

The Material Construction of Socialist China: Technopolitics and Grassroots Agency at the Wuhan Yangtze River Bridge

Extended Abstract

1. Research Question

As a complex body politic, the construction of the modern state is the result of multiple practices. In existing political science and sociology scholarship, the state is often abstracted into organizational systems, power fields, or symbolic systems. Conversely, large-scale infrastructure projects unique to modern society—such as railways, steel bridges, and large dams, despite their profound impact on the social experience of modernity, have long been marginalized from the core of state theory.

The core question this study attempts to answer is: How does a nascent state power realize the construction of its national modernity through the material practices of large-scale national engineering? In particular, what roles do grassroots actors play in this process?

This paper takes the Wuhan Yangtze River Bridge, a key project during the First Five-Year Plan of the People's Republic of China, as its object of study. Rather than merely focusing on how the bridge enhanced national industrial capacity, this research investigates how the engineering process itself—through the interaction between materiality and technopolitics—manifested the trajectory of state-building in the early years of the PRC. Through an in-depth analysis of historical archives, contemporary reports, biographies, and related publications, this study aims to reveal how state power was extended through specific technical contestations, resource constraints, and interactions with the natural environment, ultimately achieving the materialization of “Socialist New China.”

2. Theoretical Context

At a theoretical level, this paper engages in dialogue with two strands of existing research:

2.1. The Material-Generativity of Modernity

Modernity has long been regarded as a homogeneous and top-down imposed blueprint. Particularly in discussions of socialist modernity, it is often reduced to a movement of fanatical political passion led by charismatic leaders. By introducing the concept of Materiality from the field of Science, Technology, and Society (STS), this paper attempts to argue that modernity is not a homogeneous physical translation, but a hybridly generated product of state will and local practice.

2.2. Integrating Organizational and Cultural Perspectives

Existing theories maintain an epistemological isolation between the state as an organizational system and the state as a symbolic system. By conceptualizing the state as a practice-based process, this paper seeks to bridge this divide, exploring how the state simultaneously develops its organizational apparatus and shapes its symbolic meaning system within the context of engineering practice.

3. Research Approach and Analytical Methods

This study employs an interpretative qualitative method to explore the construction of the Wuhan Yangtze River Bridge. Rather than focusing on instrumental causality or the external consequences of the project, this approach seeks to promote understanding by identifying the motives and social actions of the individuals involved. Central to this analysis is the reconstruction of the landscape of meaning. This methodological framework treats meaning as a generative power, examining how frontline actors interpreted and signified their labor, the engineering challenges, and the broader project to reconcile the contradictions between national blueprints and local realities

Complementing this is a rigorous archival method. The research is grounded in the analysis of primary historical materials, including official records from the Hubei Provincial Archives, internal reports, technical summaries, contemporary news coverage, and the biographies of key participants. A critical source of evidence is the construction site newsletter, *Gongdi Shenghuo* (Work-camp Life), along with the propaganda and educational files of the various bridge teams. By scrutinizing these micro-level archival records, the study reconstructs the specific, continuous interactions and translations performed by frontline cadres and technical experts on the ground.

4. Core Argument

The core empirical portion of this study revolves around technical choices and the interpretation of meaning during the construction of the Wuhan Yangtze River Bridge, specifically manifesting in a series of micro-level interactions concerning the tube-column drilling method.

4.1. Material and Technical Friction: From Caisson to Tube-column

The construction of the Wuhan Yangtze River Bridge faced extremely severe natural constraints, namely, the unique and harsh hydrological conditions of the Yangtze River. At that time, although the internationally common pneumatic caisson method was technically mature, the excessively high-water level of the Yangtze and the lack of skilled caisson workers in New China brought the traditional technical paradigm to a standstill. A senior Soviet technical official named Galaktionov suggested adopting the new tube-column drilling method, but the proposal was rejected by the Soviet Union because the technology had never been applied anywhere in the world; Galaktionov himself was subsequently demoted and recalled. However, by 1954, as construction progress became urgent, Galaktionov's student, Silin, took over as the technical advisor. Based on a trusted relationship with Peng Min, the Director of the Bridge Bureau and a former comrade-in-arms, Silin re-proposed attempting this new technology. This process demonstrates that major technical decisions are not simple optimizations of schemes, but are deeply embedded in the internal tensions of the Sino-Soviet alliance, China's urgent demand for rapid industrial achievement, and the interplay between interpersonal trust, resource constraints, and the natural environment in local practice .

4.2. Politicalization of Technical Disputes: Autonomy and Political Trade-offs

During the preliminary project (the Hanshui Railway Bridge), interactions surrounding technical issues already revealed the essence of technopolitics. Chen Changyan, the Chinese technical head, believed that the static load test had met standards according to British and American formulas, whereas the Soviet advisor, Oniskov, insisted on continued pile-driving based on Soviet formulas, leading to a severe conflict. Oniskov elevated this technical disagreement to a political issue of disobeying orders, reporting it directly to the Ministry of Railways and the Soviet General Bureau. Ultimately, to maintain the broader interest of international collaboration within the socialist camp, the Chinese government required Director Peng Min to write a self-criticism in the internal newsletter *Gongdi Shenghuo* (Work-camp Life) and ordered that “the advisor’s suggestions must be strictly executed, regardless of whether they are correct or not.” Although technical verification eventually proved the Chinese technicians’ judgment was correct, this instance illustrates how technical schemes were utilized as political leverage and how the nascent state sacrificed partial technical autonomy to maintain organizational consistency under specific international circumstances.

4.3. Ideological Translation of Technical Schemes: Peng Min’s “Socialist Labor Method”

The most enlightening discovery of this study is how grassroots actors achieve political legitimacy through the creative interpretation of technical schemes. When the world-first tube-column drilling method was finally adopted and successfully implemented, significantly shortening the construction period and overcoming natural obstacles, Peng Min, the head of the bridge project, did not merely describe it as a technical victory when reporting to Mao Zedong. Instead, he elevated it into a political symbol, labeling it the “Socialist Labor Method.” Peng attempted to argue for the scheme’s rationality to the top leadership by imbuing the technology with class attributes and institutional superiority. Although Mao Zedong corrected this view, stating that “labor methods are either scientific or unscientific, and cannot be divided into capitalist or socialist methods,” the existence of this translation mechanism profoundly reveals the agency of grassroots cadres. They consciously misappropriated and creatively transformed macro-ideological narratives to reconcile the contradiction between the state’s grand blueprints and local technical or resource constraints .

5. Conclusion

By focusing on the technopolitical interactions at the micro-level of the bridge project, this study reaches the following conclusions:

First, China’s socialist modernity was not a monolithic ideological imposition, but rather a hybrid product generated through the continuous interaction among the state’s grand goals, severe geographical constraints, and the pragmatic strategies of grassroots actors.

Second, Frontline cadres and technical experts at the construction site were not merely executors of a blueprint, but functioned as mediators. By translating technical schemes into ideological narratives and resolving technical disputes through organizational means, they successfully reconciled the tensions between state will, technical logic, and local knowledge.

Third, The construction of a modern state is, first and foremost, a process of material practice. Through engineering practices, the state not only monopolizes violence and symbolism but also successfully transforms abstract institutional superiority into a visible and perceptible material landscape through the successful control of the natural world (such as the conquest of the natural moat of the Yangtze River).

In summary, the Wuhan Yangtze River Bridge is not merely a physical bridge, but a dynamic technopolitical field. It was precisely through these specific, continuous technical interactions and political translations that frontline cadres and technical experts ultimately co-shaped the material landscape and national order of “Socialist New China.”