“A MIRACLE BEAN”: HOW SOY CONQUERED THE WEST, 1909–1950

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In 1925, Japanese-American journalist Kinnosuké Adachi extolled the virtues of the soybean, describing it as a “miracle bean,” and its relatively short history in the West as a “wonder tale.” This insight was motivated in a utilitarian sense by the myriad uses of soy, but also by the astonishingly favorable reception the crop had received in the West during the first part of the twentieth century. In only a short period of time, the soybean would fundamentally transform agriculture and industry in both Asia and the West—a transformative process that this essay will seek to elucidate. I will argue that increasing demand for soy effected an economic and cultural transformation, the consequences of which were simultaneously global and asymmetrical. Indeed, the increasingly important role of soy in a global economic context—varying in use from East to West—led to the perception of soy as an irreplaceable all-purpose plant, fostering and influencing the creation of conceptions, imaginations, and images. It is the goal of this essay to investigate and expose these asymmetries between economic meaning and cultural perception.

At the turn of the twentieth century, Europeans and North Americans knew of the soybean only within the context of botanical gardens and agricultural experimentation; soy was far from being a cultivated crop with wide-reaching economic potential. The demand for soy first established itself with the shortage of vegetable fats and oils in 1908/09. For precisely the same reason, soybean demand would increase exponentially during the First World War, ushering in a comparatively late recognition of the crop’s agricultural and industrial value in the West. In the globalized world of the early twentieth century, crops such as cotton, vanilla, coffee, hemp, sugar, cocoa, and rubber had long been cultivated on a tremendous scale in colonial regions of the globe to satisfy Western hunger for raw materials. Soy did finally gain entry into the frame of Western consumption because of its versatile oil. Soy oil began to be used in the manufacture of soap, margarine, dyes, waterproof materials, candles, and other industrial products. Indeed, it was a byproduct of the oil-harvesting process—the production of so-called bean

cake—that brought the soybean to the center of attention. This protein-rich cake proved ideal as animal feed, admitting soy onto Western menus, albeit in a secondary sense.

This contrasted—and continues to contrast—with the uses of soy in Asia, where the crop has been cultivated primarily as a foodstuff for over a thousand years. Prized among Asians for its high protein content, soy is processed into tofu, soy sauce, soymilk, and miso paste, and is enjoyed in some regions as a preferred candy. Until the turn of the century, China proper was the primary growing-bed for soy, exporting its harvest within Asia. Nevertheless, intensified imperialistic aggression from both Russia and Japan led to economic and political change particularly in northeastern China. In so-called Manchuria, imperialism and globalization went hand in hand, and with increased Western demand soy rapidly became the cash crop of this previously unsettled region. The resource of soy now connected markets and people across the East-West divide, but in spite of its various uses, soy did not generate great enthusiasm in the West. This did not even change in the United States when New Deal policy encouraged extensive cultivation of soybeans. Indeed, at the end of the Second World War, American farmers were producing more soy than their Chinese competitors in Manchuria, and soy had surpassed other harvests to become the most important cash crop in the United States. Yet despite this economic significance, the soybean hardly played a role in the realm of collective Western imagination or self-representation.

The present article begins by examining this paradox of global economic power and Western cultural resistance. I will analyze soy as an issue of Western history and historiography. The article’s second part investigates the roots of the Western demand for soy. Finally, in the third section, the work of the Bureau of Plant Industry, a division of the U.S. Department of Agriculture, will be described in the context of advanced soybean cultivation in the United States.

**Soybeans: History and Historiography**

For approximately the last fifteen years, historical studies have placed greater emphasis on global interdependencies. Driven by the term “transnational,” historians have concentrated less on the development of a stringent method and instead have undertaken the intellectual adventure of challenging the idea of the nation as a productive category of comparative analysis. A recent essay

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3 For the use of soy as a foodstuff in Asia, see Christine M. Du Bois, Chee-Beng Tan, and Sidney W. Mintz, eds., The World of Soy (Urbana, 2008).

4 The three northeastern Chinese provinces Heilongjiang, Jilin, and Liaoning are popularly known as Manchuria in the West. Although the term is problematic from a historical perspective, I use it here for the sake of simplicity.

by historian Ian Tyrrell demonstrated this using the example of American history. As Tyrrell stressed, however, the transnational question is not intended to either affirm or deconstruct the idea of the nation, but rather to recontextualize global relations beyond the idea of “national” parameters. These methodological considerations are of central importance to the history of the cultivation and use of soy, as they illustrate the interdependence between the United States and the rest of the world. This is particularly noteworthy in times of global crisis, when oils and fats are often in short supply. America’s encounters with the world can be elucidated by studying the case of soy. As part of New Deal policy, the U.S. Department of Agriculture subsidized the cultivation of soy, bolstering prices, offering advantageous credits to farmers, and buying directly from the farms. This course of action had both local and global motivations. The European demand for soy increased steadily, enabling soy to fill the void created by the receding cotton industry, and subsequently, to reinstate a critical piece of the American export economy.

