

Making an Impact

A History of Technology Perspective on "Making Europe"

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This series centralizes technology as an essential force forging (and forged by) Europe's self-construction over the long twentieth century, focusing on both national and transnational examples. The books emphasize cross-national ties of knowledge exchange for establishing common European ground (interrupted by wars and nationalist power jockeying). A strong emphasis on infrastructure, institutionalization, system, cross-border networks, standardization, expertise, and knowledge exchange and appropriation marks these volumes as beautiful extensions of decades-long scholarship in the history of technology.

This landmark series impressively showcases the valuable reach of new scholarship conducted within the multi-year *Tensions of Europe* initiative. The wealth of international collaboration pays off here with a powerful intellectual framework, buttressed by far-reaching comparative specifics. This approach adds a broad sweep to enrich major themes within recent history of technology, placing humans and sociopolitical context at the heart of technological development, defined comprehensively to encompass concepts, information, and skills. The six volumes clearly express this shared perspective in theoretical approach, while giving each set of writers liberty to emphasize specific themes. The sheer chronological and geographic scope of the examples wielded to illustrate historical points is striking. The authors skillfully muster details on the history of Esperanto, Barcelona's bicycling festival, radio traffic reports, the Swiss NAGRA portable tape recorder, the International Container Bureau, and many more cases.

Volume 1 highlights the "consumers, tinkerers [and] rebels" who pooled knowledge and power in "transnational user movements" to defy technocratic restrictions and sculpt their own cultures of enthusiasm. Following a clear chronological structure, authors Ruth Oldenziel and Mikael Hård open with nineteenth-century case studies of transnational fashion history, home comfort, and train travel that embrace a common theme of how middle-class consumers adapted designs originating in luxury markets. Vivid detail shows how transnational circulation of textile technologies (style magazines, fashion plates, paper patterns, sewing machines) allowed women in South Africa, Czarist Russia, and British domestic service to appropriate French *haute couture*, tinkering with its styles "as individuals and as a politically organized user movement." (47) Chapter two offers a similarly wide view, linking analysis of Russian peasant huts, Istanbul street modernization, Vienna's well-built working-class estates, Italy's lower-quality ones, and European housing co-

operatives to the history of progressive reform, medical modernization, and consumers' own perceptions of housing conditions. Chapter three emphasizes how railroad and ship businesses promoted ideals of interconnection while fragmenting travel along radically differing class lines. Standardized packages for wealthy *Wagons-Lits* consumers and middle-class *Thomas Cook* tourists set up transnational comforts safely isolated from "the other," even as poor immigrants shuttled through humiliating, frustrating bureaucracy, aided only by equally transnational self-help networks.

The first of three interwar case studies in Volume 1 presents European bicycle clubs as another "pioneering user movement" that balanced patriotic national identity with culturally progressive cosmopolitanism while organizing a pan-European cyclist infrastructure of roadside repair kits, excursion services, and border-crossing assistance. Oldenziel and Hård revisit themes of class in relating how urban workers adopted bicycle commuting, even as street-use policy privileged automobile owners, as seen in comparative analysis of bicycling infrastructure regulations in Nazi Germany, Fascist Italy, Britain, and the city of Amsterdam. Analyzing food production and kitchen design, the next chapters link class tension to histories of colonialist food empires, Cold War ideology, and the valuing of user input, backed by stories of Swiss chocolate marketing, Polish milk bars, Yugoslavian supermarkets, and Western appropriation of Bulgarian yogurt.

Volume 1 ends with a valorization of post-1960 bottle-recycling campaigns, windmill construction, and family bicycling as uniquely European grassroots environmentalism. Chapters celebrate European homemade doll clothing (with no acknowledgement of girls elsewhere also making their own), alongside tributes to Dutch hobby clubs, counterculture retailoring of jeans, and Prague's affordable wireless. Heralding computer piracy and hacker movements as innovative tinkering aimed at resisting American corporate oppression, the conclusion moralizes, "When individual users of consumer goods transform themselves into user-citizens, they become a force to be reckoned with." (326)

