***How Cotton Became “Chinese”: Seeds, Science, and Local Society in Twentieth Century China***

Proposal to Yale University Press

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Overview:

How did China become one of the global leaders in cotton production and manufacturing by the 1980s? This achievement would’ve seemed unthinkable to many a half century earlier as surveyors criticized the quality and quantity of local produced. During a 1919 tour, for example, scientists from the United States Department of Agriculture (USDA) described China’s cotton as “degenerate” with existing scientific institutions too incompetent to even distinguish between different species of cotton. China’s overall output of cotton was minimal compared to the US South and only a small percentage of this was even suitable for industrial factories. And yet, by the end of the twentieth century, China’s place in the global cotton economy was secured. In 1984, China grew over twice as much cotton as the US, comprising an astounding 34.4 percent of global cotton production. Its place within the global economy and scientific community has only increased in recent decades. Symbolic of its global standing, in January 2019 China’s lunar lander Chang’e 4 took a cotton seed to the far side of the moon in a climate-controlled container where it sprouted and grew for a short time. That the small cotton sprout quickly succumbed to the harsh environment didn’t prevent some cotton scientists from enthusiastically celebrating the versatility of Chinese cotton. Once deemed “degenerate,” cotton cultivated in China can now be found all around us in our clothing and furniture to packaging and coffee filters. While China might be a subplot to the history of cotton prior to the twentieth century, it has risen to be one of the major actors in over the past century.

As described in this book, the story of China’s rise to dominate the global cotton economy is both highly transnational and deeply local. The history of cotton is inevitably connected to transnational economies, supply chains, scientific communities, and biological organisms. Rising labor costs in the United States and Europe led manufacturers to look to the Global South for cheap labor, including China where foreign and local companies began establishing cotton mills in the late nineteenth century. Foreign “experts” were recruited to serve as advisors while Chinese industrialists and agronomists traveled abroad to be trained in the science of cotton production and manufacturing. But the “Chinese cotton” that was then being grown throughout the countryside for household consumption was too short and weak to be processed using newly imported machinery. To resolve this problem, a growing force of cotton experts imported large quantities of American upland cotton and drew from foreign blueprints to distribute, grow, and market the cotton for industrial production.

Ambitious plans to grow large quantities of upland cotton were confronted with the realities of the Chinese countryside. Imported cotton struggled to thrive in their new environments and local farmers weren’t always eager to adopt new crop regimes. Cotton experts responded by setting up regional experiment stations to localize foreign seeds and breed new varieties for local distribution. And new social institutions were introduced at the local level to limit the varieties of cotton in circulation and control the flow of seeds and raw cotton. Throughout the twentieth century, cotton experts struggled alongside political regimes in reshaping the countryside to serve scientific and industrial needs.

To bridge the local and transnational, I propose a seed-centered approach to history. In doing so, it not only highlights the global circulation of seeds and information about them, but also how attempts to understand and control seeds resulted in significant social, political, and economic changes at the local level. Seeds have been significant forces of historical change. Their circulation has facilitated economic growth, ecological change, and social catastrophe. The nature of how seeds and plants reproduce has provided both an opportunity and an obstacle for economic growth. Producing large quantities of uniform crops requires a package of technologies that might include experiment stations, extension agents, production facilities, and marketing networks. As such, producing raw cotton to feed China’s growing factories in the early twentieth century necessitated the growth of scientific research communities and institutions. It required these scientists to remake seeds to suit local environmental conditions. And it relied on political/economic agents to rework local production and marketing networks in the name of preserving seed purity and promoting cotton industrialization. This book is at its core a history of these efforts and how science, economy, politics, and local society became entangled as China rose to become a global leader in cotton production.

Chapter Summaries:

This book argues that China’s rise to dominate global cotton production by the 1980s must be seen within a longer history of institution and capacity building dating back to at least the 1920s. In **Chapter 1**, I outline early efforts in the late nineteenth and early twentieth centuries to introduce large quantities of American cotton seeds to China. These early efforts to fuel China’s growing textile factories were sporadic and unsustainable as industrialists and government officials were unable to maintain control over the seed supply. Seeds were widely distributed and quickly mixed with other types of cotton. A growing coalition of cotton industrialists and scientists in the 1910s worked to resolve this problem and looked to the United States as a model. In 1919, they invited Orator Fuller Cook from the U.S. Department of Agriculture to visit China and survey its main cotton regions. Cook saw in China many of the same problems that the US cotton economy faced following the US Civil War. He subsequently proscribed what was known as the “one-variety community movement”, emphasizing the centrality of community production wherein all farmers within a given region are only allowed to grow and process a single variety of cotton to maintain seed “purity” (i.e. uniformity).

**Chapter 2** picks up following Cook’s visit to explore how the idea of seed purity and community production was discussed and implemented in China from 1920 to 1937. Chinese scientists drew from Cook’s model to draw up nation-wide blueprints for cotton reform that included the consolidation of experiment stations, establishment of extension centers, and overhauling existing economic networks. While the blueprints in the 1920s failed to materialize in any meaningful way, they did shape cotton improvement work in the 1930s. By adopting a “special history” approach, this chapter provides a revision of existing scholarship emphasizing the limited impact of science on the agricultural economy. Instead of only looking at one or two experiment stations, this chapter argues that the combined efforts of dozens of improvement stations had a much larger overall impact than previously assumed. In short, the implementation of one variety communities appears to have helped certain regions overcome the negative impacts of the global great depression in the 1930s.