The increase of soy cultivation also served to stimulate industrial research into the potential uses of soy derivatives. Henry Ford was just one of the famous individuals to investigate the industrial applications of soy. In the interwar period, Ford developed his own agricultural trials and laboratories in order to find out if it was possible to convert botanical oils into plastic and rubber for applications in the automobile industry. The most conspicuous outcome of his experiments was the presentation of a soy car in 1942, the body of which was comprised entirely of plant-based derivatives. These visionary plans were purely speculative, though, as their further development was cut short by American entry into the Second World War. The war served to reinvigorate the U.S. government’s interest

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in soy, prompting 100 million dollars in subsidies to be issued. Concurrently, the government moved to regulate the use of soy oil, restricting particular industrial uses of soybeans, to preserve oil for margarine and shortening production. Ford’s fantastic soy car was also a casualty of restrictive practices, as the governmental regulation of vegetable oils and fats as foodstuff was prohibitive to the industrial designs on soy oil. In fact, in 1941, approximately 500 million pounds of soy oil were consumed by industrial projects—only a year later, this amount would be cut in half. The ensuing surplus created by governmental subsidies and decreasing demand in the postwar era was far from being earmarked for industrial use; rather, the American government remained focused on developing soy and soy oil as human food sources. The efforts of the Office of Strategic Services in the postwar period primarily addressed the problem of widespread hunger throughout Europe. Identifying soy as a potential cure for the ailment of hunger, the U.S. government began producing specialized cookbooks aimed at making soy appeal to the European tastes of housewives.

This overview of the intervention of the United States government into the production and uses of soy highlights the inadequacy of modern territorial boundaries as analytic categories of history. More prominently, soy enables an inquiry into the territorial representation of the nation as a realm of understanding, reflecting the narratives of progress and modernity. The historiographical challenge is to effectively trace the development of soy’s economic, cultural, and political impact. So far economic history has always greatly emphasized the process of global integration. However, historians who have adapted a more modern, transnational approach generally regard...
economic phenomena as part of an exchange process, allowing investigative forays into the fields of social influence and cultural change.¹¹ Thus, in the case of soy, the question becomes one of understanding an economic history that functions transculturally by asking the question of what connotations are associated with soy. What role does soy play in the construction of identity.¹² In the United States, apparently, none. After the Second World War, soy became the most important cash crop in the nation, with local American farmers serving consumers throughout the world. And yet, soy never attained a stature of perception or identification in American society similar to that of cotton, despite the fact that in 1950, the United States produced comparable amounts of both.¹³ An online search of the Library of Congress’s “American Memory” database provides an objective basis for confirming this relationship: the keyword “cotton” yields over 50,000 hits; “soy” or “soybean” barely 20.¹⁴ American society’s lack of interest in soy is not exceptional when compared to other Western nations. It is even possible to trace this lack of interest back to the beginning of the twentieth century, when the Western discovery of soy’s economic potential was still a novelty. Wide-ranging social identification was not an accompanying byproduct of the successful emergence of soy in Western markets in the 1910s. It is striking that, while soy fulfilled a variety of roles as an all-purpose crop in both America and Europe, it was never regarded as much more than the sum of its parts. For soy oil alone, contemporary texts contain references to potential uses ranging from margarine, salad oil, industrial lubrication, lamp oil, and soap, to glycerin, fatty acids, dyes, varnish, linoleum, and rubber.¹⁵ The search for products that advertised soy content nevertheless remains difficult. Residents of the English town of Port Sunlight, the Lever Brothers were, in 1909, among the first companies to employ soy oil in the manufacture of soap.¹⁶ With the name “sunlight soap,” the Levers successfully highlighted the locality of their product, but simultaneously downplayed its soy content in its advertising. This had the consequence of suppressing any negative connotations that a mention of “soy” might conjure up. Evidently, soy was not oriented to common marketing strategies in the same way as other plants. Only a few years before, the American Johnson Soap Company had bestowed a name upon a product that overtly referenced the origin of the oil used to produce it. Their new soap, “Palmolive,” established a brand that remains recognizable today.


¹⁵ Norman Shaw, The Soya Bean of Manchuria (Shanghai, 1911), mentioned mainly soap and margarine; the other products came later, see Agricultural Office, South Manchuria Railway Company, ed., Manchurian Beans (Dairen, 1929); David Legros and Jacques Kaltenbach, Le soja dans le monde (Rome, 1936); Roy H. Akagi, Bean Oil Industry in Manchuria, ed. English Section, South Manchuria Railway Company (April 1937).

¹⁶ Shaw, The Soya Bean of Manchuria, 20.
Such referential marketing strategies for soy or soy derivates are extremely difficult to find. Hardly any products containing soy seemed eager to advertise their multifaceted content. For as often as soy was processed or employed as feed, it remained colorless, invisible, and unknown.

