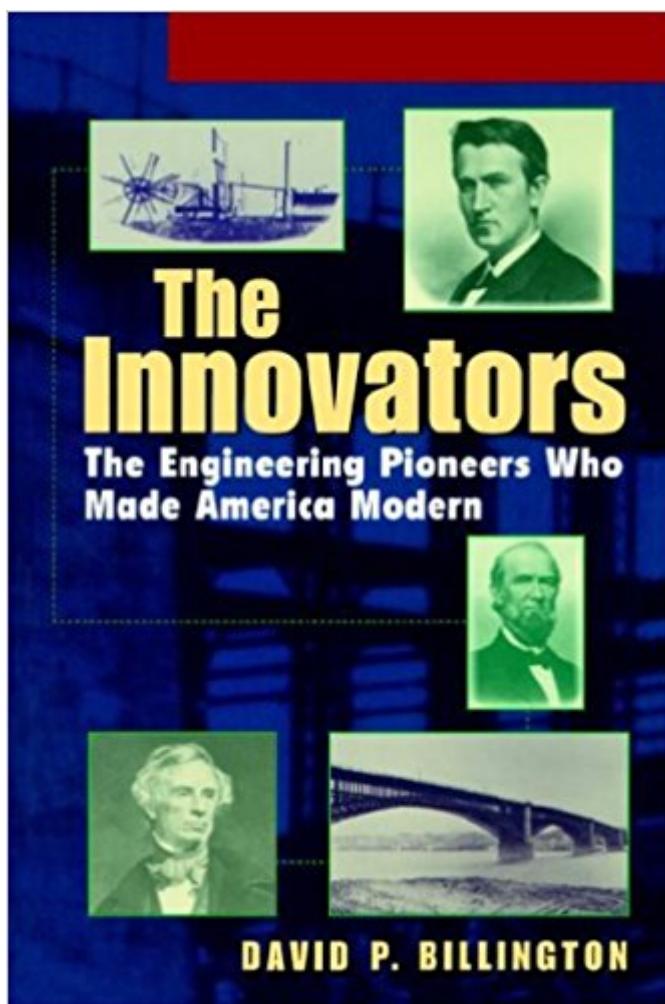


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# The Innovators: The Engineering Pioneers Who Transformed America



## Synopsis

A richly illustrated introduction to the engineering triumphs that made America modern. In this age of microchips and deep space probes, it's hard to imagine life before electricity or passenger trains. An astonishing series of engineering innovations paved the way to the twentieth century, and transformed America into the world's mightiest industrial power. *The Innovators* tells the exciting story of the engineering pioneers whose discoveries so dramatically altered commerce, industry, and world history. The book takes readers into the workshops of America's early engineering geniuses, explaining how they came up with their ideas and later applied them in the marketplace. Devotees of history and technology will appreciate the finely drawn profiles of America's technical wizards, from the famous--including Robert Fulton, the inventor of the steamboat; Samuel F.B. Morse, the inventor of the telegraph; and Thomas Edison, inventor of the first electrical power network--to the lesser known, such as J. Edgar Thompson, who built the Pennsylvania Railroad. \* From the author of the critically acclaimed *The Tower and the Bridge* \* Features over 80 illustrations of the engineers and their inventions DAVID P. BILLINGTON (Princeton, New Jersey), a professor of civil engineering at Princeton University, is the author of *The Tower and the Bridge*, and *Robert Maillart's Bridges: The Art of Engineering*, which won the 1979 Dexter Prize as the outstanding book on the history of technology.

## Book Information

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## Customer Reviews

In a world rocked constantly by an almost overwhelming string of technological wonders, it's easy to lose sight of the 18th- and 19th-century engineering breakthroughs that set the stage for today's

scientific and electronic advances. In *The Innovators: The Engineering Pioneers Who Made America Modern*, David P. Billington presents a series of intriguing profiles of such pacesetters as Robert Fulton, Thomas Edison, and Samuel Morse, whose inventions are responsible for so many of the developments we currently enjoy. --This text refers to an out of print or unavailable edition of this title.

