

**Nature's Helper:
Mikimoto Kōkichi and the Place of Cultivation
in the Twentieth Century's Pearl Empires**

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Abstract

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This dissertation tracks three interrelated developments at a local level: the origins of pearl cultivation in the Japanese empire, the rise of European machine-mediated gemological testing designed to identify “cultured” pearls from Japan, and the contentious transformation of the cultured pearl into a ubiquitous object of adornment in the United States. It argues that Japanese pearl cultivation and the products of pearl cultivation redrew distinctions between nature and culture in the twentieth-century world. Its structure comes from the company controlled by a figure later known inside and outside the Japanese empire as the “Pearl King.”

Some of the Japanese empire's largest farms appeared not on land, but in the water. At the turn of the twentieth century, a Japanese man named Mikimoto Kōkichi began to raise living shellfish and surgically manipulate them in order to produce pearls for export. In the formal terms of imperial Japanese industrial property and fisheries law, pearl oysters became ownable creatures that were susceptible to tinkering and capable of producing pearls on demand. Wide-ranging kinship, labor, patronage, and property relationships supported Mikimoto's reputation as an individual whose business was raising shellfish and selling the pearls they were made to produce. Mikimoto made the first exclusive ownership claims over pearl oysters, their habitats, and their productive capabilities, but those same moves resulted in legal and extralegal disputes with fishers and other would-be cultivators in Japan. The advantages of monopoly and monoculture also revealed social and ecological fissures amid constant battles to keep human and non-human interlopers out of individually-claimed ocean space.

From the early 1920s onward, pearl dealers in Paris and London attempted to create and enforce distinctions between pearls cultivated in the Japanese empire and the “oriental” pearls that they themselves bought and sold. Members of Europe's largest pearl wholesaler associations turned the “Japanese pearl” into an issue of legal demarcation, product testing, and advertising rhetoric. Despite claiming to be connoisseurs of surfaces, anti-cultivation wholesalers began to argue that a pearl's value could be ascertained only after an examination of its internal structure. European pearl dealers tried to shore up trust between buyers and sellers by shedding light on what they saw as the innate differences between a natural and a cultured object. Years of legal and scientific debate resulted in a transnational system for separating “cultured” pearls from “natural” ones.

Markets for “natural” and “cultured” pearls changed dramatically amid the global repercussions of post-1929 financial crisis and post-1931 Japanese aggression on the Asian mainland. A standard view in the historiography of the Persian Gulf region is that Japanese pearl cultivation decimated the region’s hitherto dominant pearl economy as its oil economy was taking shape. This dissertation argues that mass pearl cultivation was a contradictory response to a rising number of cultivators in 1930s Japan. Mikimoto tried to control competing Japanese pearl production through the use of patent-sharing agreements, even as his own farms processed more shellfish than ever before.

The 1920s European battles over pearl nomenclature moved to a new and different field in the interwar United States. In New York City, the world’s largest post World War I market for pearls and precious stones, the affordability of cultured pearl necklaces became part of gendered depression-era appeals by Mikimoto’s salesmen—and newly arrived American cultured pearl dealers—to entice American women to purchase objects of adornment rather than objects of investment.

Even as Mikimoto made claims to intervene in the lives of marine shellfish in order to produce more pearls, his claims fueled clashes over how, and by whom, those interventions and products would be controlled and represented. Precisely because there were multiple and often competing meanings of cultivation, relationships between humans and mollusks—as well as the products that resulted from them—became flashpoints of conflict on land and sea.

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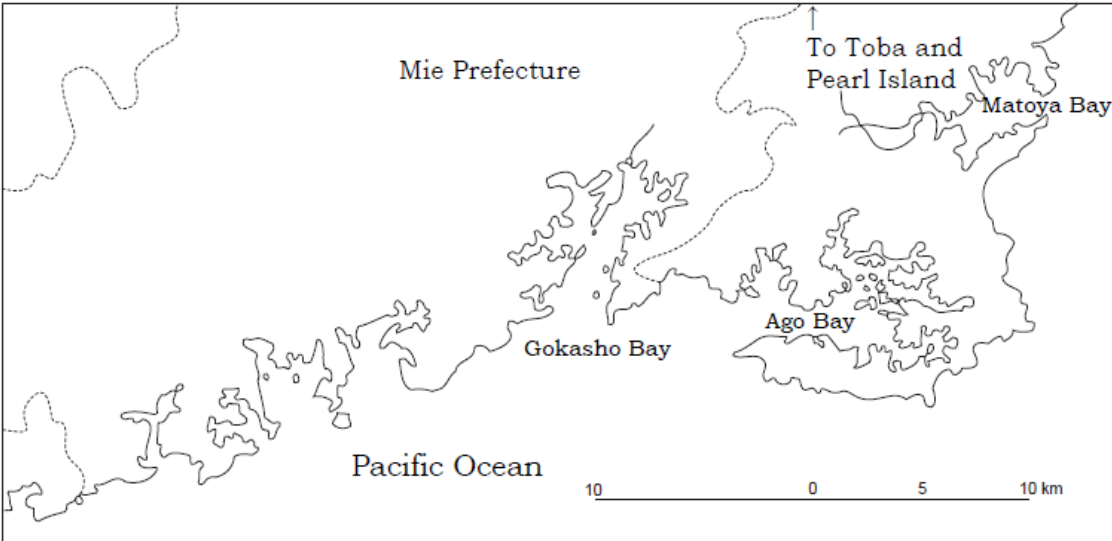
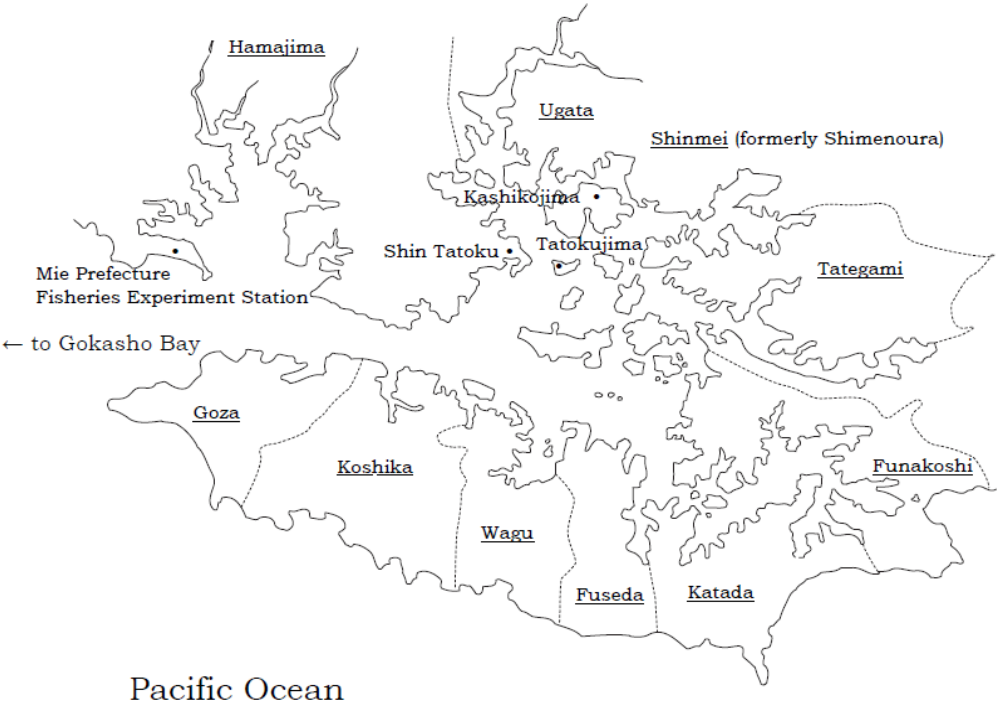
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Introduction

A million and a half *akoyagai* pearl oyster shells can be piled far higher than a standing person. In late 1936, a man named Mikimoto Kōkichi walked in the shadow cast by one such mound. Mikimoto estimated that during four decades of working with pearl oysters he had been responsible for the deaths of 150 million mollusks, a hundred times more than the number in the midden that lay before him. In order to atone for this, Mikimoto explained, he had decided to hold a Buddhist memorial ceremony (*kuyō*) on his company's island theme park, a landmass he called Pearl Island (*Shinjugashima*). Around thirty Pure Land (*Jōdoshū*) monks recited sutras in front of a massive altar that had been constructed over four frantic days. More than a hundred of the company's wage-laboring female divers assembled nearby. Print reporters and a Paramount newsreel cameraman recorded the proceedings for dissemination inside and outside the Japanese empire.¹ Several thousand observers in total gathered to watch the ceremony. All arrived from the mainland after having crossed a jury-rigged floating bridge of rafts that, on any other day, would have supported cages full of pearl oysters in the water.²

The ceremony was of a sort that Mikimoto (along with a sizeable number of Japanese entrepreneurs whose businesses entailed the deaths of living creatures) had

¹ *The Japan Advertiser*, 11 November 1936.

² *Ise Shinbun*, 13 November 1936; *Ise Shinbun*, 16 November 1936; *Shin Aichi*, 16 November 1936.

staged since the early twentieth century.³ This time the *kuyō* took place on a scale larger than Mikimoto had attempted before. “To date I have killed 150 million pearl oysters,” Mikimoto told the crowd on Pearl Island. “I began as a helper in an *udon* shop, but I have gained position and wealth. Holding this memorial has lifted a weight off my chest. I can now enter the Land of Ultimate Bliss (*gokuraku*) without hesitation. But my goal is to live to the age of eighty-eight. I will kill 500 million oysters by the time I die. At that time there will be an even bigger ceremony.”⁴ Almost two decades before his eventual death (at ninety-six) in 1954, Mikimoto held vigil not only for pearl oysters, but also for himself.



