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Book Reviews
Europe's Infrastructure Transition: Economy, War, Nature

Jon Agar ✉

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This is an excellent book that shows how Europe has been built and divided by technological systems. It is one of six books emerging from the third iteration of the projects that began with the 'Tensions of Europe' research network in 1999, part of a series called *Making Europe*. However, the volume very much works on its own terms, and I found it an engrossing read.

The central category of actor in this history is Thomas P. Hughes' 'system-builder', the individual person (rarely organization) who envisions and assembles the social

system-building intensified from the nineteenth century onwards, what the authors call the 'infrastructure transition'. Europe's Infrastructure Transition therefore 'documents the visions, priorities, and choices of Europe's system-builders as they constructed or blocked connections in infrastructure, the economy, the military, and the environment' (p. 9). The systems in question include railways, telegraph (optical and electrical), roads, canals, airlines, radio, electricity supply, oil pipelines and information technologies, as well as the other networks (such as chemical production, food distribution and finance) that use and redirect them.

Examples of European systems-builders include Albert Thomas (the French director of the International Labour Organisation who convened two motorway congresses in the 1930s); Gunnar Myrdal (the leader of the United Nations' Economic Commission for Europe, UNECE, a recurring presence in the book, responsible for the E-Road system amongst others); or the Railway Transport Council that rescued and reshaped the railways of fifteen independent ex-Soviet republics in the 1990s. Of most interest to *Annals of Science* readers might be the category of 'knowledge system-builders' that the authors deploy to describe, for example, the people who built networks to gather meteorological, ecological, cartographic, hydrographic and other scientific forms of knowledge.

The technological systems of concern are not just in Europe, but reshape or question what 'Europe' should be taken to mean. 'Europe' is partly a representation that depended on the state of geographical knowledge. Or, another type of example, when Russia built the Trans-Siberian Railway, as well as two Central Asian lines, these 'projects challenged the very perception of the Urals, the Caucasus, and the Caspian as "natural" borders between Europe and Asia' (p. 30).

One of the most useful ideas in *Europe's Infrastructure Transition* is the category of 'border-builders'. Anti-systems thinking has been emphasized before by historians, but here we have many well-worked examples of how systems built to encourage

not to build new systems, but to control and restrict the flows and channel them' (p. 37). So railways and roads built for transport were interrupted and regulated by border points; governments put up tariffs; and the Iron Curtain divided East and West in the Cold War. The last example was 'not merely a matter of cutting existing East-West links and preventing new ones from emerging (...) the challenge was rather to establish efficient ways of regulating and controlling East-West flows to the desired extent' (p. 48). Border-building could be as effective in shaping Europe as system-building. For example in 1935, a train from Vienna to Berlin took half an hour longer than in 1914, while the train to Istanbul was delayed by seven hours. So much for the nineteenth-century vision of the annihilation of time and space.

War planning encouraged both systems-building and border-work. It was one of the central factors shaping Europe's systems, constructively as well as destructively. The same can be said for 'nature'. *Europe's Infrastructure Transition* should be praised as an example of historians of technology paying attention to environmental history. Like armed conflict, the relationship of technological system with environment was not merely destructive. So, while cases of pollution are discussed, such as the poisoning of the Elbe and tributaries to the Rhine or the Torrey Canyon oil spill, there are also intriguing examples of 'ecological system-building', such as building connections between habitats to encourage the flow of wildlife in Europe. The authors locate the origin of this ecological network idea in 1970s Estonia and Lithuania. Remarkably parts of the Iron Curtain became planned as an ecological corridor in the 1990s, a case of negative border becoming positive system.
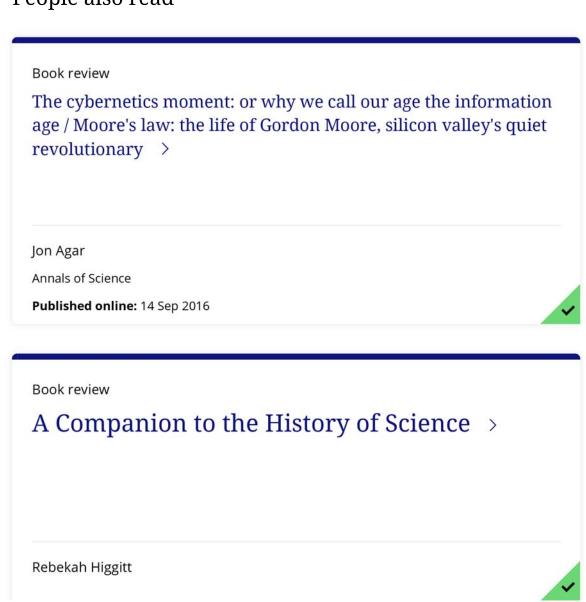
The general picture presented of the history of European systems and borders is a freeing up of flow in the nineteenth century, followed by border construction and anti-systems-work culminating in the wars of the twentieth century, perhaps overlaid again by increased mobility as systems were interconnected. The first, nineteenth century phase is captured by the 1830s vision of Michel Chevalier of a Europe so interconnected by unimpeded communication and transport that peace

promised (p. 3). Their answer, surprisingly perhaps, is yes: 'border-builders have not been able to prevent the realization of Chevalier's "circulation society", and today trans-border flows of goods and capital are immense, compared to 150 years ago' (p. 359).

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