Japan’s full-scale invasion of China in 1937 brought much of this work to a halt, but it also contributed to a further centralization of scientific and technological research as shown in **Chapter 3**. Japan’s invasion cut off the Nationalist government’s access to the vast majority of China’s cotton fields. Settled in its wartime capital of Chongqing, the Nationalist’s home front produced a mere 10 percent of annual cotton pre-1937, the majority of which was grown in the northwestern province of Shaanxi. Wartime demands for cotton and foodstuff helped solidify a form of “state science” where a greater number of experts and resources were managed directly by government-led institutions. Such trends predated the war, but the demand for resources and the concentration of scientists in a more contained region extended the effective reach of the state, allowing scientists to realize on a regional level what they had originally envisioned for the entire nation.

**Chapter 4** explores how scientists adapted to the new political environment of the People’s Republic of China (1949- ), and how the new political system allowed cotton scientists and political leaders to realize their vision of establishing one-variety cotton communities at scale. Most cotton scientists remained in China after 1949 and were able to contribute to ongoing discourse about cotton improvement, an example of how pre-1949 institution and capacity building helped shape the early PRC. I look specifically at how pre-established US-China networks allowed for scientists to continue importing seeds into the early 1950s, how seeds were shipped to experiment stations and bred for dissemination, then how seeds and raw cotton were managed through local cooperatives and production teams. The blending of new and old systems was so effective that a single variety of American cotton imported in 1950 was being grown on roughly 60 percent of China’s cotton fields by 1958.

Science, technology, and politics were increasingly intertwined in 1960s and 1970s due to fallout from the Great Leap Forward and the Cultural Revolution. **Chapter 5** explores this time through the lens of how cotton scientists at several research centers experienced political upheaval. Experimentation persisted even if it had to adapt to the times. As this chapter demonstrates, seeds bred in private stations such as the Shandong Academy of Agricultural Sciences proved crucial to rapid increases in yields by the late 1970s and 1980s. **Chapter 6** documents China’s global rise in the 1980s to 2000s, ending with its changing landscape as cotton production has shifted almost entirely westward to Xinjiang.

Tentative Table of Contents and Schedule

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|  | Title | Words | Status/Schedule |
| Frontmatter |  | 1,000  |  |
| Introduction |  | 5,000 | write: Jan/Mar 2025 |
| Chapter 1 | Foreign Cotton Craze: Upland Cotton and the Beginnings of Cotton Science, 1900-1920 | 10,000 | draft complete |
| Chapter 2 | Preaching Purity and Early One-Variety Communities, 1920-1937 | 10,000 | draft complete |
| Chapter 3 | The Fabric of War: Cotton in Wartime China, 1937-1949 | 10,000 | draft complete |
| Chapter 4 | Seeds of Revolution: Scaling Cotton Improvement in the 1950s | 10,000 | partial draft,write: June/July 2024 |
| Chapter 5 | Breeding the Future during Political Revolution, 1960s-1970s | 10,000 | research complete, write: July/Aug 2024 |
| Chapter 6 | Making Cotton Chinese: China’s Global Rise, 1980-2000 | 10,000 | research complete, write: Sept/Dec 2024 |
| Conclusion |  | 5,000 | Write: Jan/Mar 2025 |
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**Competitive Analysis:**

Cotton as a subject of historical analysis has received increased attention in recent years. Works such as Sven Beckert’s *Empire of Cotton* and Giorgio Riello’s *Cotton: The Fabric that made the Modern World* have provided a productive framework and natural audience for works on cotton that lie at the intersection of political economy, material culture, empire, and science and technology. Such works provide a natural audience for my book as these studies only deal with China in passing. Moreover, while there exist a handful of books on the history of cotton in China, most tend to focus on a more narrow timeframe or one particular aspect of the cotton economy. Jacob Eyferth’s forthcoming book on the rural cotton economy in Shaanxi province provides meticulous detail about one region in the 1950s. Yuan Yi’s recent dissertation focuses primarily on cotton textile factories in the late nineteenth and early twentieth centuries. Other existing books on cotton by scholars such as Elizabeth Koll and Bjorn Alpermann similarly focus on specific timeframes and regions. This work differs from them in my focus on larger-scale transformations that took place across the twentieth century. It also places agricultural science and cotton seeds at the center of this history, demonstrating the interconnectedness of the countryside to the process of industrialization.

**About the Author**

Spencer Dean Stewart is an Assistant Professor of History and Digital Humanities at Purdue University. Before joining Purdue, he completed his PhD in modern Chinese history from the University of Chicago in 2022 and was a postdoctoral fellow with the D. Kim Foundation for the History of Science and Technology in East Asia. He works at the intersection of agricultural history, the history of science and technology, and the digital humanities. His research has been funded by the National Science Foundation, Fullbright, Henry Luce/ACLS program in China Studies, the National Central Library (Taiwan), the Esherick-Ye Family Foundation, and the Economic History Association. As a part of conducting research for this book, Spencer spent over two years doing archival research and fieldwork in China and Taiwan where he visited over 20 different archives and interviewed dozens of retired cotton scientists. His research on Chinese agricultural science has appeared in *Twentieth-Century China* and *Agricultural History*.

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