*Mikimoto (right of center) and his mound of shells, 1936.
Courtesy of the Mikimoto Pearl Island Museum Archives.*

³ For a broader treatment of *kuyō* animal ceremonies, which far predate the twentieth century, see Barbara R. Ambros, *Bones of Contention: Animals and Religion in Modern Japan* (Honolulu: University of Hawai'i Press, 2012).

⁴ *Ise Shinbun*, 16 November 1936.

Along the fluid edges of the late nineteenth century Japanese empire, Mikimoto Kōkichi began to raise, surgically manipulate, and kill shellfish in order to produce pearls for export. He became famous in the early twentieth century as the holder of the first Japanese patent for the induction of pearls inside living marine shellfish and as a cultivator who controlled the largest and most widely dispersed network of farms for raising them. Mikimoto's public persona as someone whose own life was intertwined with those of shellfish was one result of the framing of saltwater and living creatures as tradable commodities, yet it also stemmed from the legal systems that allowed those framings to take place under the terms of individual ownership and authorship. Humans in general did not ally themselves with pearl oysters; Mikimoto in particular did.

History leaves room for a limited number of actors. When it comes to the cultivation of pearls, one man has been left standing. Perhaps unsurprisingly, Mikimoto takes center stage in many of the works that have been written about pearl cultivation since the turn of the twentieth century.⁵ Mikimoto and many others described his life as a

⁵ A brief survey of the laudatory strain of Mikimoto bibliography—some of it published in-house by the Mikimoto company, some authored by Mikimoto's descendants and relatives—would certainly include: Mamada Takashi, *Mikimoto Kōkichi: Yōshoku shinju no hatsumeisha* (Osaka: Nihon shuppansha, 1942); Ototake Iwazō, *Mikimoto Kōkichi* (Tokyo: Baifūkan, 1948); Ototake Iwazō, *Denki Mikimoto Kōkichi* (Tokyo: Kōdansha, 1950); Sawada Ken, *Mikimoto Kōkichi: Sekai no Shinjuō* (Tokyo: Kaiseisha, 1952); Robert Eunson, *The Pearl King: The Fabulous Story of Mikimoto* (New York: Greenburg, 1955); Mikimoto Ryūzō, *Mikimoto Kōkichi* (1961); *Mikimoto shinju hatsumei 75 shūnen: 1893-1968* (Mikimoto, 1968); Mikimoto Yoshitaka, *Mikimoto Kōkichi no omoide* (Toba: Mikimoto shinjutō shiryō hensanshitsu, 1979); Genji Keita, *Shinju tanjō: Mikimoto Kōkichi den* (Tokyo, Kōdansha, 1980); Ototake Ai, *Chichi, Mikimoto Kōkichi o kataru* (Tokyo: Mikimoto, 1993); *Mikimoto: Mikimoto shinjuō to sono hōsekiten 100-nen* (Tokyo: 1993); Mikimoto shinju hatsumei 100-shūnenshi gōdō hensan iinkai, ed., *Kagayaki no seiki* (Tokyo: 1993); *Mikimoto shinju hatsumei 100-nenshi* (Tokyo: Mikimoto, 1994). The above list excludes a wide array of published articles on Mikimoto, some of which appear in the bibliography. Critical questions about the priority and primacy of Mikimoto's business—and alternative narratives about the origins of pearl cultivation—began to be published in earnest during the United States occupation, though there were also a few pre-1945 examples. These increased from the 1960s onward. See, for example, Alvin R. Cahn, *Pearl Culture in Japan* (Tokyo: General Headquarters Natural Resources Section, 1949); Ōbayashi Hideo, *Mikimoto Kōkichi* (Tokyo: Yoshikawa Kōbunkan, 1971); and Kuru Tarō, *Shinju no hatsumeisha wa dare ka?: Nishikawa Tōkichi to Tōdai purojekuto*

self-made rags-to-riches transformation. He may have peddled noodles in the years before and after the 1868 overthrow of Tokugawa shogunal rule and the formation of an imperial Japanese nation-state under the rule of the Meiji emperor, the story goes, but he became the “Pearl King” of the twentieth century world.

This dissertation does not presume to be a biography of Mikimoto. I seek rather to reconstruct the global changes that, for a time, supported Mikimoto’s identity as an individual whose business was raising shellfish and selling the pearls they were made to produce.⁶ I approach this task first by examining wide-ranging kinship, labor, patronage, and property relationships that underlay the cultivation of pearls along the coastlines of the Japanese empire. Mikimoto headed a company based upon a web of ownership claims, but he did not make or defend those claims alone. Throughout much of his life, Mikimoto Kōkichi spoke about—and commemorated—his relationships with living pearl oysters, yet those relationships were not as direct as he let on. Myriad intermediaries spoke and acted on his behalf.⁷ Mikimoto’s business brought heterogeneous elements

(Tokyo: Keisō shobō, 1987). By the 1960s, a wider range of historical, sociological, ethnographic, and economic studies had appeared in tandem with the significant postwar expansion of cultivation. See, for example, Tange Makoto, “Shinju yōshoku ni okeru gijutsu no kōzō: jō,” *Gyogyō keizai kenkyū* 8 (1960) and “Shinju yōshoku ni okeru gijutsu no kōzō: ge,” *Gyogyō keizai kenkyū* 9 (1960); Matsui Yoshiichi, *Shinju no jiten* (Tokyo: Hokuryūkan, 1965); Uraki Shin’ichi, *Shinju no keizaiteki kenkyū* (Tokyo: Tōkyō Daigaku Shuppankai, 1970); *Shin’en shinju nanajūnen* (Shinju shinbunsha, 1978).

⁶ This project also joins a growing body of historical work on a worldwide trade in pearls, even as it sheds new light on the ways that pearl cultivation threw certain aspects of that trade into disarray. See, for example, Micheline Cariño and Mario Monteforte, *Une histoire mondiale des perles et des nacrés: pêche, culture, commerce* (Paris : L’Harmattan, 2005); Molly A. Warsh, *Adorning Empire: A History of the Early Modern Pearl Trade, 1492-1688* (PhD diss., Johns Hopkins University, 2009); Matthew S. Hopper, “The African Presence in Arabia: Slavery, the World Economy, and the African Diaspora in Eastern Arabia, 1840-1940” (PhD diss., UCLA, 2006); Victoria Penziner Hightower, “Pearls and the Southern Persian/Arabian Gulf: A Lesson in Sustainability,” *Environmental History* v. 18 (January 2013), pp. 44-59.

⁷ Daniel Todes, for one, has examined the rise of a factory-like organization of scientific production in the late nineteenth century Russian empire, where the physiologist Ivan Pavlov employed dozens of assistants

together: fishing rights over ocean space; patent rights over methods of operating on living pearl oysters; the employment of lawyers to defend those rights; labor agreements with female divers who tended to what Mikimoto called his “mother oysters,” the training of male (and, subsequently, female) surgical technicians; the dispatching of salesmen to sell pearls on his behalf in Japan and, to a greater extent than any other Japanese manufacturer or agriculturalist before the 1950s, directly overseas. Following the moving parts that constituted Mikimoto’s company has required me to juggle multiple scales of analysis. One direction has been to zoom out, in order to visualize networks that facilitated the movement of living shellfish and pearls around the twentieth century world. The other direction has been to zoom in, in order to delve into the local workings of monopoly rights regimes, the evaluation of living creatures and their products, and the legal division of nature from culture.

Even as Mikimoto made claims to intervene in the lives of marine shellfish in order to produce more pearls, his claims fueled clashes over how, and by whom, those interventions and products would be controlled and represented. Dispute arose in Japan when other marine entrepreneurs attempted to test whether Japanese law protected claims by people other than Mikimoto. The late nineteenth century extension of patents and fishing rights to pearl oysters in newly defined imperial Japanese waters also paved the way for transnational controversy over the products of national monopolies. Outside the Japanese empire, news of a large and growing pearl cultivation industry provoked

to operate on dogs by the thousands. The scales at which Pavlov made (and still make) attributions of credit surprisingly difficult. Just what did Pavlov himself do? See Daniel Todes, *Pavlov’s Physiology Factory: Experiment, Interpretation, Laboratory Enterprise* (Baltimore: The Johns Hopkins University Press, 2001).

widespread curiosity even it revealed pointed concerns. After the First World War, pearl dealers in Paris and London looked for other ways to create and enforce distinctions between “Japanese” pearls and the “oriental” pearls that they themselves bought and sold. Members of Europe’s largest pearl wholesaler associations turned spherical pearls from Japan into objects of legal demarcation, product testing, and advertising rhetoric. Attempts to separate pure nature from the deception of a culture that was associated only with Japanese hands turned the provenance and process of a “Japanese cultured” pearl into simultaneous targets of concern. The outcome of legal and scientific debate was a machine-mediated system for dividing a market for “cultured” pearls from a market for “natural” ones.

Pearl Farming as Big Farming in Japan

At his height in the mid-1930s, Mikimoto presented himself as a cultivator of more than 41,000 acres of saltwater and as the leader of a thousand-employee export enterprise. The unusually large scale of Mikimoto’s coastal farming infrastructure becomes clearer if we place it within wider debates over the organization and characterization of landed agriculture in the Japanese empire.