Even today, the production and use of soy remains invisible to Western cultural consciousness, announcing its presence solely in the concrete moment of reality; namely, in the growing fields of tremendous scale where soy is currently cultivated. The societal indifference towards soy is also reflected in its historiographical fortunes. Neither in cultivation nor in consumption has the soybean or its derivative products been regarded as an integral component of Western economic or cultural narratives. In the context of economic analysis, the historical role of the soybean and its correlating use-value are generally marginalized.\footnote{Reynold P. Dahl, “Demand for U.S. Soybeans in the European Common Market: A Case for Optimism,” Journal of Farm Economics 47 (1965): 979–992; Roger J. Vandenborre, “Demand Analysis of the Markets for Soybean Oil and Soybean Meal,” Journal of Farm Economics 48 (1966): 920–934.}

With the increased emphasis placed on economic history during the 1970s, some attention was finally dedicated to the significant economic stature soy had attained in China and the United States. These studies, however, tended to limit the scope of their analysis to focus on either the Sino-Japanese or American cases independently.\footnote{For Manchuria, see Shun-Hsin Chou, “Railway Development and Economic Growth in Manchuria,” The China Quarterly, no. 45 (1971): 57–84; Ramon H. Myers and Herbert Bix, “Economic Development in Manchuria under Japanese Imperialism: A Dissenting View,” The China Quarterly, no. 55 (1973): 547–559. For the United States, see Munn “Production and Utilization of the Soybean in the United States”; Fornari, “The Big Change: Cotton to Soybeans”; Norman A. Turkish, “Commodities: High Finance in Soybeans,” Financial Analysts Journal 17, no. 2 (1961): 91–92, 95-101.}

The historical, political, and economic contexts, along with the significance of the countless changes initiated, have thus far been neglected by economic history at large. This observation allows us to speculate that soy was responsible for an economic and cultural transformation whose consequences would be felt—and continue to be felt—asymmetrically across the globe. The most visible changes precipitated by demand for soy relate to the physical area devoted to its cultivation, originally in Chinese Manchuria, and later in the United States, and also to potential side effects of this cultivation, such as labor migration or the expansion of infrastructure. And yet the cultural consequences—the developments that both consolidated and perpetuated this “soy revolution”—remain hidden from view.

**Manchurian Soy in Europe**

When we analyze the history of soy—its cultivation, uses, and economic strength—in the United States, a lot of connections to other parts of the globe become visible. I argue that governmental support in the cultivation of soy was a reaction to both national and international conditions, which constantly influenced one another. To trace this history is to ask when and why soy acquired
an economic prominence in Europe, and what the consequences of the suddenly incipient demand on Manchuria were.

In 1915, Gottfried Haberlandt lamented the fact that his father’s “Schützling”\(^{20}\) (pet project) was still not being cultivated in central Europe. His father, agricultural scientist Friedrich Haberlandt, had spent the 1870s campaigning passionately for an increase in soy cultivation. Success, however, eluded the elder Haberlandt; it was not until the First World War that “this noteworthy legume”\(^ {21}\) gained a measure of recognition outside of agricultural circles. Nevertheless, his son Gottfried Haberlandt stood ready and willing to further the budding popularity of the soybean. In an effort to boost the nascent interest in soy, he consented to write the introduction to a short, informative book extolling its virtues, although, in his eyes, the booklet was unable to “assert or advance any intrinsically novel considerations or facts.”\(^ {22}\) This episode shows that adequate knowledge of methods of cultivation and nutritional properties of soy was not at all lacking in nineteenth-century Europe. Rather, it was an agro-cultural apathy that impeded the cultivation of this plant. Considering the extensive European knowledge of soy and the bean’s popularity in other parts of the world, how was it that soy had managed to lead only a shadow of an existence in Europe up to this point? And how was it that this narrative suddenly changed, allowing demand for soy subsequently to explode?

The older Haberlandt did not gain his knowledge of soy through extensive field research in Asia, but through countless agro-scientific experiments conducted in Europe. In 1873, at the World’s Fair in Vienna, Haberlandt acquired a selection of approximately twenty varieties of seeds, with which he proposed to conduct his agricultural experiments. In the years that followed, Haberlandt organized the cultivation of his seed stock throughout various regions in Europe from his base at the University of Natural Resources and Applied Life Sciences in Vienna. In this fashion, he sought to spread his enthusiasm for the soybean within the wider circles of agricultural scientists, though he remained unable to install soy as a widely cultivated crop in Europe. The primary hindrance was the fact that Haberlandt and other European agricultural and nutritional experts sought to sell inexpensive soy protein as an alternative to more expensive animal protein. Further, Haberlandt’s attempts to cultivate the soybean were not particularly successful, owing largely to the fact that soy is ill-suited to cultivation in a European climate. After Haberlandt’s death, interest in the experiments faded, and, despite


\(^{21}\) Ibid.

