

EDITORIAL

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PREFACE

The present issue of *History of Science and Technology* (Vol. 15, Issue 2, 2025) brings together a wide-ranging collection of studies that illuminate the long-term dynamics of scientific knowledge, technological systems, and their social, cultural, and political entanglements. The contributions assembled here reflect the journal's enduring commitment to interdisciplinary scholarship and to the integration of diverse geographical, chronological, and methodological perspectives. Taken together, the articles demonstrate that science and technology are not isolated domains of technical ingenuity, but historically contingent processes shaped by imagination, institutions, power relations, material practices, and cultural values.

A unifying theme of this issue is the continuity between past and present: ancient myths and early mechanical devices resonate with contemporary debates on artificial intelligence; nineteenth-century academic networks prefigure modern systems of scientific communication; industrial technologies mature through decades of negotiation between laboratories, factories, and regulatory regimes; and cultural technologies such as music, cinema, and transport reveal deep interconnections between material innovation and human perception. By juxtaposing case studies from Europe, Asia, the Middle East, and Southeast Asia, this issue underscores the global character of scientific and technological development while remaining attentive to local contexts and specific historical trajectories.

The issue opens with Ahmed Shaker Alalaq's study "*Artificial Intelligence and Robotics in Ancient Times: Between Myth and Interpretation*", which explores how



ancient civilizations conceptualized artificial beings capable of thought and action. By examining myths such as Automata, the Golem, and other legendary constructs from Greek, Chinese, and Near Eastern traditions, the article demonstrates that the aspiration to create intelligent artifacts is not a product of the digital age alone. Rather, it is embedded in long-standing philosophical and cultural reflections on consciousness, creativity, and the boundaries of human agency. Alalaq's contribution situates contemporary debates on artificial intelligence within a *longue durée* perspective, showing how ethical concerns, fears of loss of control, and hopes for human enhancement were already articulated in mythological form. In doing so, the article provides a conceptual bridge between ancient imagination and modern technological realities, reminding readers that innovation is often guided by deeply rooted narratives and symbolic frameworks.

Several contributions in this issue focus on the nineteenth century as a formative period for modern scientific institutions and communication networks. Denys Buhor's article "*Development of Ukrainian Mechanics: Context of Scientific Publications by Kharkiv Scientists of the 19th Century*" offers a detailed historiographical and bibliometric analysis of the Kharkiv scientific milieu. By examining publications produced at Kharkiv University and the Kharkiv Institute of Technology, the study reveals how theoretical and applied mechanics developed in close institutional synergy. Figures such as Oleksandr Lyapunov and Volodymyr Steklov emerge not only as individual innovators but as representatives of scientific schools shaped by mentoring, academic heredity, and international exchange. Buhor's work highlights the transition from isolated scholarly efforts to systematic research cultures aligned with industrialization and European scientific standards.

Complementing this perspective, the article by Natalya Pasichnyk, Renat Rizhniak, and Hanna Deforz, "*International Relations and Scientific Communication of the Imperial Novorossiia University in the Last Third of the 19th Century*", examines the mechanisms through which Odesa scientists integrated into the European scientific space. Focusing on translations, academic mobility, participation in international congresses, and the role of the *Notes of the Novorossiia Society of Naturalists*, the authors demonstrate how multilingualism and institutional platforms facilitated knowledge circulation. This study underscores that scientific globalization in the nineteenth century was not a one-way transfer of ideas from Western Europe to the periphery, but a complex process of adaptation, negotiation, and mutual recognition.

The transition from scientific knowledge to industrial application is examined in Artemii Bernatskyi's article "*Hybrid Laser-Arc Welding of Low-Alloy Steels: From Scientific Concept to Industrial Technology (1970s–2020s)*". This contribution traces the four-decade trajectory of hybrid welding from laboratory experiments to its selective stabilization in sectors such as shipbuilding, pipeline construction, wind-energy infrastructure, and offshore engineering. By emphasizing institutional conservatism, certification barriers, and capital intensity, Bernatskyi shows that technological diffusion of innovations is rarely linear or inevitable. The article also

situates hybrid welding within contemporary sustainability debates, revealing how a technology originally developed for productivity gains later acquired environmental significance through reduced material consumption and extended service life of structures.