In the late nineteenth century, new voices chimed in about the proper size of farms in Meiji Japan. One of the regime’s most prominent political figures, Inoue Kaoru (1836-1915), suggested in the mid-1880s that the government should promote the formation of large agricultural units. “Agriculture is truly the base of the state’s economy,” assured Inoue, but if agriculture was to remain at the base, it would need to be

refashioned as capitalist enterprise.⁸ Inoue's position, known at the time as the "Big Farming Proposal" (*Dainōron*), espoused an ethos of extensive and intensive farming. It included the state-mediated concentration of landholdings among a select few, the hiring of wage labor to work consolidated fields, and the substitution of animals and machines for human hands wherever possible.⁹ The Big Farming Proposal inspired others to offer their own variants. A Goldilocks dilemma ensued as small farming (*shōnō*), middle-sized farming (*chūnō*), and big farming (*dainō*) each took turns under the spotlight.¹⁰ Debate over what it might mean to call agriculture the basis of Japan's economy swung between arguments stressing the efficiency of mega-farms and others promoting the redistributive benefits of small farms, with a middle road of enticing or coercing absentee landlords to

⁸ *Segai Inoue-kō den dai 4 satsu* [v. 4] (Tokyo: 1934), pp. 17-18.

⁹ Ronald Dore, *Land Reform in Japan* (New York: Oxford University Press, 1959), pp. 59-61. The decade between the late 1870s and the late 1880s saw a number of huge northern land deals by politically connected figures. Many were among the elite of the Tokugawa era who received favorable terms in part to soften the blow that followed the incorporation of more than 250 domains into the Meiji state. Typically these deals included spaces marked by surveyors as "yet to be developed lands" (*mikaichi*). In Hokkaido, Tokugawa Yoshikatsu (Keishō), the final *daimyō* of Owari domain, acquired 500 *chō* (about 1225 acres) in 1878. The last Chōshū domain *daimyō* Mōri Motonori (1000 *chō* or 2450 acres in 1881), final Saga domain *daimyō* Nabeshima Naohiro (375 *chō* or 920 acres in 1881), and final Daishōji domain *daimyō* Maeda Toshika (2533 *chō* or roughly 6200 acres in 1884) also acquired estates in Hokkaido. Inoue's Big Farming Proposal can thus also be seen as a debate about how best to organize the lands consolidated under these (and other) massive land transactions in the north. Hatate Isao, *Nihon ni okeru dainōjō no seisei to tenkai* (Tokyo: Ochanomizu shobō, 1963), pp. 18-19.

¹⁰ Tokyo Imperial University professor of agronomy Yokoi Tokiyoshi was the foremost early twentieth century proponent of small farming (*shōnō*). In writings like *Shōnō ni kan suru kenkyū* (Research on Small Farming, 1927), Yokoi put forward cultivator-owned small farms as a way to avoid the ills of industrial capitalism by keeping farm labor within a single household (while by the same token avoiding the strife that accompanied land tenancy arrangements). Small farms and the villages that supported them formed the bases of Yokoi's conception of "agriculture-as-base-ism" (*nōhonshugi*). To be sure, this was a very different formulation from the estate-driven agriculture espoused by Inoue Kaoru in the 1880s. Stephen Vlastos, "Agrarianism without Tradition: The Radical Critique of Prewar Japanese Modernity," in Stephen Vlastos, ed., *Mirror of Modernity: Invented Traditions of Modern Japan* (Berkeley: University of California Press, 1998), pp. 83-87.

return to their fields.¹¹ Big farming, all agreed, entailed the formation of larger landholdings than anything commonly found in the islands of Honshū, Kyūshū, or Shikoku. Its supporters looked to new frontiers at the edges of the young Japan empire as spaces where centralized agricultural and ranching estates might rival counterparts in the United States and Europe. Many including Inoue envisioned the laboratory of big farming first in the vast state-claimed tracts found in the northern island of Hokkaido, whose integration into the Meiji state was itself a consequence of a much longer process of warfare between Ainu peoples and Japanese settlers, colonization, and sweeping legal and social reform.¹²

In spite of its splashy entrance, the Meiji dream of big farming subsided (though was not completely extinguished) a few decades after Inoue brought it to wider attention. Histories of “Japanese” agriculture instead describe a trajectory in which certain cultivators rose to wealth and increased social prominence from the mid-eighteenth century onward. In English-language scholarship, Thomas C. Smith famously charted an agrarian path to Japanese industrial modernity, one in which wealthy agriculturalists

¹¹ See the summary in Ogura Takekazu, *Can Japanese Agriculture Survive?: A Historical and Comparative Approach* 3rd ed. (Tokyo: Agricultural Policy Research Center, 1982), pp. 25-32; see also Thomas R. H. Havens, *Farm and Nation in Modern Japan: Agrarian Nationalism, 1870-1940* (Princeton: Princeton University Press, 1974).

¹² Competing notions of big farming soon appeared. Arahata Katsumi, “Inoue Kaoru no ‘Dainōron’ o megutte,” *Nōgyō keizai kenkyū* v. 68 n. 3 (December 1996), pp. 143-153; Ōsaki Keiji, “Meiji 20 nendai ni okeru Sapporo Nōgakkō no daihyōteki nōron: kiboron o chūshin to shite,” *Hokkaidō daigaku nōkei ronsō* v. 29 (February 1973), pp. 108-127; Brett Walker, “Meiji Modernization, Scientific Agriculture, and the Destruction of Japan’s Hokkaido Wolf,” *Environmental History* v. 9 n. 2 (April 2004), pp. 248-274. Wendy Matsumura notes that plans for large scale sugar plantations financed by mainland Japanese capital, organized around sugar processing buyers, and farmed by tenants faced numerous difficulties in Okinawa prefecture in the face of local resistance. Wendy Matsumura, *The Limits of Okinawa: Japanese Capital, Living Labor, and Visions of Community* (Duke University Press, 2015).

moved from direct cultivation of their lands toward activities like moneylending, sake brewing, and silk buying.¹³ Smith and others saw in Tokugawa Japan the emergence of an economy—later described, in conversation with work in the field of early modern European history, as “protoindustrial. Local production supplied non-local markets but was not accompanied by the wholesale commodification of human labor or the substitution of machines for hands in the production process.”¹⁴ Smith saw these changes in tandem with the intensification of land use at the level of the family: “circumstances now favored the family-sized farm and strongly penalized any larger unit.”¹⁵ Throughout the mid-nineteenth century, regional economies transformed as new opportunities for domestic and overseas trade appeared. Historians located the driving forces of proto-industrialization in rural elites later characterized by scholars in Japan as a socioeconomic class of “wealthy cultivators” (*gōnō*).¹⁶ *Gōnō* served as shorthand for the potential of (though not the inevitability of) industrialization in the country rather than in the city: not in large landed estates but rather in activities like sericulture, brewing, and textile weaving that could be financed, at least initially, by rents paid in kind or, increasingly, in cash. Some of the landowners later identified as *gōnō* took it upon themselves to

¹³ Thomas C. Smith, *The Agrarian Origins of Modern Japan* (Stanford: Stanford University Press, 1959).

¹⁴ David L. Howell, *Capitalism from Within: Economy, Society, and the State in a Japanese Fishery* (Berkeley: University of California Press, 1995), pp. 9-16.

¹⁵ Smith, *The Agrarian Origins of Modern Japan*, p. 125.

¹⁶ Edward Pratt provides a valuable summary of these developments in *Japan's Protoindustrial Elite: The Economic Foundations of the Gōnō* (Cambridge: Harvard University Asia Center, 1999).

disseminate—in person and in print—information about cultivation methods, frugal living, and other forms of everyday economic advice.¹⁷

The historiography of rural protoindustrial efflorescence reaches its limits in the early twentieth century, when many of Japan's nineteenth century rural elites found that the bases of their social position had eroded. Over time, government-sponsored institutes and the rise of urban industries circumscribed the activities of the landowning elite. Divisions grew starker amid the Japan's boom years during the First World War and the bust that followed.¹⁸ Some owner-cultivators lost everything; others leased what lands they owned to tenant farmers; and new buyers acquired lands of their own.¹⁹ The problems of tenancy and rents became a key focus of debate among Japanese Marxist scholars over the nature of capitalism in Meiji Japan, in what proved to be one of the longest-running historiographical debates in twentieth century Japan. Sharp historiographical divisions appeared: rural elites could serve historians both as the facilitators of nineteenth century proto-industry (and, in some cases, as the rural

¹⁷ Thomas C. Smith, "Ōkura Nagatsune and the Technologists," in *Native Sources of Japanese Industrialization, 1750-1920* (Berkeley: University of California Press, 1988), pp. 173-198.

¹⁸ Pratt, *Japan's Protoindustrial Elite*. The wartime boom put new attention on so-called "nouveaux riches farmers" (*hyakushō narikin*) who speculated on stocks and other investments and lent out money to nearby acquaintances on the side. Rising rice prices contributed to nationwide rice riots (*kome sōdō*) in 1918 among those who bought rice on the market; attendant rising land prices (and rising rents) made tenancy increasingly precarious. This in turn propelled "*shōnō* protection"—that is, the regulation of tenancy arrangements and the fostering of smallholding owner-cultivators—to the fore as a focus of Japanese state agricultural policy in the 1920s. Wendy Matsumura, "The Expansion of the Japanese Empire and the Rise of the Global Agrarian Question after the First World War," in Alexander Anievas, ed., *Cataclysm 1914: The First World War and the Making of Modern World Politics* (Brill, 2015), pp. 150-154. On *narikin* and riots, see Louise Young, *Beyond the Metropolis: Second Cities and Modern Life in Interwar Japan* (Berkeley: University of California Press, 2013), chapter 1.

