

## Commentary: New Directions in the Study of PRC-Era Science

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**Abstract** This essay offers commentary on the previous three articles regarding PRC-era science by Sarah Mellors, Chuan Xu, and Sigrid Schmalzer. It notes that by moving beyond older concerns that were centered on issues of state control or techno-nationalism, these articles exemplify new directions in the study of PRC-era science. Their focus on lived experience, local stories, and materiality provides rich and diverse perspectives on histories of science in the PRC by exposing the often contradictory ways in which the power and influence of science operated across society. The commentary concludes by identifying three pathways for future research.

**Keywords** PRC science · history of science · birth control · materiality · agriculture · sound

As I write this, the world sits on the anvil of 5G (fifth generation) mobile cellular technology. In the West, the moment is accompanied by a degree of consternation and, perhaps also, trepidation. The nation poised to take the lead in 5G technology is not the United States or any of the other usual suspects, but the People's Republic of China (Woyke 2018). Such discourse is reflective of a wider acknowledgement in the media of China's rise to prominence as a global leader in science and technology. Breathless news reports chronicle the planning of Chinese smart cities, the creation of biometric surveillance systems, the establishment of science and technology parks, investments in green and renewable technologies, and much else. Some have drawn links between the dynamism of the 1930s and the post-1978 years, painting the years in between—when China was primarily governed by Mao—as an aberration. The three essays in this volume serve as a timely reminder that such contemporary fixations come with risks. For starters, we run the risk of simply forgetting and thus ignoring scientific activity in Mao-era China. And even if we do not forget, we may still fall prey to normalizing such

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activity, flattening its complexity and diversity to suit narratives of the more recent years. The challenge, then, is twofold: how do we assess scientific activity during the years 1949 to 1978 on their own terms, and for the connections they have with developments, patterns, and paradigms that precede and follow them? The three essays here provide us with a glimpse of what is possible.

Studies of Mao-era science have come a long way in a very short period of time. Wendy Fu's historiographical essay in this volume provides a rigorous analysis of the state of the field and its evolution. Even so, the historiographical context within which these three pieces have emerged bears some reflection and I note here a few important antecedents. The year 2007 witnessed the publication of two important journal special issues. The first appeared in the *China Quarterly*, where Julia Strauss pointed out that the burden of scholarship on the Mao era, aided in no small measure by the expansion in archival access, had expanded to include historians (Strauss 2007). The second was an *Isis* special issue dedicated to the history of science in modern China (*Isis* 2007). Benjamin Elman (2007: 517) began his introductory essay to the volume by noting "It is remarkable how little we know about modern science in contemporary China." It was, however, Zuoyue Wang's essay in the same volume that directly addressed studies of post-1949 science (Wang 2007). Wang explained that, although lively, most of the scholarship up to that point had focused on questions of state control and "techno-nationalism." Under the circumstances, many Chinese historians of science preferred to work on histories of individual scientists, disciplines, and institutions—all relatively safe subjects. Noting that the field was expanding rapidly, Wang expressed hope that future work would be more effective in deconstructing and moving beyond the state and its agendas. In the years since, many of these hopes have indeed been met, if not fully addressed, within the broader field of PRC history. Most notably, in 2015, Jeremy Brown and Matthew Johnson (2015) edited a book of essays that self-consciously sought to bracket the state and focus instead on the everyday experiences of Maoism.

The three essays under discussion here exemplify the evolution of these trends within the study of Mao-era science. Sarah Mellors's essay on birth control during the early PRC is notable for two important historiographical shifts. The first is temporal; by focusing on the first decade of the PRC, Mellors urges us to broaden our lens and look beyond the design and execution of the one-child policy from 1979 onward. The second is a shift away from discourse analysis and top-down implementation—a feature of earlier scholarship on 1950s birth control—toward what she calls the "lived experience of birth control use." Using a combination of interviews and archival sources, she demonstrates that not only was literature on birth control and abortion widely available, but also that the information within this literature varied greatly and was often inconsistent and confusing. Beyond questions of popular knowledge, Mellors also provides a richly layered depiction of the materiality of contraceptive devices (cervical caps, condoms, ointment, suppositories, vaginal plugs), and associated procedures (sterilization, acupuncture point method, consuming tadpoles, etc.) and explains how their accessibility was mediated by class, gender, age, and geography. Mellors's article thus provides a historiographically erudite and nuanced engagement with "the manufacture and materiality of contraceptive devices and the micro-politics of their use," bridging the gap between discourse and practice (Ghosh 2017: 719).

