

collections (eleven of the 64 from the British Library, seven from the Bibliothèque nationale de France, and the rest from elsewhere), but the book also has a number of illustrations from *printed* maps, and these are not listed. Source information for printed examples must be gleaned from the text and captions.

Only one illustration is obviously badly cropped: the map of the harbor of Brindisi with sea monsters in a late eleventh-century manuscript of Lucan's *Pharsalia* (Figure 12, on page 25). The text describes various figures on either side of a tongue of land, but the upper figures are almost completely beyond the top edge of the picture.

All in all, I find this book to be an excellent discussion and sampler on the topic of sea monsters on maps. It covers, in a broadly accessible manner, the whole of the period of their common use, and establishes a pedigree for the practice of their inclusion. It proposes and discusses the medieval roots of the sea monster as a feature of cartographic furniture, the traditional vocabulary (rooted in classical pictorial practice and in contemporary evolving knowledge), and the grammar for their inclusion on the map face. It shows the birth, flowering, zenith, and decay of the practice, using well-chosen examples from a wide variety of sources, illustrated at appropriate scales with clear, sharp reproductions. Reasonably priced at \$35, it gathers together examples of sea monsters from maps that

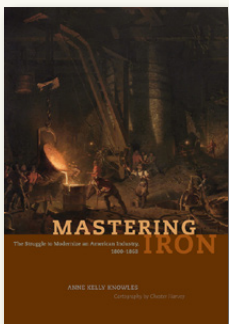
it would be onerous for an individual to wander about to see personally (even for someone living only eight blocks from the Library of Congress, where more than a few of the originals reside).

Van Duzer writes in his introduction: "To medieval and Renaissance beholders, the sea monsters on European maps represented real dangers, but to modern eyes they are among the more engaging elements of old maps, whether swimming vigorously, gamboling amid the waves, attacking ships, or simply displaying themselves for our appreciation" (8). Without a doubt, the sea monster is seen today as an iconic, albeit quaint and curious, element of old maps and charts depicting the sea; iconic, that is, regardless of how atypical it may have been even in its heyday.

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## MASTERING IRON: THE STRUGGLE TO MODERNIZE AN AMERICAN INDUSTRY, 1800–1868



By Anne Kelly Knowles.

University of Chicago Press, 2013.

336 pages, 66 color plates and 10 halftones (approximately half are maps), 2 line drawings, 8 tables. \$45.00, hardcover.

ISBN: 978-0-226-44859-6

**Review by:** Joseph Stoll, Syracuse University

It was with great anticipation that I opened *Mastering Iron*, having previously heard highly positive comments and having seen glowing reviews. I found that the contents of the book fully justified what I had heard and seen. This is a most handsome book, and exudes high quality throughout. The cover is nicely designed and encloses

pages of durable weight and finish. The pages are richly illustrated and includes colorful maps along with evocative period artwork.

In the introductory chapter, "Iron in America," Knowles explains the rise of iron's importance in the late 18th and 19th centuries, and its role in fueling the Industrial Revolution. The author further discusses how historical and economic studies have failed to compare development of iron industries across the iron regions of the US. These studies also lacked a comprehensive approach to factors of development. The scope of Knowles' study is described as one that reconstructs and understands the concrete places and regions where iron was made, including the variety of factors that came into play throughout those places—labor, management, transportation, modes of production, and immigration.

In Chapter 1, “Mapping the Iron Industry,” Knowles begins with a mid-19th century cycle of events. This cycle included the importation of cheap iron from Britain that was countered with increased US tariffs to stimulate domestic iron production. This in turn caused overcapacity, again inviting cheap British imports that further depressed the American market. In the mid-1850s, ironworks began closing as the economy spiraled into the Panic of 1857.

At the beginning of this crisis, the American Iron Association (AIA) was formed by East Coast iron manufacturers. The AIA’s constitution was written by J. Peter Lesley, its first secretary, who was also a topographical geologist. Lesley, along with Benjamin Lyman and Joseph Lesley, attempted to survey the entire iron industry from Maine to Alabama in order to comprehend its state. This effort resulted in *The Iron Manufacturer’s Guide*—a giant reference work. *The Iron Manufacturer’s Guide* became the basis of Anne Kelly Knowles’ work. She extracted data from each textual entry and parsed the details into a relational data base, connected them to geographical locations in a locational database and linked them into a “Lesley Historical Geographical Information System.”

Knowles uses the contents of Lesley’s survey to answer basic questions about the historical geography of the American iron industry. These questions address a range of topics: how the industry spread and changed, regional rates of growth and decline, extent and rate of adoption of the British model, regional developmental differences, etc. Knowles uses GIS-generated maps and diagrams along with tables to frame the discussion of these questions. The author also discusses the surveyors’ difficulties and attitudes that come to light in their correspondence and notes, and how these might have influenced the data they collected.

In Chapter 2, “The Worlds of Ironworkers,” Knowles begins by using art and literature to identify the living conditions of iron workers, and the environmental hazards and health risks they encountered. She discusses the distinctions in the rural areas, villages, and cities in which Lesley found ironworks, but notes that Lesley’s distinctions did not fully represent the character of places where iron was made. Her discussion looks at a broader variety of ironmaking communities, and the social and economic relationships found in them. This discussion identifies regional differences in ironmaking and general characteristics of work environments and labor relations.