¹⁹ Pratt, *Japan's Protoindustrial Elite*.

forefathers of an industrial revolution and the rise of a proletariat) as well as the twentieth century's "parasitic landlords" who derived their income from absentee rents alone and made little effort to invest in industrial enterprise (and who had hence stalled possibilities of industrialization and, at a future date, socialist revolution).²⁰ Had older, "feudal" patterns of landholding remained in Meiji Japan? Questions like why landowners chose to rent out their lands rather than cultivate them directly or why tenants became unsatisfied with tenancy arrangements came to the fore.²¹ These questions had very large implications for debates on Japanese capitalism but focused, for the most part, on landowners who leased out very small plots of land.

The modern vocabulary of large farming units in the Japanese language reflects a lingering sense of exogeneity. The plantation—or rather, the *purantēshon*, a loanword that gained currency as a way to describe export-oriented agricultural organization in the British, French, and Dutch Asian empires, areas at the southern edge of post-1941 Japanese wartime expansion—is not something associated with the redrawn boundaries of post-World War II Japan.²² With the end of World War II, land reforms pushed

²⁰ Andrew E. Barshay, *The Social Sciences in Modern Japan: The Marxian and Modernist Traditions* (Berkeley: University of California Press, 2004), pp. 72-174; Yasukichi Yasuba, "Anatomy of the Debate on Japanese Capitalism," *Journal of Japanese Studies* v. 2 n. 1 (Autumn 1975), pp. 63-82.

²¹ For example, Anne Waswo and Richard Smethurst both argued against interpretation of parasitic landlords and destitute tenants, even as both posed agrarian questions in terms of the landlord-tenant relationship. See Anne Waswo, *Japanese Landlords: The Decline of a Rural Elite* (Berkeley: University of California Press, 1977); Richard J. Smethurst, *Agricultural Development and Tenancy Disputes in Japan, 1870-1940* (Princeton: Princeton University Press, 1986).

²² Japanese geographers were at the forefront of this terminological shift. Bekki Atsuhiko, the Kyoto University-trained author of one of the first global surveys of "the plantation" published in Japanese, headed surveying work in wartime Java. Bekki Atsuhiko, *Purantēshon* (Tokyo: Kokon shoin, 1966). Bekki's work came on the heels of related efforts in Japan to study "New World" slavery and plantation systems. See economic historian Shimomura Taisuke's study of American cotton farming "from slave plantation to fully mechanized cultivation," *Amerika no menka saibaishi: dorei purantēshon yori kanzen kikaikanō ni itaru*

through under the American-led Occupation favored smallholder landowners over absentee landlords. Hazy memories of Meiji big farming faded further from view, not only because most landowners had rented out their lands before the war instead of managing them directly, but also because after the war many such landowners ceased to exist as such.²³ If capital-intensive big farming could be identified anywhere, it was along the Japanese empire's Pacific periphery.²⁴ Japanese-owned plantations, sometimes referred to at the time as "overseas Japanese plantations" (*hōjin purantēshon*) and later characterized in the post-World War II terms of Japanese-language *purantēshon* studies, appeared as

menka keizai no tenkai (Nihon menka kyōkai, 1960). Bekki and others in Japan also saw agrarianist Tsurumi Sōnosuke's Japanese translation of Vera Rubin's 1959 edited volume *Plantation Systems of the New World*, entitled *Shin sekai no purantēshon* (Nōrin suisangyō seisan kōjō kaigi, 1965).

²³ The 1946 reforms limited the area of tenantable land to 4 *chō* (1 *chō* is about 1 hectare, or 2.45 acres) in Hokkaido and an average of 1 *chō* elsewhere (depending on the prefecture). Total individual land ownership was limited to 12 *chō* in Hokkaido and an average of 3 *chō* elsewhere (again, depending on the prefecture). Dore, *Land Reform in Japan*, p. 138. Hokkaido remained a part of Japan where larger farms could be found, but alternatives to large-scale "American-style" dairy farming, including Danish-inspired plans for small-scale production, had begun to appear by the 1930s. See Robert Stolz, *Bad Water: Nature, Pollution, and Politics in Japan, 1870-1950* (Durham: Duke University Press, 2014), chapter 5.

²⁴ Struggling tenant farmers (including many from Okinawa) migrated overseas to work as wage labor on large agricultural enterprises outside the empire: Hawai'i, Brazil, and the Philippines, to name some of their most frequent destinations. The first migrants to Hawai'i arrived in 1868. After 1885 they arrived through Japanese government-authorized emigration recruitment companies; as with many of the earlier arrivals, most came to Hawai'i on three-year contracts to work in sugar plantations. In 1900 the United States ended the contract system, at which point large numbers of the Hawai'i migrants went onward to the West coast of the American mainland until the 1907-1908 "Gentleman's Agreement," which drastically curtailed Japanese immigration to North America. The agreement came on the heels of 1901 Australian restrictions on Japanese immigration. It was not coincidental that the first Japanese immigrants to Brazil arrived in 1908 as contract laborers in the country's coffee plantations. Nearly 200,000 Japanese went to Brazil through 1941. Prewar migration to the Philippines centered on Davao in the southern island of Mindanao. Yukiko Kimura, *Issei: Japanese Immigrants in Hawaii* (Honolulu, University of Hawai'i Press, 1992), pp. 3-22; Daniela de Carvalho, *Migrants and Identity in Japan and Brazil: The Nikkeijin* (New York: Routledge, 2003); Grant K. Goodman, *Davao: A Case Study in Japanese-Philippine Relations* (University of Kansas, 1967). In the 1930s Manchuria became part of even grander imperial plans to bring Japanese farming settlers to the Asian mainland. See Louise Young, *Japan's Total Empire: Manchuria and the Culture of Wartime Imperialism* (Berkeley: University of California Press, 1998).

relics of what in retrospect looked like a case of short-lived and foolhardy expansion.²⁵ A transwar Japanese relationship to plantation agriculture and other modes of big farming was recast as the twinned phenomena of 1) overseas investment in (and substantial development aid to) Southeast Asian countries that in many cases had once, however briefly, formed a part of the Japanese empire and 2) the rising domestic demands that accompanied Japan's postwar economic boom. The more recent formation of large, export-oriented agricultural units outside present-day Japan, above all in postcolonial Southeast Asia, could be seen in this light as a repackaging of earlier imperial developmentalist schemes as well as a newer response to burgeoning Japanese consumer desires for cheap lumber, fruit, and seafood.²⁶

²⁵ For an example of *hōjin purantēshon*, see Iizawa Shōji, *Nan'yō seisaku no saininshiki* (Takayama shoin, 1939), p. 128. Hiraoka Akitoshi used Bekki Atsuhiko's formulation of the *purantēshon* to describe sugar cultivation in the Okinawan Daitō Islands in "Daitō shoto no kaitaku to purantēshon keiei: sono rekishiteki tenkai o chūshin ni shite," *Jinbun chiri gakkai* v. 29 n. 3 (1977), pp. 227-252. New English-language studies of plantation production in the Japanese empire are increasing. On cinchona tree cultivation in colonial Taiwan see, for example, Tim Yang, "Selling an Imperial Dream: Japanese Pharmaceuticals, National Power, and the Science of Quinine Self-Sufficiency," *East Asian Science, Technology, and Society* v. 6 n. 1, pp. 101-125. However, Japanese colonial government efforts to preserve existing agrarian land tenure relations militated against newcomer plantation entrepreneurs in some parts of the empire. In Taiwan, for example, the colonial government "eschewed the establishment of sugar plantations in which the company owned the land and controlled the growing, harvesting, and processing of the sugar. Instead, the colonial government allowed for small families to own land while securing supplies of sugarcane by contracts and laws requiring land designated for sugarcane cultivation to grow the necessary sugarcane to supply factories." Corporate-owned sugar plantations (and, as we will see in Chapter 4 of this dissertation, pearl farms) did emerge from the 1910s onward in the South Pacific islands that would form Japan's South Seas (*Nan'yō*) mandate territories after 1919. Ti Ngo, "Mapping Economic Development: The South Seas Government and Sugar Production in Japan's South Pacific Mandate, 1919-1941," *Cross-Currents: East Asian History and Culture Review* n. 2 (March 2012), pp. 7, 11-12. On large-scale cultivation in the Ogasawara Islands, see Colin Tyner, "Struggling with Complex Natures in the Ogasawara Islands," in *Environment and Society in the Japanese Islands: From Prehistory to the Present*, edited by Bruce L. Batten and Philip C. Brown (Oregon State University Press, 2015).

