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STS.001 - book review

Nye, David E. *Electrifying America: Social Meanings of a New Technology*. Cambridge: MIT Press, 1990.

Electricity is a technology that is truly pervasive today, involved in nearly every aspect of our lives. It is not surprising, therefore, that there is much to be said about how this new technology, when it was developed and introduced, made its impact on American society. David E. Nye's *Electrifying America* discusses the history of electrification in America's urban, industrial, domestic, and rural spheres over the period of 1880 to 1940. The book is written in an explanatory, descriptive manner rather than a persuasive style with a clear thesis, but his viewpoint is that one must consider the development of electricity not as a history of invention, as it has traditionally been viewed, but instead a human process with economic, political, social, and philosophical effects. Rather than rehashing the story of Thomas Edison's invention of the electric light bulb, Nye discusses the relationship between electricity and several other familiar social movements influenced by technology, such as industrialization and the development of suburbs; ultimately, the most important point the book makes is that electricity is so greatly intermeshed with other technological and social changes that it is impossible to consider its impact in isolation.

Electricity is sufficiently ingrained into our society that it can be difficult to fully recognize its impact. Specifically, technologies that depend on electricity are so ubiquitous that imagining life without them is not easy. Accordingly, it is fortunate that the introductory chapters to Nye's book describe how people of the time initially viewed electricity. He begins by stating that "in the 1880s the electric light was hardly the commonplace of today, controlled by the casual flick of a wall switch. It bordered on the supernatural ... any form of artificial light astounded people because it

violated the natural order” (2). This is followed by a number of descriptions of early electric installations. For example, he notes that electric lighting, initially installed in the form of street lights, was revolutionary because it could provide many times more light than earlier gas lights with much lower costs, and without the risk of explosions. Though he does later provide statistics to support his data, the introduction is written largely in a more anecdotal style. Nye notes that the town of Muncie, Indiana is so typical of mid-sized American towns that it was often referred to as “Middletown” and even had a Center for Middletown Studies; accordingly, he claims that, with regards to electrification, Muncie can serve as a microcosm representative of the rest of middle America. By describing the electrification of Muncie rather than speaking broadly of the country as a whole, this section of the book takes on a more personal flavor; by quoting contemporary primary sources such as newspapers, it provides insight into how people viewed electricity at the time. Similarly, descriptions and pictures were provided of the extravagant lighting installations along the “Great White Ways” of large urban streets and at exhibitions such as the World’s Fairs; these spectacles provided a clear illustrative example of how electricity was initially viewed with awe and wonder. In short, Nye is remarkably effective at bridging the gap between the modern world where electricity is second-nature and an earlier time when it was a remarkable novelty, even for readers such as myself who have never experienced life without electricity.

The remainder of the book is organized into chapters that each discuss the impact of one major technological sector that was influenced by electricity. It can be roughly divided into four sections: the electrification of the urban, industrial, domestic, and rural environments. Nye first discusses electrified technologies in towns and cities, including the municipal electric utilities that provided lighting on the streets, and electric-powered transportation both within a city (streetcars) and between cities (inter-urbans). He then explores the role of electricity in factories and the critical impact this had upon the American economy and labor force by promoting mass production and industrialization, which I discuss in more detail below. Next, he considers the electrification of the home, which had a social impact on a smaller scale: electric appliances in the home “take over

housework, and the home is no longer defined by production but by consumption” — or, alternately, “new appliances meant not more freedom but the expansion of corporate control” (238). Finally, he comments on electricity in rural America, beginning with the process of providing power to the countryside through the Rural Electrification Administration and other government programs, with their numerous political implications. Once the electric distribution lines were in place, Nye explains how the resulting technology on the farm dramatically increased the productivity of farmers, allowing a smaller number of farmers to produce much more food. This structure of the book might tend to suggest that each of these issues should be considered separately, because it draws the chapter divisions such that each chapter focuses on one individual type of technology. However, they are certainly all inter-related to some degree, as there are so many common social issues involved. Nye constructs his discussions of each technology such that the reader is able to detect a number of common threads tying the book together; they gradually become apparent throughout the body of the text, and the concluding chapter brings them fully into light, explicitly revealing the key connections.

Of these common themes, one of the most prominent is the question of whether providing electric power falls under the domain of government authority or should be handled by private industry. Nye provides a number of historical examples from each side to demonstrate how today’s balance between public and private control of electricity was reached. Initially, there was no clear consensus; in Muncie and many other towns, there were “not one but three electrical systems. The first was private and served downtown business and a few wealthy homes. The second was a municipal plant for street lighting. The third was private and drove the streetcars . . . the merger of the three systems was not a rapid process” (26). In the case of the electric streetcars, Nye asserts that they were largely private enterprises because of their “operational and financial requirements” that required them to be run by large companies, often monopolies (92). This effect was not limited only to the streetcars: “in the United States the new technology generally was used to consolidate economic power” into a few large corporations in each industry (385). The same issue recurs in the