In Chapter 3, “High Hopes and Failure,” Knowles recounts the American attempts to adopt the British model of developing coal-fired ironworks, undertaken to sustain the mass-production of iron necessary to supply the needs of US industry, agriculture, and railroads. Knowles describes the Welsh Dowlais Ironworks, and the efforts to replicate this Welsh model at the Lycoming Company in Farrandsville, PA and the Lonaconing Company in Lonaconing, MD. She analyzes the problems and failures encountered at these places, providing an explanation of the slowness of modernization of the mid-19th century US iron industry.

In Chapter 4, “The Elements of Success,” Knowles turns to more successful examples of adoption of the British model of iron-making. These examples include the Lehigh Crane Iron Works in Catasauqua, PA and the Trenton Iron Works in Trenton, NJ.

In Chapter 5, “Iron for the Civil War,” Knowles discusses the industrial production capacity with which each side entered the war. She also discusses the ways each side was affected by the industrial demands of wartime, as well as the war’s effects on recruitment and retention of skilled iron laborers. The discussion also includes social and economic aspects related to wartime production, labor, and management. The description of iron production in the South features the Shelby Iron Company in central Alabama, whereas the discussion of Northern iron production includes the Union’s industrial advantages over the South and the myriad technologies they used. For both sides, product quality proved to be of vital concern.

In the concluding chapter, “American Iron,” Knowles summarizes the state of US iron manufacturing following the Civil War. This summary looks at regions, stories, individuals, and technologies involved in the changes that occurred between the antebellum and postbellum periods of iron manufacturing. The US industry is also compared to the British and European models of manufacturing, with explanations of the distinctions that developed in the US—including not just technology, but also labor-management relations.

At the end of the book, Knowles includes over 70 pages of useful material, beginning with “A Note on Historical GIS” that contains the sources used for the Lesley Historical Geographic Information System. Also included in this segment are notes, a glossary, and a bibliography.

There are multiple ways to approach this book. In addition to simply reading it in the conventional fashion, a reader can meaningfully navigate via graphics. With so many rich maps and illustrations that are stories in and of themselves, one can move sequentially through these and search out the textual content that is relevant to each. In fact, I repeatedly approached the book in exactly this manner. Still another method is to seek out the main characters and case studies in the book, to appreciate the in-depth scholarship the author demonstrates and the scope of the material covered.

The content of this book will be of interest to those in a variety of academic disciplines. To me, it seems particularly well-suited to historians and geographers—especially those with cultural, economic, and industrial interests. In addition, anthropologists, sociologists, and even art and literature historians will find the scope of material to be of interest.

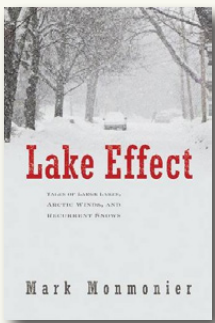
There is so much to admire in *Mastering Iron* that any criticism is certain to seem petty. If a subsequent edition of this book is written, I would offer a pair of suggestions based entirely on my own approach and experience. First, I would welcome an introductory section to serve as a “layperson’s guide to iron-making.” The glossary, which appears at the end of the book, is helpful; however, an early survey of the technology and key developments in iron-making (perhaps including a timeline) would be of great benefit. There is an immensely helpful section in Chapter 5 that explains the puddling, boiling, and Bessemer processes in production. Many readers would likely appreciate having these and other related processes explained at the beginning of the book, to increase their understanding throughout.

A second suggestion relates to the maps and is as much an observation as a suggestion. There appears to be a variety of symbol design schemes among the different maps. For example, Figure 63 is a map showing Confederate ironworks and Union territorial gains, 1861–65. This map uses symbols of distinct shapes and hues to distinguish different types of ironworks. Figure 14 is a map showing furnaces and deposits of iron ore and coal, using only hue to distinguish between different types of furnaces. Figure 17 shows sources of semifinished iron and iron ore for rolling mills, ca. 1854–58. This map uses yet another combination, with sizes and hues to distinguish between different iron sources. Whether these different symbol designs are intentional, I do not know. While each map is clearly explained and well designed, in my opinion the overall work would benefit from greater consistency in the use of symbols.

A unique pair of figures are found in Chapter 1F that warrant special mention. Each combine a map and a graph to show patterns of construction of blast furnaces (Figure 9) and rolling mills (Figure 11) both geographically and also over time. The author notes the inspiration for these figures being the idea of a musical score. I found both the idea and the execution of these figures to be of compelling interest.

In summary, *Mastering Iron: The Struggle to Modernize an American Industry, 1800–1868* is a wonderfully written and produced book. I give it my highest recommendation for anyone with even the slightest interest in the history of the US iron-making industry. I look forward to future work by this author.

## LAKE EFFECT: TALES OF LARGE LAKES, ARCTIC WINDS, AND RECURRENT SNOWS



By Mark Monmonier.

Syracuse University Press, 2012.

246 pages. \$24.95, Hardcover

ISBN: 978-0-8156-1004-5

**Review by:** Bob Hickey, Central Washington University

As a long-time fan, I was looking forward to reading Mark Monmonier’s *Lake Effect: Tales of Large Lakes, Arctic Winds, and Recurrent Snows*. It was particularly relevant, as I started reading the book in February at Chicago’s O’Hare Airport—hoping for an uneventful flight west.

Over the years, I’ve read a number of Mark’s books, going so far as to require *How to Lie With Maps* in my introductory cartography classes (Mark, if you’re reading this, an updated version would be greatly appreciated!). *Lake*