²⁶ Literature that touches upon relationships among post-World War II Japanese consumers, the global circulation of Japanese capital, and the rise of implicitly extra-Japanese plantations is extremely rich. Of value to the framing of this project have been Tsurumi Yoshiyuki, *Banana to Nihonjin: Firipin nōen to shokutaku no aida* (Tokyo: Iwanami shoten, 1982); Murai Yoshinori, *Ebi to Nihonjin* (Tokyo: Iwanami shoten, 1988) and *Ebi to Nihonjin 2: Kurashi no naka no gurōbaruka* (Tokyo: Iwanami shoten, 2007); Derek Hall, "The International Political Ecology of Industrial Shrimp Aquaculture and Industrial Plantation

The Meiji idea of big farming and subsequent understandings of plantation agriculture now appear as phenomena that never quite took off, either before or after World War II, in the lands encompassed by the post-1945 boundaries of Japan.²⁷ We should not, however, take this either as a natural outcome of Japanese resource scarcity or of the ecological impossibility of large agricultural units in the archipelago.²⁸ As the American sociologist Edgar Thompson put it in a seminal 1930s study, “the plantation organization of agricultural industry is largely concentrated in the tropical zone, not because of climate, but because tropical regions constitute the most important and most accessible frontier of the world community.”²⁹ One of Thompson’s key insights, taken up by scholars like Sidney Mintz in the mid-twentieth century, was to consider plantations first and foremost as political institutions forged from the creation of markets that put prices on land, sea, labor, and money itself, rather than as logical outgrowths of natural advantages. Others, too, separated the plantation from slave labor, arguing that plantation production had existed under (and had helped to produce) multiple forms of

Forestry in Southeast Asia,” *Journal of Southeast Asian Studies* v. 34 n. 2 (June 2003), pp. 251-264; and Anna L. Tsing, *Friction: An Ethnography of Global Connection* (Princeton University Press, 2011).

²⁷ This can be attributed in part to tendencies to equate Japanese cultivation with small wet rice paddy farms and to downplay the extent of commercial agriculture elsewhere in Japan, as Francesca Bray notes in *The Rice Economies* (New York: Basil Blackwell, 1986), p. 213.

²⁸ Eric Dinmore, “A Small Island Nation Poor in Resources: Natural and Human Resource Anxieties in Trans-World War II Japan” (PhD diss., Princeton University, 2006); Satō Jin, “*Motazaru kuni*” *no shigenron : jizoku kanō na kokudo o meguru mō hitotsu no chi* (Tokyo: Tokyo Daigaku Shuppankai, 2011).

²⁹ A reprint of Thompson’s 1932 dissertation, along with an introduction by Sidney Mintz and George Baca, can be found in Edgar T. Thompson, *The Plantation* (Columbia: University of South Carolina Press, 2010). The quoted text is from p. 8.

labor control.³⁰ Underlying Japanese historiographical debate and its many subsequent critiques, moreover, was a persistent conceptual distinction between agriculture and industry. Yet cultivation was not inherently antithetical to industry; to the contrary, as Mintz and others showed, the provisioning of inexpensive and plentiful commodities not only facilitated the growth of factory workforces in other parts of the world, but could itself be organized along similarly factory-like lines.³¹

This dissertation illuminates an alternative history of big farming and export cultivation in the Japanese empire: not on land, but in coastal waters. It is a history that began at the turn of the twentieth century with the redefinition of saltwater frontiers susceptible to new cultivating claimants and the application of industrial property rights—in the form of patents—to the manipulation of living creatures. Chapters One and Two together address how techniques of working with pearl oysters at the level of shellfish populations and at the level of individual shellfish emerged at a confluence of monopoly rights authored in Mikimoto's name. The law of fisheries and the law of patents enshrined claims of human intervention as the basis for the ownership of private property. State-authorized fisheries rights delineated areas over which individuals could claim exclusive control over ocean space for the purpose of raising aquatic creatures.

³⁰ See César Ayala, *American Sugar Kingdom: The Plantation Economy of the Spanish Caribbean, 1898-1934* (University of North Carolina Press, 2009).

³¹ Sidney W. Mintz, *Sweetness and Power: The Place of Sugar in Modern History* (Penguin, 1986); John Soluri, *Banana Cultures: Agriculture, Consumption, and Environment in Honduras and the United States* (Austin: University of Texas Press, 2009); César Ayala, *American Sugar Kingdom: The Plantation Economy of the Spanish Caribbean, 1898-1934* (University of North Carolina Press, 2009). For the place of mechanization in American agriculture, see Deborah Kay Fitzgerald, *Every Farm a Factory: The Industrial Ideal in American Agriculture* (New Haven: Yale University Press, 2003).

State-authorized patent rights, integrated after 1899 into the international Paris Convention for the Protection of Industrial Property, described inventions over which individuals could claim exclusive authorship. Mikimoto, the first man to take advantage of both of these legal regimes, did so in order to sell pearls for export. In so doing he became, for a few decades, the largest individual holder of exclusive saltwater cultivation rights in the Japanese empire.

It should not surprise us that some of the most vigorous late-nineteenth century Japanese state claims to land and sea fell under the realms of forestry and fisheries.³² Both were part of trends in continental Europe, the United States, and far-flung colonial territories to reform and divide a wide range of spaces that had formerly been used in common.³³ But pearl cultivation was personalized to an extent not seen in mountains and waters elsewhere in the Japanese empire. At the turn of the twentieth century, Mikimoto had become a new kind of imperial client: the holder of a network of saltwater estates enabled by monopolies enshrined in national and international legal regimes. This was not itself a new development: Japanese shorelines in the Tokugawa period had been spaces on which certain kinds of exclusive claims could be made.³⁴ But early twentieth

³² See Conrad Totman, *Japan's Imperial Forest: Goryōrin, 1889-1946* (Global Oriental, 2007).

³³ John C. Weaver, *The Great Land Rush and the Making of the Modern World, 1650-1900* (McGill-Queen's University Press, 2003). See also Keiner, *The Oyster Question: Scientists, Watermen, and the Maryland Chesapeake Bay since 1880*; McCay, *Oyster Wars and the Public Trust*; and Takahashi, "Shigen hanshoku no jidai" to Nihon no gyogyō. Several decades of research have led to an understanding of "the commons" as intricately (and, usually, locally) governed, spaces. Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge University Press, 1990); and, for Japan more specifically, Margaret A. McKean, "Common-Pool Resources in the Context of Japanese History," *World Wide Business Review* v. 5 n. 1 (July 2003), pp. 132-159.

³⁴ Arne Kalland, *Fishing Villages in Tokugawa Japan*. For a broader discussion of land use, see Philip C. Brown, *Cultivating Commons: Joint Ownership of Arable Land in Early Modern Japan* (Honolulu: University

century enclosure took on a different kind of double meaning. In one sense, Mikimoto could (and did) claim cultivation rights in waters that ranged from Ishikawa Prefecture's Nanao Bay in the north to Palau's Koror Bay in the southern Pacific Ocean. In a second sense, techniques for surgically manipulating the shellfish that lived within those plots became candidates for patents based upon claims of novel human intervention.

Chapter 1 follows the environmental and social transformation of an inlet known as Ago Bay, as its coastal economy shifted from the gathering of edible sea creatures for consumers in Qing China to the cultivation of pearls for consumers in Europe and the United States. In the 1880s, Mikimoto Kōkichi found himself in the middle of a late-nineteenth century problem and its purported solution: enormous demand for exportable marine products from Chinese and European treaty port merchants in Yokohama and Kobe, and the rise of state-led coastal conservation policies.³⁵ Amid wider reconceptualizations of fisheries as spaces of capital investment, Mikimoto forged alliances with Tokyo-based zoologists and Meiji government elites. With an eye to earlier indigenous traditions of coastal surveying and experimental breeding, imperial officials looked closely at the economic applications that might arise from studying the development and life cycles of locally available shellfish and other marine creatures that could be disassembled, processed, and graded as export commodities. The fisheries

of Hawai'i Press, 2011). The seminal English-language study of early modern Japanese forestry, with its argument that fears of overcutting impelled the regulation of (and, by domain governments and their favored clients, the plantation cultivation of) forests, resulting not in the collapse of Japanese wood supplies but rather a "green archipelago," is Conrad Totman, *Green Archipelago: Forestry in Pre-Industrial Japan* (Berkeley: University of California Press, 1989).

³⁵ Takahashi Yoshitaka makes this point in "*Shigen hanshoku no jidai*" to *Nihon no gyogyō*.

science that they supported amalgamated market regulation and local governance. One outcome of this was that the sometime marine products buyer Mikimoto Kōkichi became a protector of pearl oysters. Mikimoto gained control of coastlines under a model of exclusive access to state-claimed waters. In so doing, he became not only someone who promised to defend pearl oysters from a newly defined problem of the “reckless gathering” of exportable marine creatures, but also someone who shaped the productivity of pearl-bearing shellfish in terms of both Western demand and the Japanese imperial household’s efforts to incorporate Western modes of aristocratic display. The proximity of Ago Bay and neighboring Gokasho Bay to Ise, the site of frequent imperial pilgrimages from the capital in Tokyo, helped to spark Mikimoto’s longstanding and well-publicized personal relationships with the imperial household. The patronage of the Meiji and Taishō emperors contributed to Mikimoto’s designation in 1924 as official supplier of pearls to the future Emperor Hirohito—a title Mikimoto styled in domestic and foreign advertisements as “Court Jeweler.”³⁶ Mikimoto’s pearls adorned imperial crowns and awards while also going abroad by the millions.

Mikimoto’s power took the institutional form of pearl farms that appeared on the coasts of the Japanese empire. Mikimoto lived in Mie prefecture, a political unit that stabilized in the first decade of the Meiji state, but he proclaimed leadership along coasts that overlapped with the older boundaries of the former imperial province of Shima.

³⁶ Takashi Fujitani, *Splendid Monarchy: Power and Pageantry in Modern Japan* (Berkeley: University of California Press, 1996); Sally A. Hastings “The Empress’ New Clothes and Japanese Women, 1868-1912,” *The Historian* v. 55 n. 2 (June 1993), pp. 677-692. One of Mikimoto’s “Court Jeweler” advertisements can be found in the *Yomiuri Shinbun*, December 11, 1928.