subsequent controversy over providing power to rural areas. In this case, the private power companies, which had by then proved dominant in America, had failed in this regard: electric lines were not available to 90% of farmers (287). Nye argues that “only government intervention, which had been notably successful in European countries, could begin to solve the farmer's problems,” and that Roosevelt’s Rural Electrification Administration and Tennessee Valley Authority programs were necessary (307). His arguments to support this claim require particular scrutiny, as it represented such a significant change in the federal government’s role in energy. Nye notes the opposition from conservatives who felt they were unreasonably socialist policies, but he does not really directly address these philosophical arguments, aside from noting that they led to a number of compromises in the programs. Instead, his support is based on a more pragmatic argument that the programs were justified by their results; he cites popular songs and similar evidence to claim that “overall the TVA had widespread support among ordinary people who benefited from the stimulus,” as well as the fact that the TVA and REA did, indeed, succeed in their goals of providing electricity to rural America (314). Nye makes it clear that the issue of public/private funding for electrification is one of the major themes in the development of electric systems, and his argument for the necessity of government involvement is reasonable, though I felt it would have been stronger if it addressed the associated political philosophy issues mentioned above.

The other central theme of the book is that the introduction of electricity led to technologies that changed the social structure and lifestyle of America. The first example given is that streetcars and inter-urban electric railways, along with communication systems such as the the telephone network, effectively extended the radius of cities, allowing layers of suburbs to be constructed around the city center. The result was that people were able to migrate away from the city and yet effectively remain close to it: “American electrification [had a] double action — strengthening the link to the city and then facilitating dispersal into the hinterlands” (384). Rural electrification had similar effects, as it allowed people living in the country to have many of the same conveniences as city dwellers. In addition, it increased farmers’ productivity so greatly that a much smaller number

of farmers were necessary to provide for the rest of the nation — more than 50% of Americans were farmers in 1910, compared to less than 3% in 1980 — another dramatic change (382). The social implications of these changes were profound; Nye notes that, as a result of the American sense of individualism, “Americans used the flexibility of electrical power to atomize society rather than to integrate it” (384). He writes that “these results were culturally determined” and reflected not the technology itself but the goals of those who created it; this supports his central argument that electrification needs to be viewed not merely as an engineering problem that was solved, but a social process (384).

The electrification of factories also led to major changes in American society, by facilitating mass production and industrialization. I found it quite interesting to learn that the physical moving assembly line was not, as is commonly believed, the only key innovation that allowed Ford’s system of mass production to function. Rather, electricity was also a necessary predecessor, as individual electric-drive motors on machines allowed the machines to be arranged in the order in which they were used to create the product, instead of being constrained by the physical requirements of steam engines and their drive shafts. Accordingly, Nye discusses the more well-known consequences of industrialization and mass-production as results of electrification. In particular, he discusses extensively the de-skilling of workers that took place because factories required semi-skilled workers who could be trained to perform one task repeatedly, rather than artisan-type craftsmen. I was, however, curious to learn more about how this electrification and industrialization affected the demand for highly skilled electrical engineers and technicians to build the necessary machines, and was disappointed that this topic was not covered as extensively. To be sure, there was some discussion of the increasing skill difference between engineers and laborers, but I would have found it interesting if there were more information about the rise of modern engineering, with its analytical emphasis. Even so, I felt that it was only a minor shortcoming.

The greatest problem this book faces — and also, arguably, one of its strengths — is its

breadth. Electrification is clearly a vast subject, encompassing many technologies and associated social issues, and it is impossible to discuss them all fully in one book. Nye provides an excellent overview of many of the key impacts of electricity, but some of them are not covered very deeply; for example, in addition to the subjects mentioned above, he also writes about such topics as positive and negative portrayals of electricity in art, the introduction of electrical terms into the general American vocabulary, and the visions of a utopian future through technological progress. In some cases I was not able to fully comprehend the impact of some of these effects because there was only enough space for them to be mentioned briefly. The problem is intensified by the fact that electrification is so closely related to other major topics in the history of technology, such as industrialization and the development of urban and suburban communities; there is so much to be said about these subjects that entire books can and have been written about them. The result is that Nye's book quite successfully demonstrates that electricity is closely intertwined with numerous other important technological and social topics, even if it is impossible to describe in complete depth the extent of every effect.

On the whole, I enjoyed Nye's book and was quite impressed by it. I felt it was an excellent summary of the many ways in which the development of electricity affected American technology and culture. The writing was generally very clear, and the balance of primary and secondary sources provided the book with both credible historical arguments and vivid first-hand descriptions of how human lives were influenced. The only real flaw was that *Electrifying America* covers so many topics that it only scratches the surface of a few of them; however, even this could be considered a reflection of the book's quality: it was able to provoke in me enough interest in the subject that I was disappointed when it did not discuss certain areas in more depth. Ultimately, I found myself convinced of the validity of Nye's contention that "people do not merely use electricity. Rather, the self and the electrified world have intertwined ... electrical machines had social and symbolic uses that belie the idea that they were ever purely functional devices" (390, 391).