An emphasis on lived experiences, which we could also call *local* or *grassroots* experiences, and the materiality of objects that inform such experiences is also a feature

of Chuan Xu's essay. By tracing the history of magnetic recording Xu demonstrates the central role that recorded sound played in Mao-era governance practices. Temporally, he picks up right where Mellors stops, in 1958, and takes us into the 1980s, tracing important changes across the 1978 transition. Informed by STS and media studies, Xu draws our attention to nodes, networks, and the propaganda officials and recording devices (such as the L601 Open-Reel Recorder) that populated them. During the Mao era, the hierarchy of sound infrastructure reflected a hierarchy of authority and control, with little choice for the ordinary listener, who remained far removed from those that produced the recordings. As late as 1981, one billion people relied on a mere two million magnetic recorders and possibly an even smaller number of people with the authority to make recordings. The concurrent proliferation of compact cassette tapes, however, brought dramatic changes. Nodes were no longer radio stations or propaganda officials, but ordinary people. And even as access to devices proliferated, tinkering played an essential role, allowing people to dub and create individualized collections that could then be reproduced and circulated further. This moment of "hooligan" proliferation, to use Xu's term, is evocative of the popularity of pirate radio in 1960s Britain, when the BBC refused to air pop and rock music.

One of Xu's central methodological suggestions is that we avoid both technological and social determinism and explore instead their entanglement. Entanglement is also central to Sigrid Schmalzer's essay on agricultural terracing in the Mao era and today. As Schmalzer explains, it remains important to recognize that technical knowledge is embedded in culture. As Chinese scientists and scholars have sought to participate in a global movement to preserve agricultural heritage, they have consciously undermined the Mao-era valorization of mass experience and replaced it with a more primordial (and static) emphasis on culture and tradition. Schmalzer's treatment of experience thus differs from both Mellors's and Xu's. For her, experience is not a mode of analysis but rather the object of analysis itself. As she notes, the Mao-era version of experience itself needs to be understood in the context of earlier debates between experience and theory, most notably in early twentieth-century medicine, as marking out competing realms of authority that corresponded, respectively, to China and the West. Schmalzer does not view the Mao-era valorization of experience with rose-colored glasses, pointing out that although it was a powerful tool to promote class consciousness, it also involved an inability to acknowledge the actual diversity of local knowledge practices and their cultural contexts. She also reveals that the more recent promotion of culture ignores Mao-era innovations such as technology extension stations, use of models and exemplary sites, and the dissemination of printed materials. Her essay thus makes explicit that contemporary practices are not so much forgetting scientific activity of the Mao era but instead actively reducing its complexity to fit global trends and nationalist agendas.

Although they cover diverse subject matter and are informed by overlapping but different conceptual concerns, the three essays possess interesting thematic and methodological connections. Together, they make a strong case for focusing on local experiences, not as a celebration of particularity, but for providing the grounds to deconstruct easy state-centric or nation-centric narratives about science. Only by such attention to local concerns—tracing the interaction of officials, workers, ordinary people—can we disentangle what Schmalzer calls the layered history of knowledge

production and circulation.<sup>1</sup> Attention to materiality, broadly construed, is also central for such an endeavor and in these essays we encounter a wide range of materials: magnetic recorders, cassette tapes, birth control devices, books, and not least, soil, rocks, and water. They help us think about entanglement not only across fundamentally human categories (science/society, science/culture, or science/state) but also across human and nonhuman categories.

The essays also help us approach the question of periodization in interesting ways. Mellors's essay makes the case for the importance of the 1950s, providing a periodization internal to the Mao era, but one whose legacy, she argues, is relevant not just for later decades of the Mao era but also the 1980s and beyond. In contrast, Xu's story bridges 1978, noting how the sound regime was transformed by the 1980s. Schmalzer's essay draws interesting conceptual connections about knowledge production and propagation that span the entire century, but makes a particular case for the salience of categories that were especially dominant from 1949 to 1978.