Written from an engineering perspective, this fascinating book emphasizes the innovations that were truly basic to U.S. industrialization. The author uses a three-sided view to describe American engineering history: what great engineers actually did, the political and economic conditions within which they worked, and the influence that these designers and their achievements had on the nation. Billington explores the scientific basis of engineering through elementary formulas that also include the social issues of regulated loads, visually striking forms, acceptable risks, environmental issues, and the production of wealth.

Arrived in good condition very satisfied with purchase.

This book is part of a planned series on the history of engineering in the United States. As such it's pretty remarkable for just existing. Most people seem to think that engineering is just application of formulas, and that anybody with a calculator would come out with the same answer to any particular engineering problem. Billington attempts to show that this is not so, and that certain key engineers have essentially created the modern world of today. However, this book (planned to be the first of four) is not as readable as book two (*Power Speed And Form*). I think the problem can be demonstrated in the section about steel. In order to describe steel, he first goes back to the process of creating pig iron, then describes wrought iron, and finally the Bessemer process for steel. Then he highlights Andrew Carnegie for taking the Bessemer process and turning steel into a commodity (that he mostly controlled). This is just a much more disjointed story than, for instance, the story of the invention of the telephone or the airplane in the second book. Even though this book is called "*The Innovators*", very few of the people he highlights made the kind of individual breakthroughs that the Wright Brothers made. Perhaps this book should have been called "*The Adaptors*", as it really was mostly about engineers in the US adapting technologies pioneered in England and taking them well beyond what the English had done. This reads like a college textbook -- informative, detailed, and something most people will not read unless it is on a required reading list. In contrast, the second book read more like something from The History Channel, with more of a purpose of

making it enjoyable to read as well as being just as informational.

I have always been eager to learn as much as possible about those who are generally considered to be the most creative thinkers. In this book, Billington discusses several of them such as James Watt, Robert Fulton, Samuel F.B. Morse, Andrew Carnegie, and Thomas Alva Edison. What makes this book even more interesting and informative is the fact that he also discusses many others about whom I previously knew little, if anything. For example, Thomas Telford ("the designer as artist"), Francis Cabot Lowell ("no one played a more central role in bringing the industrial revolution to the young United States"), J. Edgar Thompson (among the first inductees in Fortune's "Business Hall of Fame, together with Ford, Edison, and Morgan), and Henry Bessemer (determined how to manufacture malleable iron and steel without fuel, thereby permitting mass production). Because of what these and other "pioneer innovators" accomplished during the 19th century, the United States emerged as the world's leading industrial nation. "The emergence depended...upon a series of major engineering events: the steamboat, the textile factory town [e.g. Lowell, MA], the continental railroad, electric telegraph, the iron and steel industry, the steel bridge, and the incandescent light." Moreover, Billington includes all manner of graphic illustrations of major inventions and explains how that engineering "has transformed not only the material life of our nation but also its politics and its culture." In Chapter 3, Billington suggests three competing ideas about the origins of technological innovation: "one, of innovation as a consequence of applied science; two,, of innovation as a response to political and economic forces; and three, of innovation as the result of individual genius." Billington succeeds brilliantly in helping each reader to understand the creative thinking and the achievements of various engineering pioneers "who made America modern" as well as the origin(s) of their technological innovation.

Professor Billington presents a neatly sketched vignettes of engineering pioneers in America. The book is well illustrated and the engineering calculations readily accessible to the lay reader. My interest while reading *\_The\_Innovators\_* was rather uneven -- some chapters seemed far more engaging than others, but this may have been a consequence of greater familiarity with some technologies compared to others. Nonetheless, the short biographies put human faces behind many of the technical innovations we take for granted today. Too much contemporary reporting focuses on either political intrigues or scandal. As Jean Henri Fabre observed "history records the names of royal bastards, but cannot tell us the origin of wheat." *\_The\_Innovators\_*, by contrast, presents a compact distillation of modern engineering that would benefit the technically trained and the lay

public alike.

The first and last chapter dragged as the author argued all around any points he was attempting to make. The middle of the book told a good story about technical advancement if you could get past the first chapter. The beginning and end were disjointed, rambling, and seemed contrived to impress the reader with the author's mastery of the subject matter more than making any particular points.

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