\(^{22}\) Ibid.
previous efforts, so too did the hopes of widespread expansion of soy.

Also of relatively modest success was another project, initiated at approximately the same time: Nutritionists and medical scientists sought to establish soy as a food for diabetics. Soy contains no starch, but high percentages of protein and oil, making it exceptionally sustaining. Due to these benefits, soy had long been used in Asia as a diabetic food, though the plant was still unable to gain acceptance in Europe. France and the Netherlands were the sole European exceptions, having provided enriched bread baked with soy flour as a diabetic-specific alternative since the late 1880s. That a type of bread which so easily could have alleviated nutritional problems of diabetics struggled to gain viability in Europe was indicative of a serious flaw: “It may be (and we will even charitably suppose so) that this lamentable fact is only due to ignorance,” complained Sinologist Gustave Schlegel in 1894.23 Schlegel, however, focused so exclusively on the potential use of soy as a diabetic remedy that he failed to perceive soy as a source of more general human food.

With these two examples, the parameters of the European “soy-based” knowledge and use in the late nineteenth century have been defined. Soy was a plant that had entered into the realm of agro-scientific research, and whose uses were tirelessly vaunted by nutritional experts, and yet the soybean remained largely unknown. In portions of the population, soy was received with minimal interest, evincing closed-mindedness and slow-changing attitudes towards patterns in dietary consumption.24 Asian culinary preparations remained extremely foreign to the European palate, and European culinary experiments with soy, consequently, met only with moderate success. Europeans were more accustomed to seeing beans used as vegetables and attempted to prepare them as such, an approach that proved frustrating considering the long cooking time required to tenderize soy to the point of becoming edible. The association between soy and its homeland—China—also failed to inspire associations with the exotic, instead conjuring up images of the faltering Qing Dynasty. European consumers, therefore, had limited enthusiasm for soy, despite the ardent support some members of the scientific community demonstrated for it.

This situation began to change at the beginning of the twentieth century, when industrial interest in soy as an oil resource began to
grow. Low yields of American cotton and flaxseed, crops generally used for the production of margarine and soap, created a persistent demand throughout 1908–09 for alternative forms of vegetable oils in Europe. In a long-globalized market with fast communication pathways and streamlined supply chains, European industry managed to immediately meet this demand by importing soy from Manchuria. This was made possible in part by a surplus of soy that the north Chinese region yielded during the course of the Russo-Japanese War, which Japanese and Russian traders subsequently tried to offload to emerging soy markets in Europe and North America. The Japanese company Mitsui & Co., founded by the Mitsui family of business moguls, established itself as one of the first successful firms in the East-West soy trade. In November 1908, Mitsui sent an experimental load to England, and a few months later in March 1909, the first of countless following freight loads arrived in the English port of Hull. It would prove to be beneficial to the success of soy oil in the West that European oil mills designed to harvest cottonseed oil could also press soybeans without any technical reconfigurations. This development was coupled with the discovery by a growing number of farmers that a byproduct of the oil-harvesting process, the so-called bean cake, was an ideally suited form of animal feed. This was also true of cottonseed byproducts, but due to its high percentage of protein, the (soy)bean cake was more nutritious, not to mention cheaper. The impact of feeding bean cakes to animals was the subject of countless agro-scientific experiments, each quantifying the results of a soy-based diet on the quality of meat, butter, or milk. These studies produced astoundingly positive results, which would boost the budding demand for soy higher still.

Though not intended as a source of protein for human consumption, soy nevertheless prevailed, taking on an intrinsic significance in the global economy, and, in a somewhat bio-cyclical sense, in the human diet. The need for alternative vegetable oils and fats created a new commercial market for soy in Europe. In the years after 1909, soy continued to establish itself further, garnering a reputation as a viable source of both oil and animal feed throughout Europe. This augmented functionality of the soybean, which was similar to the multiple uses of cottonseed, made the plant all the more attractive in an agro-industrial sense. Since the low oil

25 The sudden and wide-ranging interest in soy was reflected in a series of articles published in the Economist as soon as the first soybeans landed in Europe, during the fall and winter of 1909-10.
27 As described in Charles V. Piper and William J. Morse, The Soybean (New York, 1923), 129-143.
yield of the soybean was similar to that of cottonseed, utilization of soy as a source of vegetable oil alone would hardly constitute a commercial breakthrough in the European market. Contemporary varieties of soybean yielded between 14 and 21 percent oil, which compared competitively to cottonseed (ca. 17 percent) and flaxseed (16–30 percent), but were still not in the same class as other traditional sources of vegetable oil: Copra, the dried flesh of the coconut, contains 60–75 percent oil; poppy seeds and peanuts are approximately 50 percent oil; and the oil content of sunflower seeds and rapeseed also compare favorably to soybeans. Aside from the two-fold usefulness of the bean in oil and cake form, price also had to be accounted for—a factor that made the soybean considerably more attractive to European purchasers. Japanese suppliers offered Manchurian soy for a lower price than American cottonseed. Cottonseed prices were inflated because of low harvest yields, though even if cottonseed prices had been “normal,” soy would still have been a competitive product.

