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### *Power Struggles: Scientific Authority and the Creation of Practical Electricity Before Edison.* By Michael Brian Schiffer. (Cambridge: The MIT Press, 2008. ix + 420 p., tab., ill., bibl. ISBN 978-0-262-19582-9)

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A useful bibliography is included but some notable sources are missing such as Joan Finnigan's *Giants of Canada's Ottawa Valley* (Burnstown: General Store Publications, 1981) which profiles Joseph Montferrand, and David Lee's *Lumber Kings & Shantymen : Logging and Lumbering in the Ottawa Valley* (Toronto: James Lorimer & Company Ltd. 2006).

Robidoux's book is in general entertaining but is difficult to follow as a historical treatment of the subject. The book presumes some knowledge of Ontario and Quebec, especially the St. Lawrence and Ottawa River valleys. For outsiders, a fuller description of the geography and historical context would help situate the logging and rafting activities, although Robidoux does try. The two maps are useful, showing the location of slides and dams on the Ottawa River, and location of falls and rapids on the Ottawa and St. Lawrence, but some names mentioned in the text are missing, which may lead some readers to look elsewhere for toponymy such as Hull, the Clyde and Timigami rivers, and the canals mentioned in the text. Another map or two would have been desirable.

Finally, the cover illustration, "Riding the Waves," does not immediately make a connection with the subject of the book—the raftsmen themselves. Many of the book's images may have made a better choice for the cover.

The main criticism is that the book suffers from organizational matters and much repetition. While the book is rich in data, the material could have benefitted from the use of side-bars to deal with the many facts, dates, and names. The illustrations are captivating, even stunning, and although most are self-explanatory, captions would have been helpful.

The most serious issue for the academic researcher is that few of the quotations or sources are referenced, although the bibliography is good. The appendices are interesting but not obviously connected to the rest of the topics.

Robidoux's book is difficult to use as a source of data, even though it is full of valuable information for the researcher on the topic of how the lumber and transport of logs to market was organized. Despite its shortcomings, the book is a valuable resource about an era fundamental to the economic growth of central Canada, and the technology of the time.

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***Power Struggles: Scientific Authority and the Creation of Practical Electricity Before Edison.* By Michael Brian Schiffer. (Cambridge: The MIT Press, 2008. ix + 420 p., tab., ill., bibl. ISBN 978-0-262-19582-9).**

Michael Schiffer's *Power Struggles: Scientific Authority and the Creation of Practical Electricity Before Edison* explores the history of electricity before Thomas Edison. Edison has been credited with developing the first

commercial electric grid in 1882, when he lit up New York's Pearl Street, but Schiffer argues that it was not the first commercial electric system and it may not have been the most groundbreaking. He develops this point by focusing on specific electrical technologies that helped to shape the course of electric development in the United States and Europe.

Schiffer, a professor of anthropology at The University of Arizona, is mostly concerned with technological change. He argues that behind the electrical developments that helped to form today's modern world are histories of negotiations between the people involved in bringing an innovative idea to market—namely, inventors, developers, producers, financiers, government officials, and scientists or natural philosophers. Foremost among the group were scientists, who managed to increase their social power during the nineteenth century by inserting themselves as voices of authority regarding electrical developments. Schiffer places Joseph Henry, an electrical scientist and the first secretary of the Smithsonian Institution in Washington, D.C., at the forefront of this initiative.

The author begins by outlining his methodology. He draws from behavioural anthropology and adopts an idea called "performance characteristic," at the heart of which is any person's interpretation of whether a specific technology ought to be manufactured and commercially sold. Schiffer points out that if an electrical technology was to succeed, its "anticipated performance characteristics [had to] match the performance requirements of specific activities" (p.7). In other words, people passed judgment on new technologies based on what use they perceived for that technology; if the technology did not meet that use, anyone involved in the development process, could deem the item "impractical."

Schiffer argues that during the eighteenth century the practicality of inventions was implicit: "inventors [...] took it for granted that their creations were practical" (p.12). He notes that it was not until inventions began to be commercialized in the nineteenth century that the practicality, or in other words, marketability, of these technologies began to be questioned. Also during the nineteenth century—first in Europe, then in the United States—scientists began to carve out a new role for themselves as arbiters of technical innovation. Schiffer reminds us that nineteenth century conceptions of technology deviated little from the idea that it was applied science. "This," Schiffer maintains, "is why many people believed that a man of science with relevant expertise could determine if an invention's operation was technically feasible" (p.39).

Thus, we see the scientist enter negotiations over the practicality of new technologies during the nineteenth century, and Schiffer highlights these negotiations by focussing on several case studies involving the electric motor, the telegraph, the dynamo, the arc light, and various electroma-

netic devices. The electric motor and the telegraph form much of Schiffer's focus, as he takes the reader through the conception, developmental, and acceptance stages of each technology. Throughout the entire process, negotiations take place with key groups of people, and it is through these debates that we see an elevation in the social power of the scientific community, especially through the Royal Institution in Great Britain, and the Patent Office in the United States, which acted as a gatekeeper in technological development.

Using case studies allowed Schiffer to remain focussed on his initial goal of examining technological change. His study is a great volume for anyone seeking to learn the early history of electricity, or early debates about technological acceptance, but anyone seeking new information may be disappointed. Much of his information comes from secondary sources, and in some cases entire chapters are almost entirely paraphrased from other authors. For example, chapter nine, which details Samuel Morse's early history and experiences with the telegraph is borrowed heavily from Kenneth Silverman's, *Lightning Man: The Accursed Life of Samuel F.B. Morse* (Knopf, 2003). Schiffer's originality lies in his methodological approach; historians of technology could be well served by incorporating a more archaeological viewpoint in their own work. Schiffer omitted a conclusion and chose instead to dedicate his last chapter to Edison. While useful for bringing the reader back to his starting point, a chapter summarizing the main points and reinforcing his thesis would have been more helpful in tying up the book.

In the end, Schiffer reminds us that "practicality" is not an inherent property of technology, but rather something that is socially and personally defined. In doing so, he touches upon the analytical styling of the social construction of technology, while at the same time drawing from his archaeological training to explain human choices. Anyone with an interest in the history of technology as a discipline or the history of electricity as a subject will find *Power Struggles* both informative and easy-to-read.

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***Engineering Invention: Frank J. Sprague and the U.S. Electrical Industry.* By Frederick Dalzell.** (Cambridge, Mass.: MIT Press, 2009. xii + 287 p., ill., notes, index. ISBN 978-0-262-04256-7 \$30 US).

The title "Engineering Invention" indicates the main theme of this book. Frank Julian Sprague (1857-1934) is known mostly as the first person to build a commercially viable streetcar system in Richmond, Virginia in 1888. Dalzell sees him as someone who stands just behind the first rank of