Underground Empires: German Imperialism and the Rise of Modern Geology in China, 1860-1919

Shellen Xiao Wu

In my dissertation, I examine how science and technology served both empire building and Chinese resistance in the late nineteenth century and early twentieth century through the lens of geology and its practical applications in mining. In the period of my dissertation, reformist factions in the Qing state began purchasing large amounts of steel, centrifugal pumps, railway wagons, surveying materials and other industrial products from abroad in an effort to acquire the essence of Western wealth and power. At the same time, Germany began aggressively pursuing an overseas empire, and German industry increasingly challenged British economic dominance in China. In sum, my dissertation reassesses the role of imperialism in modern Chinese history through the perspective of science and technological transfer. By focusing on the technically skilled men who served empire across the globe, my dissertation is both world history and transnational history, solidly based in modern German and Chinese history.

I move my narrative of imperialism and science in China from the well-studied coastal treaty ports to the interior of the country. Well before the Japanese set up the puppet state of Manchukuo, the German colonial government saw the need for an infrastructure of transportation and industry, supported by large-scale, mechanized coalmines. Germany’s establishment of mining rights in Shandong Province set off French attempts for similar rights in Yunnan Province to the Southwest, British demands in Sichuan Province and Weihaiwei Harbor, and Russian and Japanese demands in Manchuria. For the Chinese the need to appease European pressure competed against a grassroots gentry protest movement. By 1910, the Qing state successfully reclaimed sovereignty over mining rights. The foundation of modern geological sciences in China in the nineteenth century coincided with government-sponsored attempts at industrialization and played out on the ground over competition for mining rights.

My research began with the German geographer Ferdinand von Richthofen’s expeditions in China, 1868-1872. Richthofen’s work in China not only established his academic reputation in Europe but also marked the beginning of three decades of German interest in China, which finally culminated in the takeover of Jiaozhou in Shandong Province. However, the bulk of the advance work for the German colony in China was performed by engineers and other technically skilled men. I proceed from Richthofen to look at the secret German Foreign Ministry program to plant engineers in Chinese industries with the goal of furthering German business causes.

Most works on the topic of German imperialism focus on cultural influence and the attempts of the colonial government to exert hegemonic control over the Chinese populace. I place my emphasis on technology and science and argue that German engineers played a similar role in China as did British technicians in continental European industrialization of a century earlier. However, Western imperialism in China complicated the transfer of science and technology. The German engineers who began working for the Chinese transitioned easily when Germany acquired a leasehold in Shandong Province in 1898. For these men the expanding European empires of the nineteenth century provided opportunities for adventure, career advancement and higher incomes, as well as considerable risks.

I also examine missionary translations of geology texts in the nineteenth century. In the act of translation, the issues of creationism, geological time, and evolution became further entangled with the role of science in imperialism and the wealth and power of the West. The reasons why these early translations fell into obscurity reveal a great deal about how the concerns of the original authors and translators mismatched Chinese needs. I argue
that the nineteenth-century missionary translations of science in the treaty ports tell only a small part of the story. In the West as well as China the divisions between science and technology, professional and amateur, were frequently blurred in the nineteenth century. In fact, much of the real transmission of geology and mining sciences occurred in the Chinese interior, in the large-scale modern enterprises opened by Li Hongzhang and Zhang Zhidong.

Finally, I look at how Chinese views of geology and mining changed over the course of the nineteenth century. In chapter six, I examine two German mining companies in Shandong during the colonial period (1898-1914) and the Chinese response to the foreign scramble for mining concessions. The Chinese promulgation of mining regulations, based on Japanese and European precedents, suggests that by the last years of the Qing dynasty, they had joined the ranks of nations that viewed mineral resources as the key to wealth and power. Moreover, after 1905, student protests and provincial attempts to buy back mining concessions effectively countered foreign demands.