Finally, it can also be instructive to read the three articles as contrasting case studies about the power and influence of science in post-1949 Chinese society. Mellors's case of birth control knowledge, policies, and practices provides historical context and antecedents for the unprecedented expansion in power, control, and intrusion that was symbolized by the one-child policy a few decades later. As she explains, the "1950s marked the beginning of a slow and messy transition from haphazard, unsystematic regulation of reproduction to the near-hegemonic population control of the one-child policy era." Xu's story of sonic control presents the reverse process. What was a highly regulated structure of sonic production and dissemination unraveled rapidly in the early 1980s with the proliferation of cassette tapes (15 million in 1980 alone; a five-fold increase from 1970) and recorders, fueling fears of social, moral, and ideological downfall. This transition is neatly captured in Xu's use of the twin tropes of the sonic model and the sonic hooligan. The transition also suggests a complete transformation of the temporality of sonic experience. A system with its own rhythms and periodicity, with time set aside for recordings to be physically transported to far-off sites, was overwhelmed with ease as the alluring voice of Teresa Teng could be dubbed onto cassette tapes and shared immediately. While Mellors and Xu give us examples of accentuation and unraveling, Schmalzer's story of agricultural terracing is one of repurposing. Epistemological assumptions about what constituted knowledge had to be changed so that extant agricultural practices, many of which were innovations of the Mao era, could be repurposed to fit a narrative of long-standing cultural practice that would appeal to both global conservation and global capital. Together, the three essays thus help us understand the power of science—accentuated, unraveled, repurposed—while avoiding the trap of reductive state-centric narratives.

Essays as generative as these invite speculation on future directions. Let me end by identifying what I see as three promising and exciting future pathways. The first of

<sup>1</sup> This tension between local and grassroots histories, on the one hand, and the paradigms and frameworks put forward by an earlier generation of primarily social scientists, on the other, is at the heart of contemporary debates about the purpose and burdens of PRC history. Liz Perry (2016: 114) notes, for instance, that the "reticence on the part of the current generation of historians to advance overarching historical arguments about the enduring influence of that period is regrettable." A forthcoming issue of *Positions: Asia Critique* is dedicated to exploring these tensions.

these ought to be self-evident, because it features in each of the essays: the environment. In her essay, Schmalzer acknowledges the strong role that changing notions surrounding the environment have played, highlighting how the case of Wangjinzhuang is therefore useful to understand not just environmental destruction and conservation, but also the multiple, layered meanings these terms may have at different points in time. Environmental implications are also present in Mellors's discussion of the production and use of various devices, most notably the importation of cocoa butter, gelatin, and quinine, and the consumption of tadpoles. The production of condoms and diaphragms, made usually of rubber, also invites questions of plantations, sourcing, and biodegradation. In contrast to both Schmalzer and Mellors, Xu's essay provides a nonmaterial window into questions surrounding the environment of different soundscapes and, intriguingly, sound pollution.

The international connections outlined in each essay—transnational movements, importing of raw materials or technologies, and so on—are relevant in at least two ways. They first point to the importance of socialist networks. Was there a broader world of socialist science that these practices fit into? At the state level, much work has been done to map socialist bloc networks. The approaches taken by these three essays suggest that interesting comparative and connective insights might emerge were we to look for them. Two recent workshops suggest that the field is indeed moving in this direction. In 2016 Columbia hosted a workshop on circuits of expertise across the socialist world post-1945, consciously bringing together two communities that rarely interact: scholars of Eastern Europe and of Asia (Nguyen 2016). And last November, Aaron Moore and Jennifer Altehenger organized the workshop “How Maoism Was Made,” whose participants included not just China experts, but also scholars of the former Soviet Union, again with the aim of thinking comparatively and conceptually across the socialist world.

A similar hope can also be expressed for networks that span the Third World or the Global South. Here again, the trend is promising. The inaugural volume of the *British Journal for the History of Science—Themes* was devoted to science and technology in twentieth-century China and India, carrying essays that explored a range of issues in comparative and connected terms (Phalkey and Lam 2016). For some years now, the Social Science Research Council's InterAsia Program has offered fellowships, organized workshops, and built communities that are exposing the “limitations of the Asia construct by promoting frameworks and concepts for a new generation of scholarship that reconceptualizes Asia as a dynamic and interconnected formation.” And as I write, Columbia is hosting the workshop “Science and Society in Global Asia.”

As work in these three areas continues to expand, we shall hopefully arrive at insights that will inform not just our understanding of science in China but also of twentieth-century science more broadly.

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