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### Automobilität: Karl Drais und die unglaublichen Anfänge.

By Hans-Erhard Lessing. Leipzig: Maxime Verlag Maxi Kutschera, 2003.  
Pp. 528. €32.

What the reader gets with Hans-Erhard Lessing's 528 pages is more than one book: it is partly a biography of Freiherr Karl von Drais; partly a history of the draisine, its diffusion, and its reception; and partly a revisionist look at the origins of automobility. Before discussing the book's merits, I should note a quality that may put off readers used to soberly presented research: Lessing approaches his subject with sometimes quirky humor—comments often appear in comic-strip balloons—and he freely draws parallels with the present and argues *ad hominem*. There are several interconnected themes, and interesting sidelights lurk on nearly every page. What is lacking is a strong narrative.

Although Drais lived in a period where there was almost no protection for intellectual property, his attempts to "improve" the society he lived in did not stop at the draisine. While concentrating on his human-powered *Laufmaschine*, he also invented a typewriter, a calculator, and a wood-saving furnace. But the *Laufmaschine*, writes Lessing, was a "demand-induced invention," a response to the shortage of fodder and the European famine of 1816–17. Lessing likewise suggests a single reason for its "failed" reception: Drais's sympathies for "revolutionary"—i.e., democratic—political aims, which led to his being ridiculed by contemporaries and later by historians.

Lessing assesses the numerous modifications and "improvements" to *Draisinen*, including hand propulsion and different geometries and construction techniques—a fascinating story of the development of an invention through the responses of its users. While he does not note any of the current debates among historians of technology, aspects of the social construction of technology are readily apparent. The same is true for his remarks about the attempts of the authorities to "regulate" *Laufmaschinen*, to restrict their use or even ban them from roads or public parks. The conflict between users of Drais's invention and the German *Obrigkeits* (government) after 1817 anticipated the conflicts involving bicycles and automobiles around 1890. Even the groups of first users are strikingly similar, and Lessing's thesis that the *Laufmaschine* was the true forerunner of all machines to facilitate individual mobility gains much plausibility.

Lessing also explores many paths of "automobility before the automobile." Ultimately, he attempts nothing less than a paradigm change regarding the history of early automobiles and automobile culture, asserting that "the whig historians suppress the parentage of the bicycle to the automobile" (p. 14). He presents strong evidence for the important role of bicycle technology for other "mobility machines" such as the airplane, and for a strong similarity between the bicycle culture and the early motor-car cul-

ture. Here, Lessing's book fits well within the recent reassessment of early automobility by scholars like Christoph Maria Merki and by this reviewer.

The book's layout mixes text, reproductions of illustrations, and quotations quite freely, strange juxtapositions that can either be annoying or inspiring. In my opinion, less would have been more. Still, the question remains: Has the author hit his aim? Considering that there were multiple aims, he has come close. His biography of Drais is authoritative, his assessment of the user history of the *Laufmaschine* and the early bicycle is fascinating to read, and his attempts to put the role of the "inventors" of the automobile in context should provoke mobility historians to some thought.

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### **The Industrial Revolution in Iron: The Impact of British Coal Technology in Nineteenth-Century Europe.**

Edited by Chris Evans and Göran Rydén. Aldershot, Hants: Ashgate, 2005.

Pp. ix+200. \$94.95.

For decades, economic historians and historians of technology have asserted that the Industrial Revolution was, at base, the substitution of mineral for organic fuel and of machine for human labor. In this interpretation, the British model of iron production was the epitome of coal-based modern industry. The key components of the model were smelting iron in large coke-fired blast furnaces and refining and finishing iron at rolling mills with coal-fired puddling furnaces. Each stage of the process was driven by steam engines, required massive machinery and capital investment, and created a new division of labor that lessened workers' control over production. The total package produced much more iron than was possible under the previous regime of water- and charcoal-powered ironworks.

In eight essays, the contributors to *The Industrial Revolution in Iron* collectively argue for a different interpretation of European industrial development. Remarkably consistent findings emerge in their studies of the transfer of British ironmaking technologies to Belgium, France, Germany, the Hapsburg Empire, Sweden, Russia, and Spain. Some parts of the British model were adopted everywhere, but not the entire system. Each country—and on closer examination each sub-national region—faced localized problems that prevented the implementation of one or more parts of the model. A region's iron ore contained too many impurities, or its coal coked badly, or good ore and good coal were located far apart, or the cost of transporting pig iron from mineral-rich localities to urban markets was prohibitively high. These factors have long been understood as impediments. What the contributors to this volume argue, however, is that we should not interpret