Soy tied Manchuria to the process of global transformation, and in doing so, suddenly pushed the underdeveloped region into the international spotlight. As early as 1911, the soybean industry had grown to challenge the Chinese tea trade in terms of global economic significance, and it was projected that soy would soon rival even the silk trade. The unexpected arrival of the soybean on the world economic scene altered not only European agriculture and industry; increasing Western demand necessitated an essential realignment of economic, political, and cultural structures where soy had been born, so to speak, in China. In Manchuria, which was characterized by quasi-colonial dependency structures, soy had become the identifying cash crop, meaning that it was cultivated mainly in monoculture and for export. In the Manchurian case, the territory was established as a global satellite dedicated exclusively to the cultivation of soy.

The worldwide economic situation from the late nineteenth to the beginning of the twentieth century was characterized by asymmetries between industrialized states and colonized regions. The northeastern region of China, Manchuria, was a casualty of informal imperial hegemony, as evidenced by the unfair representation of Chinese interests in international treaties and through economic discrimination. However, at the end of the nineteenth century, global changes were afoot. China, which up until this time had been

29 Shaw, The Soya Bean of Manchuria, 1.
30 A comprehensive English-language survey of the history of northeast China is still lacking, but there are excellent monographs, including Prasenjit Duara, Sovereignty and Authenticity: Manchukuo and the East Asian Modern (Lanham, 2003); and Mariko A. Tamanou, ed., Crossed Histories: Manchuria in the Age of Empire (Honolulu, 2005).
unimpressed by Western cultural and economic advances, finally began to crack under the pressure exerted by Japanese expansionism. Japan’s growing desire to expand its territory to gain a foothold on the Asian continent finally culminated in the Sino-Japanese War of 1894–95. Manchuria smoldered at the center of an international flashpoint of competing Russian, Chinese, and Japanese imperialist interests. The Russo-Japanese War of 1905—in the course of which soy came to the attention of the European market—marked the highpoint of tensions in this “scramble for Manchuria.”

Migration, infrastructure development, and an expansion of trade are typical signifiers of a region with a history of informal colonial dependencies. Manchuria is a prime example of the interdependencies of such processes. Between 1890 and 1942, approximately 8 million Chinese, primarily from northern provinces, immigrated to Manchuria, comprising one of the largest human migrations of the early twentieth century. This immigration was accompanied by the steady establishment of infrastructure and trade. These developments, however, were not controlled by the Chinese, but by the Russians and Japanese. Railroad systems in colonial regions existed primarily to expedite the transfer of resources from their domestic origin to seaports, from where they could be easily distributed throughout the world. Manchuria’s link to the centers of the industrialized world came in the forms of the Russian Chinese Eastern Railway and the Japanese South Manchurian Railway. The infrastructural benefits provided to the colonies by railway connectivity were, however, limited. The construction of the railroad did not usually stimulate the colony’s industry, as its components were almost universally manufactured in the imperialist homeland. Railcars, engines, tracks, and bridge-building materials often came from the colonizing country. The Manchurian railroads owed their existence largely to the economic interests of its imperialist “suitors.” Both the Russians and Japanese viewed their Manchurian railroads as investments oriented towards attaining capital interests. Until 1931, no single nation managed to establish complete hegemonic control over the Manchurian case; nevertheless, the soy trade was thoroughly regulated by the Russians and Japanese. These rail lines traveled over outlying extraterritorial regions belonging to either Russia or Japan, and the soybeans produced by Chinese farmers in Manchuria were subsequently shipped to Europe and the United States via either the Russian port of Vladivostok or the Japanese-controlled city of Dairen. The primary trade destination in Europe

31 For an outline of such processes, see Wendt, Vom Kolonialismus zur Globalisierung, and Christopher A. Bayly, The Birth of the Modern World, 1780–1914: Global Connections and Comparisons (Malden, MA, 2004).
33 David Wolff, To the Harbin Station: The Liberal Alternative in Russian Manchuria, 1898–1914 (Stanford, 1999).
was London, where soybeans were transported to the European continent through either Amsterdam or Hamburg.