Volume 2 radically shifts attention away from everyday users sharing informal do-it-yourself advocacy, toward the history of top-level technoscientific experts who constructed and deployed their own international knowledge-sharing to shape European development. Martin Kohlrausch and Helmut Trischler trace how elite specialists fostered cross-border technological exchanges to shape standardization in European measures, railroads, and telegraph systems. Pointing to Czechoslovakia's Bata factories, the authors argue that rationalized modernism in "technology and scientific progress had become part and parcel of European self-definition." (139) Yet while positioning themselves as apolitical, visionary internationalists, engineers bolstered national identity, building the Suez Canal, German dams, Swiss tunnels, Portuguese railroads, and more. Short biographies show how this

ambitious drive to re-order society tempted some experts into an opportunistic “Faustian bargain with totalitarian regimes.” (15) Guglielmo Marconi offered Mussolini’s regime technoscientific legitimacy; Trofim Lysenko’s peasant-friendly image made his Lamarckian approach politically invulnerable and helped combat resistance to Soviet collectivization. The book pointedly notes that while agriculture expert Konrad Meyer accepted Nazi funding for barbaric population-cleansing, postwar “whitewashing” of his image let Meyer lead trans-European spatial planning, under less offensive justifications of political integration and environmental health. The book links experts’ movement across international networks to a “denationalization of technoscientific expertise,” (200) citing pre-WWII emigration of German scientists to Turkey, and the postwar Soviet/American race for Wernher von Braun and other Nazi assets as “intellectual reparations.”

Kohlrausch and Trischler conclude by unpacking Cold War and present-day European politics of expertise, emphasizing the vital links between peoples and groups as a “hidden integration” for knowledge-sharing. (17) Analysis centers around the “geographies of cooperation in nuclear Europe” (205) (explored via CERN’s Large Hadron Collider, Euratom, and smaller collaborations), along with space-race histories of the Soviet Interkosmos program, the European Space Agency, and the Franco-German Symphonie satellites. While warning that ongoing national loyalties and regional proximities hinder trans-European collaboration, the authors say, “the strong role of knowledge in Europeans’ self-understanding” means that European integration “was built, is built, and will continue to be built on expertise.” (311)

In Volume 3, Per Högselius, Arne Kaijser, and Erik van der Vleuten extend the focus on European techno-scientific knowledge networks by exploring the “dynamic interaction between system-building and border-building.” (24) Unpacking the “visions, choices, and endeavors” (351) of politicians, engineers and bureaucrats, they see periods of liberalized trade and travel alternating with eras of restriction, as ever-larger wars defied dreams of pacifist universality. Tracing “Europe’s infrastructure transition,” starting with nineteenth-century Belgian, French and German road, river, and tunnel construction, Volume 3 details the “geographies of connection and rupture” (144) that benefitted already advantaged parties while deepening inequities of distance and poverty. Sections on European energy history follow visionary ambitions for pan-European power-superhighways, through Cold War superpower maneuvering, 1970s oil crises, and post-Chernobyl environmental concerns, to 2006’s service breakdown that “exposed a hidden European integration on which millions of Europeans depended, but of whose extent few had been aware.” (67) Other chapters explore historical tensions between connectivity and national self-interest in Europe’s financial services, chemical industry, and food business, with details about Rotterdam’s harbor and economic infrastructure, the trans-national Rhine economy, and African groundnut exports.

Following a chapter on communications infrastructure and military logistics from 1914 through the Cold War, Volume 3 directs attention to “the interdependence between infrastructure and scientific knowledge.” (311) Specifically, the authors see land mapping, geodetic science, and aerial topography, as system-building for landscape knowledge, enmeshed in the geopolitics of national parks, ecological corridors, and similar “green infrastructure.” The chapter on “troubled waters” uses case studies of Rhine and Danube re-engineering, Spanish river diversion projects, and the Nord Stream gas pipeline to suggest how system-builders recommended remedying infrastructure-related pollution by building new infrastructure. The authors conclude that “it is in the common sky above Europe” that “mutual dependencies” became most evident, given cross-border concerns about acid rain, post-Chernobyl radioactivity, greenhouse gases, and bird conservation. (347)