Mikimoto's farms in Mie/Shima molded a region abutting Ise, the Japanese empire's most important Shintō shrine, in the shape of Western desires. His headquarters in turn became a model for intensively-farmed coastlines along shores in the Japanese empire and overseas, even as it became ground zero for a new appreciation of the threats posed by saltwater itself to the monoculture of living creatures.

Nevertheless, imperial patent and cultivation rights—along with the idea that big saltwater farms were inherently better than smaller saltwater farms—became subject to intense dispute within the Japanese empire as the pearl cultivation economy grew. Many outside Mikimoto's company criticized new ways of using coastlines, new ways of claiming industrial property rights involving living creatures, and new ways of organizing overseas trade. They did so not only because monopolies threatened livelihoods that existed outside the sphere of cultivation, but also because some of them wanted to attempt cultivation for themselves. The latter struggled to show the priority of their uniquely authored claims for intervening in the lives of pearl oysters, whether at the scale of the population (as with cultivation rights issued as one means to stem declining numbers of exportable marine creatures) or the individual organism (as with patents that covered surgical manipulations of a single shellfish, multiplied by the number of suitable bivalves living under spaces defined by cultivation rights).

If we think about them at all, we probably imagine that pearl oysters lead relatively sedentary lives. They might pass through a free-swimming juvenile period and might even move around a little as adults,³⁷ but eventually they find something to which their

³⁷ So observed the Tokyo Imperial University-trained zoologist Nishikawa Tōkichi in 1898: even after free-

sticky byssus threads can cling on the seafloor. The coastal waters in which they reside, moreover, are sometimes hastily characterized as fuzzy border areas that, distinct from ownable terrestrial lands, are closer to an unclaimable aquatic free-for-all.³⁸ But to look at coastal waters like a pearl cultivator was to be in search of long-term pearl oyster homes. Whether we term them capital or biocapital, we must consider living oysters³⁹ the way Mikimoto (and, before long, other pearl cultivators in the Japanese empire) did: as creatures that grew and aged but that—if prodded in the right ways, and at the right ages—could yield substantial financial returns.⁴⁰ Though not liable to travel far on their own, pearl oysters were a cultivator’s most mobile assets. Cultivators moved shellfish to

swimming juveniles of the *akoyagai* variety had seemingly fixed themselves in place, they still had some limited means of locomotion. Nishikawa Tōkichi (signed “Ni To”), “Shinjugai no idō,” *Dōbutsugaku zasshi* v. 10 no. 121 (November 15, 1898), p. 407.

³⁸ Bonnie McCay makes this point in “The Littoral and the Liminal: Challenges to the Management of Coastal and Marine Commons,” *Maritime Studies* 7 (no. 1, 2008): 7–30. Work in Japanese and Pacific contexts includes Kenneth Ruddle and Tomoya Akimichi, *Maritime Institutions in the Western Pacific* (Osaka: National Museum of Ethnology, 1984); David Howell, *Capitalism from Within: Economy, Society, and the State in a Japanese Fishery* (Berkeley: University of California Press, 1995); Arne Kalland, *Fishing Villages in Tokugawa Japan* (Honolulu: University of Hawaii Press, 1995). For scholarship focusing on the United States, see Arthur F. McEvoy, *The Fisherman’s Problem: Ecology and Law in the California Fisheries, 1850–1980* (Cambridge University Press, 1986); Bonnie J. McCay, *Oyster Wars and the Public Trust: Property, Law, and Ecology* (Tucson: University of Arizona Press, 1998); Christine Keiner, *The Oyster Question: Scientists, Watermen and the Maryland Chesapeake Bay since 1880* (Athens, Ga.: University of Georgia Press, 2010); Matthew Morse Booker, *Down by the Bay: San Francisco’s History between the Tides* (Berkeley: University of California Press, 2013); Connie Y. Chiang, *Shaping the Shoreline: Fisheries and Tourism on the Monterey Coast* (Seattle: University of Washington Press, 2008); James Acheson, *The Lobster Gangs of Maine* (Hanover, N.H.: University Press of New England, 1988).

³⁹ “Oyster” and “pearl oyster” are historically (but not always zoologically) accurate ways of referring to pearl-bearing shellfish that are more closely related to mussels than edible oysters. Discussion of edible oysters in the text will be prefaced with the “edible” modifier for clarity.

⁴⁰ For a helpful discussion of the many permutations by which an array of political and economic understandings of value and living creatures—above all, Marxian formulations of capital and Foucauldian notions of biopower and governmentality—have come under the rubric of “biocapital,” see Stefan Helmreich, “Species of Biocapital,” *Science as Culture* v. 17 n. 4 (2008), pp. 463–478. Similar themes appear as well in Susan Schrepfer and Philip Scranton, eds., *Industrializing Organisms: Introducing Evolutionary History* (Routledge, 2004).

and from bays across Japan and throughout the Pacific, along with technical know-how embedded in human and invertebrate bodies. Without easy methods for breeding shellfish in the early twentieth century, all Japanese cultivators relied on hired help to collect pearl oysters. Pearl cultivation necessitated the employment of seasonal squads of boatmen, helmet-equipped “dress” divers, and the predominantly female breath divers, known as *ama*, who would together gather, plant, and recollect pearl oysters of a suitable size from within a single demarcated fishery—or even sometimes from farther-flung shores outside imperial Japan’s legal jurisdiction. One byproduct of individual fishing rights ownership and regional markets for the trade in living pearl oysters was the use of terrestrial botanical metaphors—seed oysters (*tanegai* 種貝), seedlings (*shubyō* 種苗), transplants or grafts (*ishoku* 移植), and the terminology of landed gardens—to describe the spaces, practices, and creatures involved in pearl cultivation.⁴¹ Another byproduct was that Japanese criminal courts confirmed that pearl oysters (and, by extension, other kinds of creatures) located within spaces zoned for marine cultivation had the same legal status as livestock on land.⁴²

⁴¹ While my argument focuses more on the legal apparatus supporting saltwater cultivation, landed agriculture does not work as a complete analogue when thinking about shellfish cultivation in practice. Referring to the east coast of the United States, Bonnie J. McCay has called edible oyster cultivation “a truncated form of aquaculture, elevated to the level of farming more by the use of agricultural jargon than practice.” Even so, terminological issues shaped Japanese practices of pearl cultivation in formative ways, as the following chapters show. See Bonnie J. McCay, “Nature, Culture, and the Law in New Jersey’s Shellfisheries,” Presentation at the Annual Meeting of the American Anthropological Association (December 4-7, 1982).

⁴² For a case in which the unauthorized taking of pearl oysters from a demarcated fishery was ruled to be theft, see “Settō hikoku jiken,” *Daishin’in keiji hanreishū* [v. 5] (1925), pp. 603-605.

Mikimoto and other Japanese pearl cultivators talked about their shellfish in a gendered language of productivity. A pearl oyster that had reached three years of age was known as a “mother oyster,” or *bogai* 母貝. A mother oyster was deemed ready to undergo a surgical process for inducing a pearl inside it. By the time of the First World War, cultivators in Japan were harvesting the outer soft tissues of freshly killed shellfish and transplanting them into living mother oysters along with spherical nucleating objects around which the transplanted tissues would secrete shell material to form a pearl. The late 1920s also saw the practice of removing a shellfish’s egg- or sperm-containing gonads and replacing them with even larger nucleating spheres to produce even larger pearls.⁴³ Making mother oysters into more efficient pearl producers sometimes meant rendering them incapable of reproduction altogether. Pearl cultivation brought with it the problem of teaching oneself, and training other surgical technicians, in the art of cutting into living (and dead) shellfish. However, this was only the beginning of several years of waiting and watching over surgically manipulated mother oysters. Keeping a mother oyster alive until it might yield a pearl meant watching over the waters in which it lived—a task which was until the 1930s most often assigned to skilled female divers.

Legal issues continually intersected with coastlines and mother oysters. Chapter 2 shows how legal conflict over Mikimoto’s first 1896 patent for the cultivation of semi-spherical pearls tested the limits of industrial property’s capacity to include living creatures under Japanese patent law. The scramble for patents meant that determinations of individual authorship also determined the scope of monopoly claims. Mikimoto’s legal

⁴³ Tange Makoto, “Shinju yōshoku ni okeru gijutsu no kōzō: jō.”

counsel expended significant energies to establish multiple and at times overlapping claims over ways of using ocean space and living shellfish. Favorable patent court rulings in several long-running disputes over Mikimoto's first patent solidified Mikimoto's reputation as one of Japan's first imperial inventor figures, even as the techniques covered by that patent were revealed to have origins in southern China and a global circulation in print. With other routes to industrial property made available, Mikimoto and his competitors in Japan claimed a second generation of patents for the cultivation of spherical pearls—which his competitors licensed to pearl farmers big and small.