European purchasers preferred to import whole soybeans as opposed to pre-processed alternatives like pressed oil or pre-formed bean cake. One reason was that they wished to avoid unrefined or diluted oil, but this preference also reflects a general trend toward importing raw materials that was typical of industrialized economies in the late nineteenth and beginning of the twentieth century. In an effort to protect their own economies, industrialized nations would often impose high duties on the import of manufactured goods, creating a preference for raw materials that could instead be processed domestically and then exported.34

Following this formula, Germany became the largest importer of soybeans and the leading European exporter of soy oil and bean cake during the period between the two world wars.35 The Germans first became interested in Manchurian soy during the general increase in demand for vegetable fats and oils during the First World War. Whereas other European powers turned to their colonies for oil alternatives—cottonseed, coconuts, or sesame seeds—Germany sought to establish trade relations outside of the pre-established imperial network. China remained outside of direct European influence, accordingly presenting the Germans with the opportunity to mitigate their need for oil and simultaneously meet growing demand for bean cake. Alternatively, China belonged to one of the most critical production regions for the oil industry during the interwar period; only British India and West Africa produced more raw resources for the harvest of vegetable oil.36 All this places historical-political relations in an economic context: At the end of the 1920s, Germany had a substantial interest in the prosperity of the Manchurian soy industry, which increased trade relations between Japan and Germany.

Support and Stimulation in the United States: The Bureau of Plant Industry

The emergence of soy in the world economic market in 1909 created competition for American cottonseed, which was in short supply following a year of widespread crop failure. Up to this point, European consumers had relied heavily on cottonseed, importing it both for its high oil content and for its potential use as animal fodder. As European consumers discovered, soybeans from Manchuria could

34 Wendt, Vom Kolonialismus zur Globalisierung, describes this process in general. As for soybeans and soy oil, it has been contemporarily observed by Erich Stietz, Die Soja in der Weltwirtschaft. Ein Beitrag zur Ernährungs- u. Rohstoffwirtschaft der Erde (Gießen, 1931), 28–34.
and did replace cottonseed in both of these functions, creating a sort of “double competitor” for cottonseed. The appearance of soy in the European marketplace thus precipitated apprehension among American cottonseed producers and traders, who sensed a threat to their prime consumer market. With the receipt of the first soy shipments in Great Britain in 1909, the U.S. Bureau of Manufactures issued a request for detailed information to consulates stationed in key Asian and European harbors and trade epicenters. These consulates were charged with providing an assessment of the potential competition that the emerging Chinese soy industry posed to the American cottonseed industry, with instructions to focus explicitly on a comparative evaluation of the respective oil yields of each crop. Although there was as yet little tangible evidence of competition—a fact supported by the consular reports—the approach of the Bureau of Manufactures reflects the alarmed American response and its preparedness to elicit the particulars of the economic situation. The U.S. consulate in England, the place of the soybean’s first permeation of the European market, prophesied the incredible economic potential of the soybean:

A valuable oil, used largely in the making of soap, is extracted from the bean, and it is anticipated that the meal and cake manufactured therefrom may compete very seriously with American cotton-seed cake.... There is no doubt, however, that the soya-bean cake and meal will be used more and more in this country, provided a sufficiently low price is maintained.

This high appraisal is notable because, up to this point, import quantities remained low enough that special shipments were unwarranted. In light of the consular reports, a steady increase in American soy imports can be observed, though reliable figures on the amount of soy imported in both Europe and the United States would not emerge until some years later. It was not until 1911 that the United States imported a quantity of soy oil valued at about $2.5 million and an amount of bean cake valued at approximately $60,000. The amount of soy being exported from Manchuria during this time fluctuated. This is largely attributable to the diplomatic tensions existing between China, Russia, and Japan in Manchuria at this time.

The key questions are how and why the United States became the leading producer of soy in under thirty years. What implicit

economic and political machinations lie concealed in what appears to be a solely agricultural transition from cotton to soy? What interest did the United States have in the cultivation of a plant whose economic impact in the West prior to the First World War was relatively unheralded? And what role did this transformation play in a larger, globalized context?

Similar to the European case, the history of soy in the United States before 1900 was limited primarily to the realm of agricultural experimentation, though, in contrast to Europe, American agriculturalists discovered relatively early on that several American regions were ideally suited to the prodigious cultivation of soy. Belonging to the United States Department of Agriculture (USDA), the Bureau of Plant Industry initiated experiments across the United States even before the First World War. In both Europe and America, most scientific investigations were academic or governmental. In Europe, botanical gardens and exotic plants were prestigious objects of princes, and scientific expeditions, like those of the nineteenth century, were unthinkable without sovereign subsidies. But the botanical interest of the American government far exceeded the European standard of collection, classification, and research, orienting itself more towards the utilitarian feasibility of domestic cultivation. With the founding of the USDA in 1839, this goal of domestic cultivation manifested itself at the federal level, with the newly formed agency calling for systematic evaluation and study of foreign plants and breeds.