A cluster of articles addresses the socio-political dimensions of technology in architectural and infrastructural contexts. Bharoto Bharoto, Himasari Hanan, and Andry Widyowijatnoko, in *“Institutionalising Concrete Construction Technology: A Socio-Technical Formation of Modern Architecture in Indonesia”*, analyze how concrete became the dominant material of postcolonial Indonesian architecture. Drawing on social construction theory, the authors show that technological institutionalization unfolded differently under the Old Order and the New Order regimes, yet resulted in a durable socio-technical system that bridged ideological and economic transformations. This study contributes a valuable Global South perspective to Science and Technology Studies by demonstrating that modernity emerges through negotiated, context-specific processes rather than simple technological transfer.

Similarly, Hary Ganjar Budiman and colleagues explore colonial power relations in *“Colonial Technopolitics in the Dutch East Indies: A Study of Colonial Hydroelectric Power in Pamanoekan and Tjiasemlanden Plantation”*. By combining archival research with historical archaeology, the authors reveal how hydroelectric infrastructure functioned as an instrument of colonial technocracy. Hydropower stations are shown not merely as technical achievements, but as mechanisms for rendering nature calculable and for integrating local environments into global economic networks. The article foregrounds the concept of technopolitics, emphasizing that technology operates simultaneously as material infrastructure and as a means of governance.

Petra Hyklová’s contribution, *“Negotiating a Great Telescope: The Case of Czechoslovakia”*, offers a detailed reconstruction of the political, institutional, and personal negotiations surrounding the construction of the Ondřejov 2-m telescope. The article demonstrates that large scientific instruments are products of complex collaborations involving scientists, manufacturers, state administrations, and international partners. By highlighting the parallel development of similar telescopes in Czechoslovakia and Azerbaijan, Hyklová reveals how scientific ambitions intersected with Cold War politics, economic constraints, and long-term planning. The continued operation of these instruments today underscores the durability of such negotiated technological systems.

The cultural dimensions of technology are explored in the article *“Pneumatics, Acoustics and Digital Sound: The Organ in the History of Science and Technology”* by Olena Spolska and co-authors. Treating the organ as a long-lived technological system, the study traces its evolution from the ancient *hydraulis* to contemporary digital and hybrid instruments. The article demonstrates how advances in pneumatics, acoustics, metallurgy, electrification, and computation were gradually absorbed into organ building without erasing earlier traditions.

Transport history and the culture of speed form the focus of the next article *“The*

History of the Emergence, Development and Improvement of High-Speed Railways". By combining technical, socio-economic, and cultural analysis, the authors show how high-speed rail transformed perceptions of space and time while serving as a tool of regional integration and economic development. From the Shinkansen and TGV to contemporary maglev and Hyperloop concepts, high-speed rail emerges as a key component of twenty-first-century energy-intelligent mobility.

The issue concludes with the article "*Silent Cinema as a Technological System: Infrastructure, Innovation, and Institutionalization (1890–1930)*" by Liudmyla Vaniuha and colleagues. Challenging the view of silent cinema as a primitive precursor to sound film, the authors demonstrate that this period established the foundational technological and institutional structures of modern cinema. Projection systems, permanent theaters, studio infrastructures, special effects, and genre formation collectively transformed film into a global medium of mass communication. This study highlights cinema as a paradigmatic example of how technology, industry, and culture co-evolve.

Together, the articles in this issue of *History of Science and Technology* illustrate the richness and diversity of contemporary scholarship in the field. They reaffirm that the history of science and technology is best understood through interdisciplinary approaches that connect technical detail with social context, institutional frameworks, and cultural meaning. By bringing ancient myths into dialogue with artificial intelligence, colonial infrastructures with postcolonial modernity, and nineteenth-century scientific schools with global knowledge networks, this issue invites readers to reflect on the enduring and evolving relationship between humanity and its technologies.

We hope that this collection will stimulate further research, foster international dialogue, and contribute to a deeper understanding of science and technology as historical processes that continue to shape our present and future.

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