This focus on expertise and system-building continues into Volume 4, which analyzes how decision-makers operating “behind closed doors” set policies for cross-border movement of communications, materials, and people. Wolfram Kaiser and Johan Schot argue that long-term working collaborations established a culture of “technocratic internationalism” that sought to depoliticize technology-related disagreements by seeking voluntary consensus around “the best” answers. Following those networks of negotiation from nineteenth-century professional congresses through the World Wars and Cold War, the authors see experts approaching industrialization and social challenges as chances to exercise an idealized rational judgment while legitimizing their autonomy through shared rituals. “Making rules for Europe became intimately linked to the idea of European political integration,” the book suggests, with case studies of the interwar European Transit Organization and the later UN Economic Commission for Europe. (104)

In tracing the “hidden integration of Europe,” Volume 4 compares the history of cross-border railroad standardization and the development of steel cartels, moving on to the postwar Coal and Steel Community and the EEC’s European Commission. Kaiser and Schot emphasize historical continuity, declaring that “nineteenth-century technocratic internationalist working patterns and practices [...] still exert a strong influence on the EU’s day-to-day work [...] embedded in informal institutional rules.” (306) The authors characterize recent regulatory policymaking in food safety, biotechnology, and for mobile phones as repeating a history in which experts deployed technical arguments to garner authority and conceal politicized interests. The conclusion suggests that as opaqueness and a seeming lack of accountability inspired public backlashes against bureaucracy and EU power, modern climate-change movements may “herald the greater democratization of expertise,” foregrounding the “unresolved tensions between technocracy and democracy” in a pluralistic, connected world. (313)

Volume 5 links directly to Volume 4, in examining “the long history of European techno-political diplomacy in information and communication tech-

nologies.” (3) It further connects to Volume 3’s analysis of national interest and optimistic openness as competing priorities, resulting in “intertwined dependencies” of infrastructure (14). Authors Andreas Fickers and Pascal Griset trace the geopolitical and economic dynamics of empire-building telegraphs, telephones, and wireless, seeing radical shifts in information-access that fueled both “technological nationalism” and rebellion against it. (60) Volume 5 echoes Volume 2’s foregrounding of a top-down “culture of regulation” privileging technoscientific expertise, as it follows European negotiations over radio frequencies and television standards. At the same time, Fickers and Griset return to Volume 1’s theme of bottom-up user appropriations, discussing how listening communities framed radio messages through localized interpretations. The book traces media projects, such as *Eurovision*, that ambitiously aimed for cross-border integration, but also describes the way *Tele-Saar* and *Radio Luxembourg* used popular appeal to compete against high-culture state broadcast monopolies. Fickers and Griset consciously reach beyond the history of media connectivity “success stories” to show how conflicts and jamming spurred creative responses, such as Cold War subversive cross-bloc communications. They extend the analogy to portray WikiLeaks, hackerspaces, and anti-capitalist hacklabs as exemplifying distinctly European “hackivist culture.” (232)

Stepping back to analyze European information-sector trends over recent decades, Volume 5 traces state innovation policy and private initiatives from pre-WWII calculating machines, through Bletchley Park, Lyons Company computing, and automatic tellers. Complex threads compare postwar computing in Germany, France, Sweden, Finland, the Soviet Union, Czechoslovakia, and Poland. Fickers and Griset emphasize that American defense funding and aggressive corporate marketing “defined spaces European companies could not penetrate,” undercutting their “often-brilliant research initiatives” to foster “strong technological dependence.” (314) European nations still produced strong innovations, such as France’s Minitel service, Finland’s Nokia, and Russia’s Yandex search engine, but outside of “niches and business-to-business market segments,” too many firms remained internationally uncompetitive. (327) Europe succeeded in standardizing high-quality, affordable telecommunications networks, but with players “too small to develop research that could have a real impact on the world market [...]. Despite real dynamism in adopting new technologies and creating new social or cultural uses, Europe’s information and communication industries remained fragile, underscoring their significant decline.” (329) The conclusion warns against “political timidity, which obstructs Europe from balancing U.S. influence, and economic weakness, which cannot prevent promising European start-ups being bought by American giants.” (376)

The series’ final volume places technology at “the very heart of European colonialism and European identity.” (277) Maria Paula Diogo and Dirk van

Laak echo other volumes in considering the role of engineers and technocrats, for whom foreign territories served as both “a dynamic job market” and “field laboratories” to test tools of control. Beyond national rivalries in exploration and conquest, “colonizers still felt a common ‘Europeanness’ in sharing a comparable set of scientifically and technologically based knowledge and skills, in contrast with the others [...]. Technology therefore is at the very heart of what [...] was meant by ‘Europeanization.’” (16) Volume 6 shares the other books’ attention to the history of international telegraphy, alongside multiple additional cases of “technological interpenetrations,” (59) including the Baghdad railway, Siberian railroads, British rubber plantations, wartime photography, and air policing.