To assist in these efforts, the Office (as of 1901, Bureau) of Plant Industry was founded in 1900. This division aggregated several federal agencies previously scattered throughout the USDA whose work was concerned with questions of feasibility and the establishment of foreign plants domestically on a variety of scopes. This included the divisions responsible for vegetable pathological and physiological investigations, botanical experiments, grass and forage plant investigations, pomological investigations, experimental gardens and grounds, foreign seed and plant introductions, and congressional seed distribution. In the years leading up to the First World War, the primary assignment of the Bureau of Plant Industry remained to research the sustainability of certain crops and determine their economic, agricultural, and industrial potential. Following the war, the goal shifted towards expanding existing research and implementing the results with farmers.
The Bureau of Plant Industry was not only the central institution responsible for the cultivation of soy in the United States in the 1910s, but also for initiating the agricultural transformation that would bring soy to prominence in the 1930s. Charles Piper, head of the USDA’s Office of Forage Crops, and William J. Morse, Agronomist in Forage Crop Investigations within the Bureau of Plant Industry, can be counted among the prime advocates for the soybean in the United States. They had published the results of their research as early as the 1910s and 1920s, which had been conducted at the Arlington Experimental Farm in Virginia, the current site of the Pentagon. The specialists expounded the superlative qualities of soy, citing its ability to boost nitrogen levels in soil, thus enriching the earth naturally through its cultivation. This ability constituted the sole appeal and rationale for American farmers to begin growing soy. Factors inducing American adoption of soy were, therefore, fundamentally different from European motivations. The American agricultural scene was concerned with maintaining the best possible soil quality for the production of cotton and corn. At first, neither the nutritional properties of soy nor its oil content were of much interest; rather, these more concrete uses of harvested soy were decidedly secondary. Indeed, considering that the United States satisfied its demand for vegetable-based oil almost entirely with imported coconuts, the harvested crop of soybeans possessed little industrial value, and was earmarked almost entirely for inclusion in hay.

Morse and Piper were nevertheless enthusiastic about the potentially diverse uses of soy as a sort of all-purpose plant. With the increased demand for vegetable oils during the First World War, the potential use of soy was not lost on Morse and Piper. Witnessing the increasing amounts of soy being exported from Manchuria to Europe—and also to the United States—strengthened their conviction that soy needed to be more widely cultivated in America: “The large annual importations of soy beans, oil, and cake into the United States during the last few years indicate a ready market for products obtained from America-grown beans.” Morse and Piper sought to ensure that the botanical expeditions undertaken by the Bureau of Plant Industry kept soy firmly in the center of their endeavors. During the 1920s, a total of three expeditions to Asia were conducted, two with the explicit goal of comparing growing conditions and cultivation methods of various types of soybeans. The USDA authorized these expeditions because the cultivation

42 Piper and Morse, The Soybean (1923), was the most comprehensive and best known of their many publications.
44 Piper and Morse, The Soy Bean, with Special Reference to its Utilization for Oil, Cake, and Other Products (1916), 18.
of cotton and corn was becoming economically difficult: the American cotton industry was being ravaged by the boll weevil, which devastated the cotton crop year after year, and the famed Corn Belt was similarly impacted by the corn borer.

Rattled by crop failure, monoculture, and mismanagement, the American agricultural industry badly needed to modernize. Soy appeared to be a crop with promise for the future, filling the void caused by the receding demand for cotton, and yielding both agricultural and industrial applications in the process. Thus, in February 1929, shortly before the beginning of the Great Depression, agricultural experts P. Howard Dorsett and William J. Morse set off with their families on a research expedition to Asia. Dorsett worked as a horticulturalist in the Office of Foreign Plant Introduction, an agency of the Bureau of Plant Industry, and had previously led a research expedition to Asia (1924–27) with the support of the USDA. This newest venture, the “Oriental Agricultural Exploration Expedition,” was purposefully conducted with the aim of gathering information that could be put to use in American agriculture to further the cultivation of soy. Field research would focus particularly on the collection of new varieties of soybeans, as well as on the search for “methods of utilization of the soybean for food and all byproducts, especially those industrial.”45 Significant hopes were pinned on the excursion, which was claimed to be as a window for the expansion of soy in the United States:

Although grown primarily for forage in the United States, many sections are looking forward to the production of the soybean as a cash grain crop for oil and oil meal, and for human food, and industrial uses. It is quite generally predicted that the soybean will become one of our major crops, particularly in the South of the boll weevil...
sections and in the Corn Belt states through the menace of the corn borer.\(^{46}\)

Dorsett and Morse remained abroad for nearly two years, placing particular emphasis on Japanese networks of knowledge and trade. They stationed themselves along the Japanese South Manchurian Railway and its experimental fields in Manchuria. Dorsett and Morse returned to the United States with a total of 9,000 distinct specimens, constituting ca. 4,500 different types of soybean. The remaining samples were those deemed to be of particular potential value for American agriculture.