The World of “Oriental” Pearls

If this is a story of big farming and export cultivation, it is nevertheless not simply a story of mass production and mass consumption. From the start, Mikimoto's exclusive claims were part of an attempt to join a global wave of speculative interest in pearls that was predicated upon a semblance of rarity. By the nineteenth century across much of Europe, the descriptive term “orient” referred to the surface qualities of certain kinds of saltwater pearls. Orient was an amalgam of the exotic, the rare, and the ornamental—as defined, primarily, by European connoisseurs.⁴⁴ It was a combination, moreover, that manifested itself at the surface. Wherever an “oriental” went, it could be judged and evaluated by sight. What this meant was that the pricing of a pearl was an act of connoisseurship that began with an examination of exterior forms rather than a specific attribution of

⁴⁴ This is related to a broader phenomenon of cultural representation diagnosed by Edward Said in *Orientalism* (New York: Pantheon Books, 1978).

provenance. Oriental pearls were objects of keen speculation during the first two decades of the twentieth century in Europe and the United States. George Kunz of Tiffany & Co. diagnosed British speculation as a cause of rising prices from 1898 to 1905, “because at that time, in England, money could be borrowed upon a very low rate of interest—as low as 3 per cent—and it was a temptation to a number of young men to enter as dealers into the pearl trade.”⁴⁵ To the consternation and puzzlement of British fisheries officials, after around 1905 the major British controlled fishery in Ceylon (present-day Sri Lanka) ceased to yield sizable numbers of pearls for twenty years.⁴⁶ The world’s largest pearl fishery in the Persian Gulf did not bring up the slack. As Kunz put it in 1908, “Pearls of one hundred grains [twenty-five carats] are even more rare at the present time than are diamonds of one hundred carats.”⁴⁷

⁴⁵ George F. Kunz and Charles H. Stevenson, *The Book of the Pearl: Its History, Art, Science and Industry of the Queen of Gems* (New York: The New York Century Co., 1908), p. 358.

⁴⁶ This came on the heels of substantial nineteenth-century periods during which few if any pearl-bearing shellfish had been found. See Hightower, “Pearls and the Southern Persian/Arabian Gulf,” p. 54, note 6.

⁴⁷ Kunz and Stevenson, *The Book of the Pearl*, p. 330.



A rush to locate bivalves with salable pearl and shell extended to rivers, lakes, and above all coastlines across the nineteenth century world.⁴⁸ In 1919, the French broadsheet *Le Matin* published a chart that inadvertently depicted this global boom in pearl oyster gathering.⁴⁹ The chart showed a single strand of pearls, along with a list of the prices that had attended its sale. The necklace had sold for 2,500 francs in 1824, but at each one of the five subsequent times it had changed hands, the price of the necklace had risen, with a marked upward swing from 1890 onward. Most recently the necklace had fetched 250,000 francs, a hundred-fold increase from its initial sale price. The chart's final entry

⁴⁸ See, for example, John Butcher, *The Closing of the Frontier: A History of the Marine Fisheries of Southeast Asia, c. 1850-2000* (Singapore: Institute of Southeast Asian Studies, 2004), pp. 124-135.

⁴⁹ *Le Matin*, 26 June 1919.

for 1925, six in years in the future, was a question mark that hinted at the escalating prices it might garner. Its title—“*La Monnaie Internationale: Les Perles*” (The International Currency: Pearls)—suggests something that we do not always associate with pearls nowadays. Strands of pearls were objects of adornment, but they were also objects of investment for the men (in the early twentieth century’s homosocial pearl wholesale markets) and women who believed them to be objects of substantial and rising value.

Comment le public voit.....



..... une pêcherie de perles.

A 1924 illustration in the Parisian luxury wholesaler journal *Le Grand Négocé* provides another glimpse of how wholesalers hoped retail buyers would view “oriental” pearls: as objects so obviously precious, and so little adulterated from seafloor to display case, that male (and turbaned) divers could pluck pre-strung pearl necklaces—one with a three million franc price tag already affixed—right out of bivalves in the water.⁵⁰ Nothing

⁵⁰ *Le Grand Négocé*, 1924.

more succinctly captured the notion that a pearl's form—and, under the logic of pearl evaluation, its value—existed in a predetermined and natural harmony.

The reality of high (and rising) pearl exchange values, however, was that substantial networks of merchants—after around 1908 in Europe, predominantly in Paris—made their livings determining the prices that would attach to pearls that arrived from waters across the world. A necklace was made from the sorting of pearls according to norms of color, size, and shape that privileged their display in series along silk threads. Even if some members of the public may have believed that necklaces and their prices were products of nature, the estimation of a pearl's value was a social act. So, too, was the ascription of a pearl's qualities, “oriental” or otherwise.

Naming the Products of Pearl Cultivation

*Culture is one of the two or three most complicated words in the English language.*⁵¹

*Nature is perhaps the most complex word in the language.*⁵²

As Raymond Williams suggests, we deal in complexity when we grapple with the many meanings of nature or culture. Our problems only compound when we consider the possibility of applying these already messy concepts to other linguistic traditions.⁵³

⁵¹ Raymond Williams, *Keywords: A Vocabulary of Culture and Society*, revised edition (New York: Fontana Paperbacks, 1983), p. 87.

⁵² Williams, *Keywords*, p. 219.

⁵³ Federico Marcon, *The Knowledge of Nature and the Nature of Knowledge in Early Modern Japan* (Chicago: University of Chicago Press, 2015).

Chapter 3 attends to a problem of nature and culture that emerged in Europe, but which was part and parcel of developments in the Japanese empire.

Mikimoto rose to prominence in the aftermath of an early 1880s ferment that Julia Adeney Thomas has boldly termed “the turning point in the development of the Meiji state, distilling definitions of nature and clarifying what was at stake.”⁵⁴ Thomas argues that wide-ranging ideas of nature, far from remnants of pre-modern Japanese thought, were at the center of debates over political life—until, by the end of the century, they weren’t, at least not under quite the same terms. By the 1890s, a limited (and still-current) cast of expressions denoting nature, most notably *shizen* 自然 but also *tennen* 天然, became the vocabulary of a pre-World War II merger of nationalism and nature. Nature shed many of its links to a mid-Meiji vogue of Social Darwinist comparison, competition, evolution, and hierarchy in favor of an immanent notion of Japanese nature. As a result, Thomas writes that from the late Meiji period onward “Japanese culture could begin to love nature without having to look outside itself.”⁵⁵ To say that Mikimoto was someone who, in the words engraved on a silver chalice given him by Prince Komatsunomiya Akihito in 1900, “used the works of man in order to aid the works of heaven” (*jinkō o motte tenkō o tasuku* 以人工助天工) was to invoke a *fin-de-siècle* understanding of the potential of human artifice to help heaven (*ten* 天), nature (*ten* 天 of *tennen* 天然) and

⁵⁴ Julia Adeney Thomas, *Reconfiguring Modernity: Concepts of Nature in Japanese Political Ideology* (Berkeley: University of California Press, 2001), p. 84.

⁵⁵ Julia Adeney Thomas, *Reconfiguring Modernity*, p. 176.

emperor (the *ten* 天 of *tennō* 天皇) simultaneously.⁵⁶ Images of Mikimoto as Pearl King presented him as a local cultivator of influence and as a hero of global commerce, but the Pearl King emerged alongside his role as Nature's Helper, a Japanese imperial subject who could protect and reengineer living creatures with the public blessings of the Meiji state.

What complicates a narrative of Mikimoto's place amid distinctly Japanese formulations of nature and culture is that the discourse surrounding the political, ecological, and social roles of pearl cultivation in the Japanese empire existed alongside an ongoing commercial dialogue about the products of cultivation in other places. The semi-spherical "culture pearls" that Mikimoto's salesmen first offered to English-speaking customers presented culture as a translation of *yōshoku* 養殖, a term used to describe practices of raising living creatures and, by the late nineteenth century, to describe freshwater and saltwater aquaculture more specifically.⁵⁷ The "culture" of a culture pearl

⁵⁶ Ototake Iwazō, *Denki Mikimoto Kōkichi* (Tokyo: Kōdansha, 1950), p. 99. In this case, the pairing of *jinkō* 人工 and *tenkō* 天工 was also part of a much longer textual tradition in China. The "works of heaven" denoted by *tenkō* formed the subject of the late Ming compendium *Tiangong kaiwu* 天工開物 (J. *Tenkō kaibutsu*), a landmark encyclopedic work compiled by Song Yingxing in 1637. The *Tiangong kaiwu* is notable both for the breadth of agricultural and craft practices it describes, which later served as an important source for Joseph Needham's *Science and Civilisation in China* series, as well as its passages on (and illustrations of) freshwater pearl diving in China. See Dagmar Shaffer, *The Crafting of the 10,000 Things: Knowledge and Technology in Seventeenth-Century China* (Chicago: University of Chicago Press, 2011). In a review of Julia Adeney Thomas's book, Sumiko Otsubo has suggested the potential for investigating a late nineteenth century convergence of "emperor," "heaven," and "nature" in the character *ten* 天. See Sumiko Otsubo, Review of *Reconfiguring Modernity: Concepts of Nature in Japanese Political Ideology* by Julia Adeney Thomas, *Technology and Culture* v. 44 (April 2003), p. 433.

