Most social and economic historians of early modern China, myself included, would probably agree on the general absence of basic technological innovation in the era of “early modern” China. The historiography, indeed, has concentrated far less on whether such innovation occurred than on the reasons for its absence. At one point it was fashionable to adduce cultural explanations – Confucian reverence for inherited practice, Chinese family structures, and so on – but these are for the most part no longer credited. Economic or ecological explanations now find greater favor. One of the most ambitious proponents of such views, Mark Elvin, advanced in the 1970s the notion of a “high-level equilibrium trap,” arguing that, by the late imperial era, the Chinese economy had succeeded in squeezing the maximum degree of productivity out of its pre-industrial economy, and spent this product on population growth, so that the short-term losses in productivity entailed in a shift to a more advanced level of basic technology seemed too great a cost to justify innovative change. Elvin has recently reformulated this idea as a process of “technological lock-in,” arguing that, by the eighteenth century, the maintenance of the empire’s productive ecology, above all the hydraulic infrastructure of irrigated agriculture, demanded all available resources, so that the cost of reinvesting these resources in new technology would have led to unacceptable losses in production and social stability.

Even if historians largely agree that little basic technological change occurred, nevertheless, they also mostly agree that China’s early modern
era was characterized by an intensive process of dissemination of those technologies considered superior from one region or sector of the empire to others. A number of channels facilitated this technological transfer. In my article I want to consider various general channels of transmission and their importance within premodern China, specifically (1) dissemination by government officials, (2) dissemination by mercantile diasporas, (3) written transmission in publications by the government or by quasi-official literati, and (4) written diffusion via the booming commercial publishing industry. I will then turn to several factors that might have served to restrict this transmission – though, as we shall see, I am less convinced on this score – including (1) attempts to legally protect intellectual property rights, (2) efforts by local communities, firms, and guilds to control trade secrets, and (3) efforts at professionalization within specialized occupations.

Agents of Transmission: Governmental Officials and Merchants

By comparison with the contemporaneous experience at the western end of the Eurasian continent, politically divided as it was into seigniorial domains and compact national states, dissemination of the best available or best suitable technology throughout the vast yet bureaucratically centralized Ming and Qing empires was far more often the deliberate product of activist local and regional officials. Field administrators, regularly rotated among jurisdictions and serving by law far from their native places (in most instances more technologically developed than the areas to which they were posted, because the prosperous regions brought forth more candidates than they could hold), routinely conducted campaigns to “improve agriculture” and upgrade existing hydraulic infrastructures. Perhaps the classic example of this was the strain of early-ripening Champa rice, whose shorter sixty-day maturation period made possible the introduction of rice cultivation into new areas, and the double-cropping of existing rice-growing regions, in turn facilitating the rapid population growth of the late imperial era. Introduced from Southeast Asia to coastal Fujian some time during the first millennium C.E., and from Fujian to the Yangzi delta in the eleventh century, Ming field officials were largely responsible for its further dissemination throughout the Yangzi valley up to Sichuan and into southern portions of the North China plain in the sixteenth century.

Something similar happened with the introduction of those later great facilitators of China’s modern population growth, the hearty and relatively drought resistant New World staple crops – peanut, sweet potato, and maize. According to Ping-ti Ho, the peanut and the sweet potato were first brought