Concurrent with their field studies, Dorsett and Morse traveled to the epicenters of the soy trade, such as Harbin, where they met with other scientists, including the German soy expert Lene Müller and Russian botanist Boris V. Scvorcov. Such encounters fostered the formation of an international scientific community in 1920s Manchuria, which drove the distribution of the soybean worldwide. In Manchuria, however, the researchers were limited solely to investigating the cultivation of the crop, not its industrial processing. As in most regions with colonial or near-colonial dependencies, the subsequent industrial processing of the resultant harvest was still conducted nearly exclusively outside of Manchuria. Thus, Dorsett and Morse documented the production of tofu, soymilk, soy sauce, miso paste, candy, the use of bean cakes as fertilizer, the production of soy oil for various industrial applications, and the export of soy to Europe and America, predominantly either from the city of Dairen, or from Japan, or Korea.

The work of Dorsett and Morse became the cornerstone upon which the American soy industry was built. Their research encouraged...
the propagation of the crop throughout the United States, enabling America to attain the title of the world’s largest producer of soy shortly after the Second World War. While soy was being grown solely in North Carolina—if at all—prior to First World War, the interwar period saw a boom in soy cultivation compared to previous cash crops, in the cotton and corn belts. Between 1924 and 1945, soy proliferated prodigiously, as evidenced by the dramatic increase in growing area dedicated to the crop. The cumulative area devoted to soy production grew eightfold over this time, from ca. 1.8 million acres to 14.2 million acres.47 Such incredible growth would not have been possible without significant federal support, and would also have been inconceivable without the Great Depression, which boosted production. In the aftermath of the First World War, the USDA encouraged cultivation of soy by producing countless brochures dedicated to spreading the word about America’s next agricultural frontier. To a certain extent, this soy-centric advertising campaign mitigated the impact of the reeling American cotton industry, though it was not enough to establish a sustained American commitment to soy. Despite the exhaustive efforts of the Bureau of Plant Industry, cultivation of soy spread haltingly throughout the 1920s, with farmers maintaining a skeptical distance between themselves and the alien crop. The first notable increase of farmland devoted to soy occurred in 1933 and was the result of a USDA initiative stemming from President Franklin Roosevelt’s New Deal policy of the 1930s. This measure was supported through credit incentives and the imposition of higher import taxes on soybeans.48 Increased cultivation was particularly successful throughout the Corn Belt, including the states of Illinois, Indiana, Ohio, Iowa, and Missouri, where existing farm machinery formerly used to cultivate corn could continue to be used to grow and harvest the soy crop. In the 1950s, American farmers surpassed the Chinese in the production of soybeans. Soy would become the United States’ most important cash crop, and was, ironically, primarily exported back to Asia.49

Conclusion

The breakthrough of soy in the West at the beginning of the twentieth century can be attributed to two fundamental causes, which are mutually dependent. The first cause lay in the imperial tensions between Russia and Japan, which had been building since the late nineteenth century. In the course of this conflict, Manchuria was unlocked: It became a destination of massive human migration; railroads were constructed; and soy became the dominant cash crop

47 Munn, “Production and Utilization of the Soybean in the United States.”

48 For details, see Fornari, “The Big Change: Cotton to Soybeans.” Besides the New Deal, the U.S. support of soy also resulted from the 1930s oil and fat crises. See Ayodeji Oluokoji, “The United Kingdom and the Political Economy of the Global Oils and Fats Business during the 1930s,” Journal of Global History 4 (2009): 105-125.

of the region. A second cause for soy’s Western proliferation must be ascribed to strongly increasing Western demand for alternative forms of vegetable oils and fats. At the turn of the twentieth century, the soybean was well known in the refined circles of botanical enthusiasts and agricultural scientists, but its economic potential was largely ignored. Demand for soy became prominent with the global shortage of conventional vegetable fats and oils between 1908–09, and the outbreak of the First World War only exacerbated this deficit. Though soy was needed for the manufacture of many products, demand for it as a substitute oil source continued to grow exponentially. A byproduct of the oil-harvesting process, the so-called bean cake, would soon evolve into the center of interest in soy. This protein-rich cake proved to be of superlative value as animal feed, providing a secondary entrance for the soybean into Western agriculture.

The booming demand for soy exercised a balanced global impact that affected not only Western agricultural and industrial enterprises, but also had further international consequences. As a raw material, soy unified people and economies in the East and West. Initially coming to prominence as the prime Manchurian cash crop to meet rising global demand, the crop attained notable prominence in the United States in the 1920s and 1930s through the support of the American government. Despite its budding economic significance in the West, however, the plant failed to permeate preexistent cultural institutions. Up to this point, soy attained no unique place in the sociocultural narrative of the West, but was relegated to a minor status. This discrepancy between soy’s economic significance and its cultural perception was governed by a quintessential asymmetry, whose complex implications for local consumerism, regional conceptions, and global economic implications remain open to debate. One firm conclusion, however, is that the soybean would not have become the most important cash crop of the United States without the subsidies and support programs of the USDA.

Translated by Richard Lambert III

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