

Technology Transfer in Early Twentieth-Century East Asia:
Thoughts for a Comparative Research Project

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Professor Brown's current research in Taiwan is part of a broader project that examines changing approaches to dealing with the risk of floods and landslides in Japan and East Asia over the 19th and 20th centuries. Efforts to deal with these hazards fall into two broad categories, restricting human activities in areas subject to floods and landslides, or deliberately altering the environment and landscape through human engineering. Professor Brown's most recent book employed traditional historical analysis along with GIS to explore one variant of the former, a system of Japanese landholding called *warichi* 割地, a system of land tenures that gave each cultivator an identically structured portfolio of cultivation rights which spread environmental and cultivation risk equally among cultivators.

Professor Brown's current research explores efforts to re-engineer nature as a means of reducing damage to human life and property, a process that employed new technologies, some developed in the West, to ameliorate flood and landslide risk. Such efforts have not attracted historians' attention and the history of technology in East Asia in the 19th century remains limited. As it is, the history of technology primarily emphasizes the development of new technologies in the West and the transfer of those technologies among Western nations. Secondly, another thread explores new developments which enabled conquest of distant lands -- Imperialism. A consequence of these conquests was the movement of Western technologies into colonial settings. English language studies treat this process, including development of railroads and the engineering of dams, especially in British-controlled India. Nonetheless, these movements represent only one part of the influence of Imperialism on technological transfer.

There are two important problems with this perspective.

1. Even technologies that are not new, when used in new ways or introduced into new environments can have major impacts.
2. Not all modern imperialists were Western.

Regarding the former issue, David Edgerton's *The Shock of the Old* has had a major role in drawing attention to the importance of studying the post-invention history of

technology. He shows, for example, the ways in which old technologies, abandoned in U.S. slaughterhouses, transformed the Brazilian beef industry.

Regarding the second point, while English language studies leave the impression that Imperialism was entirely Western, but as the people of Taiwan, China and Korea know well, that was not the case. In East Asia, the role of Imperialist was quintessentially filled by Japan, not a European nation. As a nation with its own program of economic diversification and technological development, Japan, too, had the potential to introduce new technologies into its colonial territories. That potential included the possibility of introducing new water and flood control mechanisms into its subject territories.

Of course, Japan's position as an agent of technological transfer in the early 20th century was rather awkward, especially in relationship to those technologies associated with construction of large civil engineering projects such as dams. Before Japan could export these technologies, it had to either develop them on their own, or import them. The involvement of one Japanese engineer, Aoyama Akira, whose experience working on the Panama Canal brought new approaches to actual civil engineering project such as the Iwabuchi diversion gate in Tokyo. Projects like Iwabuchi, and the later Okotsu Diversion Channel, suggest not only rapid advances in Japanese industrialization and implementation of modern construction technology, but also the limitations of progress to date.

How do all of these factors come together to shape Japan's role as a purveyor of technology in its own colonial territories? To what degree does Japan repeat the pattern of European imperialist enterprises? To what degree does the pattern of technology transfer in the Japanese Empire follow a distinctive course? Do former colonies assess Japan's role in "developing" their economies in ways that parallel assessments of former European colonies of the role of their former overlords?

These are large questions, and my current project represents a small start on exploring these and related issues. As start, Professor Brown is exploring two civil engineering projects, one in Taiwan, and one in northeast China. The former project, the Wushantou project and its related endeavors, began in 1920 and was completed ten years later. The latter, the Fengman Dam, was begun in 1937, and while water passed through it by early spring, 1943. Nonetheless, the dam was not completed by war's end. Kuomintang leadership could not advance the project and it remained for the PRC to recover from Russian capture of the dam's turbines and complete the dam. Each dam, at the start of its construction, was the largest civil engineering project in East Asia.

The two projects are interesting from several standpoints. First, they provide a

measure of the degree to which heavy engineering technologies were a) managed by Japan and b) produced in Japan. Japan's progress in industrialization up to the 1920s had been highly evaluated, but there were limits evident. How were these revealed in these projects? Did the wartime circumstances surrounding the Fengman project influence its construction or its quality relative to work in Taiwan and Japan?

Second, and in many ways the question that drew me into this comparison, why have Chinese and Taiwanese reactions to these two projects been so different? The architect of the Wushantou project, Hatta Yoichi, has been lionized in Taiwan, while the Fengman project is treated as the epitome of worst aspects of the Japanese occupation of China's northeast. When did these different assessments of these projects develop?

Was animosity present in Taiwan at first, and if so, when did people begin to evaluate the project more positively? What were the attitudes of Taiwanese toward the Japanese during construction? Does a positive evaluation only take place only after the end of World War II? Even if post-war, was such a reaction a function of the relations between the PRC and the ROC? Does the opening of relations between the US and China mark a turning point?

Conversely, my limited explorations of the Fengman project suggest additional interesting perspectives. The questions of Chinese reactions to the project during construction are as important as they are for Wushantou, but the on-set of full-scale war by 1941 created new circumstances for construction: Did labor conditions change? If so, did that have an impact on quality of construction? Did wartime circumstances create resentment in the 1940s that survived the war's end into the re-assertion of Kuomintang control? Were such assessments similar to the critiques offered by the new PRC regime beginning in 1949, critiques that continue to be found in Chinese publications? Sharp public critiques to the contrary, there are some indications that residents are not particularly concerned about the past. Are such responses just indicators of a dulling of oft-repeated political lines?

Third, what were the environmental impacts of these two projects? In both cases, transformation of the environment was an objective, limiting floods and providing irrigation waters chief among them. The Wushantou project also sought to stem salinization of lowland areas and improve agricultural productivity. Yet we may also ask whether, beyond these intended consequences, there were less fortunate, unintended consequences.

In sum, Professor Brown's interests in the Wushantou and Fengman projects spans the history of technology and environmental history over the twentieth century.