Diogo and van Laak concisely review the historical exploitation of African resources, moving from Portuguese/British railroad-building races, to Europe’s twentieth-century techno-utopian megalomania for “greening the Sahara.” Emphasizing the role of non-Europeans as “scientific and technological agents in their own right,” (9) the book offers beautiful comparative analysis of socio-political responses to Western technology in Japan, India, and China. Diogo and van Laak contend that scholarship on decolonization has paid insufficient attention to technological dimensions, such as resistance movements’ use of radio. Looking at Nehru’s technologically assertive independence initiatives such as the Bhakra Dam, they conclude that “euro-Western technology played a formative role in framing both India’s and China’s postcolonial national identities” under Western-educated elites, but “local political, economic and cultural circumstances were decisive in determining” terms of technological rejection, appropriation, assimilation, and use. (230) Returning full circle to Volume 1’s examination of tourism history, Volume 6 characterizes Club Med’s technological infrastructure of sanitized “authenticity” as “gentle imperialism.” (263) Despite rhetorical pronouncements of peaceful progress, “new technologies tended to reinforce rather than mitigate existing societal imbalances and asymmetric power relations,” Diogo and van Laak write. (279) Non-Europeans struggled to resist “the seductions of Europe’s technologies [...] [and] the promise of [...] *being integrated* into the global networks of knowledge.” (282–283)

Taken together, the volumes in this series provide a multi-dimensional technological history within interlocking contextual frameworks. For example, Volume 1 links railroad development to the experiences of diverse passengers, Volume 2 describes tunnel-building and system-building expertise, Volume 3 looks at railroads and Holocaust transport, while Volume 4 analyzes the history of international rail standardization. While each volume can clearly stand alone, such resonances make them far richer together. The writing is beautiful, gracefully laying out a wealth of specifics to illustrate clearly articulated principles. The volumes are further enhanced by excellent illustrations with comprehensive captions.

At the same time, the cross-volume repetition of certain themes and examples can generate some frustration. Accounts of international telegraphy agreements appear multiple times, as do the histories of submarine cables, time signals, and radio conferences. Such duplication comes at the cost of neglecting other potentially worthwhile topics. For instance, these volumes do not offer much in regard to the history of European factories, work processes, and labor. The topic of technology and poverty earns passing mention, but without sustained investigation. History of road development receives substantial coverage, but automobiles relatively little. Outside of Volume 1, the focus on experts, elites, and decision-makers pushes aside the histories of how ordinary citizens experienced, used, and shaped technological materiality.

Yet the beauty of this work on international spaces, systems, and modernities in the history of technology is that the project itself displays the strength promised in transnational cooperation. Individually, these volumes may not always strike historians of technology as revolutionary, in part because some of the authors' research has already made a significant impact on the field. But the true prize of this project is its collective weight, a tribute to numerous years of effort by the many scholars and organizers in the *Tensions of Europe* community. Some historians of technology today express concern that the discipline has grown imbalanced, with too much preponderance of attention sometimes centering on twentieth-century U.S. studies. This project serves as a noteworthy counterweight to that issue of geographic distribution. While previous studies of various elements in British or French or German or Soviet history of technology have certainly offered essential insights into the European story, few separate works can make such a statement as this series, in marshalling such a wide-ranging, multi-dimensional analysis.

The next challenge for historians of technology will be to work on further enriching the field by building on this initiative. New generations of scholars will surely discover valuable ways to enlarge these European-based studies, with analysis of both center and periphery. Yet even more exciting potential rests in those geographic areas, periods, case studies, and transnational theoretical issues still underrepresented in the literature. Extending a similarly collaborative, intense approach to explore a full global history of technology could yield groundbreaking results for years. Anticipating this end, an ideal might be for this series to serve as a solid foundation, inspiring and modeling how scholars from different countries, generations, and backgrounds could connect to construct an ever-deeper, complex picture that places history of technology in a true world context. Meanwhile, these six volumes well deserve to claim a place as essential reading on the bookshelves of historians of technology in any country.

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