porary Boston are not completely dissimilar. The Internet creates virtual communities as electronic agorae, becoming "one of the informal public places where people can rebuild the aspects of community" (*2*). While losing his father, Alexander creates his own agora, a Web site on paralysis, that leads to interactions and even to a job offer from a physician who is highly impressed by the design of the Web pages. Alexander refuses the offer, but it brings him much needed support and reassurance during his time of loss and deprivation.

Lightman delivers a hyperreal world, in which readers are completely immersed in a fragmented multitude of electronically delivered demands created by a bureaucratic society of controlled consumption. Kafkaesque scenarios emerge like nightmares from which one does not wake up. A glimpse at redemption is offered by the possibility of true democratic interactions in private electronic agorae. If we compare *The Diagnosis* to a party, the book would be the admission ticket and the party favors would include serious reflection about the way we spend our days and our lives. Socrates, Kafka, and Baudrillard could not have had a more successful tea party in cyberspace.

References

1. J. Baudrillard, *Symbolic Exchange and Death* (Sage, London, 1993).
2. H. Rheingold, *The Virtual Community* (Addison-Wesley, Reading, MA, 1993).

BOOKS: TECHNOLOGY

Betrayed by Batteries?

Leonard S. Reich

Despite having entered the 20th century on equal terms with steam and gasoline-powered vehicles, the electric vehicle has failed to find an accepted place among the personal and commercial transportation systems of the United States. This "burden of history" is the main concern of the new book by David Kirsch, an historian of technology and business at UCLA. He wants to know whether the rapid and virtually complete dominance of internal-combustion vehicles was inevitable or whether, under slightly different circumstances, electric vehicles might have found a significant and enduring niche. The question is important because it has clear implications for whether we might yet, with a little tinkering, achieve a mixed-mode transit system that lessens our reliance on petroleum.

The Electric Vehicle and the Burden of History
by David A. Kirsch
Rutgers University Press, New Brunswick, NJ, 2000. 307 pp. $52. ISBN 0-8135-2808-9; Paper, $20. ISBN 0-8135-2809-7.

The burden that the author takes up is a heavy one. "What if?" and "If only..." arguments are difficult for historians because contingencies are rarely limited to small numbers of circumstances or events. In the case of vehicles, a complex web of interests, capabilities, technologies, demographics, and finances strongly influenced choices of hardware and fuels. Kirsch is also fighting a powerful determinist argument that declares internal-combustion vehicles were ascendant because they better met society's needs than the electric and steam alternatives.

Throughout the book, Kirsch carefully examines the advantages of the evolving gasoline vehicles and analyzes the extent to which they were inherent or the result of deficiencies on the part of electric-vehicle support networks. He valiantly claims that a little more interest on the part of electric-power providers, or earlier compatibility among electric-plug connectors, or realistic assumptions by potential owners of uses to which they would put their vehicles, or better systems for maintaining batteries and bearings, or some combination of these and other factors would have given electric vehicles the boost they needed to compete on something approaching equal terms. I am not convinced.

Electric vehicles were (and still are) hindered by battery technology, which has been surprisingly difficult to improve. The lead-acid batteries that they used limited range (from less than 50 to somewhat more than 80 miles, depending on load and road conditions). They took hours to recharge fully, which necessitated a complex system of battery exchanges to avoid lengthy stop-overs. Batteries deteriorated rapidly if not charged slowly and fully; and they weighed so much that they significantly detracted from the load-carrying capacity of the vehicles they powered. To cite just one among many examples from the book: At a time when their great weight condemned electric taxi cabs to ride on solid tires, the considerably lighter gasoline cabs used pneumatics, which gave them a much smoother ride, better control, and fewer accidents despite considerably higher speeds. That may be a deterministic argument for gasoline vehicles, but it is a convincing one.

In terms of business history and the history of a neglected technology, the book certainly breaks new ground. The extensive chapter on the Electric Vehicle Company and its so-called Lead Cab Trust finally explains why this well-financed organization with monopolistic tendencies and an excellent business plan failed on a massive scale in 1907, taking with it public perceptions that electric cabs and cars were bound to dominate urban transportation. The material on the electric utility industry's ambivalence about the electric-vehicle market is likewise enlightening, suggesting as it does the ways in which the purveyors of centralized electric-power generation were feeling their way to a workable business model. And the chapter on the electric truck examines the use of slow, battery-powered delivery vehicles to replace horse wagons for limited-range services. This last remaining market for electric vehicles lingered into the 1920s. But when the automobile encouraged suburbanization, geographical changes so strongly advantaged the internal-combustion truck that the market for electrics collapsed.

Horseless hansom cab. In early 1899, the Electric Vehicle Company offered residents of New York City both fleet cab service and long-term leases.

CREDIT: MUSEUM OF THE CITY OF NEW YORK

The problem for electric vehicles then and now is that they have had to make a compelling case for superiority in some set of attributes that attracts a significant number of buyers and users. Absent that, they have been overwhelmed by the economics of mass production, distribution, and service that have marked their internal-combustion competitors at least since Henry Ford introduced assembly-line manufacture of the Model T (before World War I).

Whether electric vehicles will finally find an important place in our transportation system when petroleum supply problems drive us toward gas-electric hybrids or full electrics is a question that remains open. Kirsch has addressed this question with keen historical perspective and provided a much-needed analysis of the circumstances under which electric vehicles have failed. In doing so, he has also suggested those in which they might succeed.

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