⁵⁷ In contrast to "culture," which (in English and French translation) served as a spark for years of conflict, Mikimoto does not appear to have dwelt publicly on the valences of the term "pearl" itself, which in Japanese could indicate authenticity (*shinju* 真珠 as opposed to simply *tama* 珠/玉) or in Chinese rarity (*zhēnzhū* 珍珠 as opposed to simply *zhū* 珠). In older texts especially, the problem of distinguishing between signifier and signified for characters like *tama* 玉 that can, depending on context, refer to jade beads or pearls, is a tricky one. As the early twentieth century pearl cultivation economy grew—and, not coincidentally, as disputes about the priority of pearl cultivation methods erupted—compendia of pearl knowledge (including philological excavations of early Japanese texts like the *Nihon shoki* as well as compendia such as the Chinese *Bencao gangmu* and its Japanese successors like the *Honzō kōmoku keimō*)

was, in other words, based upon newly standardized imperial Japanese legal understandings of exclusively owned marine creatures and exclusively managed ocean space.⁵⁸ The cultivation described by *yōshoku* was, in its nineteenth century instantiation, less a claim of Japanese uniqueness than it was an idea of cultivation in a universal and civilizing sense, for it came to represent the fixed, controlled, and (according to many both inside and outside the Japanese empire) “agricultural” use of ocean space. In that sense, a “culture pearl” was a product of human mastery over the sea. Yet although legal distinctions between nature and artifice underlay the process of saltwater cultivation, Mikimoto also stressed that the product of cultivation was not the antithesis of nature. Harking back to his earlier imperial accolades, a “culture pearl” was “A Successful Case of Science Applied in Aid of Nature.”⁵⁹

began to appear in print in Japanese. One of these compendia subordinated Chinese and Western textual traditions into a trajectory of pearl history that started with—and crescendoed in—the Japanese empire, even as it tried to deflect credit away from Mikimoto. For this early example, patched together in large part from a series of articles published over several years in the zoological journal *Dōbutsugaku zasshi* and beginning with a comparison, in order, of “Japanese pearls” (*Nihon no shinju* 日本の真珠) and “Chinese pearls” (*Shina no shinju* 支那の真珠), see Nishikawa Tōkichi, *Shinju* (Tokyo: Nishikawa Shinjūrō, 1914).

⁵⁸ Importantly, this was not culture as *bunka* 文化, the term that would most likely come to mind today if we were to invoke particularistic twentieth century notions of “Japanese culture.” For a careful examination of changing ideas of *bunka* in relation to Japan, see Tessa Morris-Suzuki, “The Invention and Reinvention of ‘Japanese Culture,’” *The Journal of Asian Studies* v. 54 n. 3 (August 1995), pp. 759-780. *Bunka* was also a term which, in its post-World War guise as the “culture life” or *bunka seikatsu*, came to denote a Japanese white-collar urban “desire for a life unencumbered by either local traditions or the established distinctions of native and foreign [that] was met by a plethora of new publications and commodities purveyed under the name of *bunka*.” Jordan Sand, *House and Home in Modern Japan, Architecture, Domestic Space, and Bourgeois Culture* (Harvard University Asia Center, 2005), p. 203. This is not to say that visions of the “culture life” were removed from Mikimoto’s company; to the contrary, images of what Jordan Sand has termed “cosmopolitan modernity” were key facets of Mikimoto’s advertising appeals to women in interwar Japan.

⁵⁹ K. Mikimoto, *Japanese Culture Pearls: A Successful Case of Science Applied in Aid of Nature* (Tokyo: Mikimoto Pearl Company, 1907).

But as Chapter 3 attests, the problem of naming the products of pearl cultivation stirred up protracted conflict outside the Japanese empire from the 1920s onward. In London and Paris, the arrival of Mikimoto and his competitors' second-generation round pearls—formed from a spherical nucleus that had been surgically implanted inside or alongside the fleshy recesses of a living shellfish—prompted re-articulations of commercial, legal, and scientific meanings of human intervention in the lives of non-human creatures. Outside the Japanese empire, pearls that were both “Japanese” and “cultured” conflated place, race, and process in ways that made their commercial status extremely problematic. Were the products of cultivation the same as “oriental” pearls, albeit with possibly differing internal structures? Or were they instead something completely different, in spite of displaying practically indistinguishable exteriors?

Christopher Bush reminds us of a late nineteenth century moment when “japanning” was synonymous with the coats of black lacquer that covered many objects imported from Japan into the West.⁶⁰ Japanning aligned with metaphors employed by critics both inside and outside a modernizing Meiji Japan. Did modernity entail a total societal transformation? Or was it instead a veneer that covered an unchangeably Japanese interior? Techniques of cultivating spherical pearls made the identity of a pearl into an inverted problem of distinction.

Dealers who organized against “Japanese cultured” pearls saw the basis of evaluation turned inside out when their examination of surfaces revealed no differences

⁶⁰ Christopher Bush, “The Ethnicity of Things in America’s Lacquered Age,” *Representations* v. 99 n. 1 (Summer 2007), pp. 90-92.

between pearls. Existing practices of assigning a pearl's value according to its external appearance fell into disarray. From the perspective of pearl purveyors in Paris and London a much more insidious problem moved to the fore: maintaining a newfound desire for market purity between "orientals" and "*les japonaises*" when hard-won visual expertise did not yield trustworthy answers.

We need to consider pearls as material objects in order to understand how and why pearl cultivation provoked a crisis of connoisseurship and how it ushered in a reliance on machine-mediated appraisal in Europe.⁶¹ Changing techniques of cultivation in Japan changed the way people elsewhere gauged the price of pearls: not at the surface, which was misleading if you looked only at exteriors, but rather at the center, which was inaccessible to the naked eye. Anti-cultivation pearl dealers tried to keep Japanese, cultured pearls from passing as oriental, natural ones. They sponsored the implementation of a pearl counterpart to regulations on human movement: travel papers, x-ray examinations, and prescribed detainment periods to ensure that pearl identities were in order.⁶² These countermeasures comprised an attempt to police what appeared to be a Japanese threat to a trade that moved pearls from the Persian Gulf (and places like Australia, French colonies in Pacific Oceania and Madagascar, and Venezuela) to Bombay, to Paris and London, and increasingly to New York. Pearl farms in the Japanese

⁶¹ For a careful consideration of the historical possibilities of material culture studies, see Leora Auslander, "Beyond Words," *American Historical Review* (October 2005), pp. 1015-1045.

⁶² See John C. Torpey, *The Invention of the Passport: Surveillance, Citizenship, and the State* (Cambridge University Press, 2000); and, more specifically to the question of what was happening in interwar France, Clifford D. Rosenberg, *Policing Paris: The Origins of Immigration Control Between the Wars* (Ithaca: Cornell University Press, 2006).

empire begat pearl testing laboratories—staffed by a new class of trained pearl testers—outside the empire.

Names, in turn, reflected broader grapplings about relationships between form and value. In the modern English language, as in several others, the pairing of nature and culture has come to denote an anthropocentric dualism. Culture is human; nature is anything but. The is-or-isn't simplicity of the nature-vs.-culture dualism headlines a bevy of nature-based dichotomies that have held sway in different times and places, such as nature and technology, nature and art, nature and nurture, or nature and improvement.⁶³ Its power as a classificatory rubric lies at the heart of what some have begun to call the anthropocene, a present-day epoch defined by human-induced changes to the environment—and, with the political implications it entails, to the Earth's climate—that outweigh those due to natural processes.⁶⁴

Nature-vs.-culture made an appearance in the first international nomenclature guide for pearls and precious stones, published in 1936 by a Europe-wide association of dealers known under its French acronym B.I.B.O.A.:

⁶³ See, for example, Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution* (San Francisco, Harper and Row, 1980); William R. Newman, *Promethean Ambitions: Alchemy and the Quest to Perfect Nature* (Chicago: University of Chicago Press, 2004); Richard Drayton, *Nature's Government: Science, Imperial Britain, and the 'Improvement' of the World* (New Haven: Yale, 2000). For a formulation of a modern desire to compartmentalize nature even amid continued interlinkages with the natural world, see the introduction to Ian Miller, *The Nature of the Beasts: Empire and Exhibition at the Tokyo Imperial Zoo* (Berkeley: University of California Press, 2013).

⁶⁴ Paul J. Crutzen and Eugene F. Stoermer, "The 'Anthropocene,'" *IGBP Newsletter* v. 41 (2000), pp. 17–18.

Pearl

This designation must only be used for the natural product of a mollusc unaided in any way by human agency.

Cultured Pearl

*Pearls which have been produced with the assistance of human intervention must bear this designation.*⁶⁵

The enforcement of a separate category for “cultured” pearls was inextricable from attempts to make objects that at first came only from the coasts of the Japanese empire incommensurable with “oriental” counterparts. The “culture” of a cultured pearl and the “nature” of a natural one, in short, were twinned products of heated debates over the limits of human agency in Europe’s major twentieth century pearl entrepôts of Paris and London.⁶⁶ The nature-vs.-culture dualism was itself a man-made simplification, not a natural state of being.

⁶⁵ B.I.B.O.A., *International Nomenclature of Admissible Trade Names* (The Hague: B.I.B.O.A., 1936). German-language pearl nomenclature reflected both a notion of cultivation akin to the Japanese *yōshoku* (“Zucht-Perle,” in B.I.B.O.A.’s quadrilingual English-French-German-Italian schematization, as opposed to the “true pearl” or “echte Perle”) as well as culture in the form of a “Kulturperle” opposed to a “Perle” or “Naturperle.” See Hermann Michel, *Perlen und Kulturperlen: Entstehung, Bau, Fischerei, Handel und Untersuchung* (Leipzig: Diebner, 1940). An *echte Perle* was nevertheless divided from a *Zucht-Perle* by evidence of human intervention (in B.I.B.O.A.’s formulation, “ohne jedes Zutun von Menschenhand”).

⁶⁶ Debates over the verifiability of the qualities of consumer items (with the notable touchstones of wine and dairy products) and their possible substitutes were ongoing in early twentieth century Europe and the United States. See Alessandro Stanziani, ed., *La qualité des produits en France: XVIIIe-XXe siècles* (Paris: Belin, 2003); Kendra Smith-Howard, *Pure and Modern Milk: An Environmental History Since 1900*, New York: Oxford University Press, 2014). There are parallels between the racial valences of this controversy and a slightly earlier one over whether Japanese silkworms, creatures bred widely across the archipelago and later selected for Meiji-government sponsored breeding experiments—could be considered distinct from “wild” silkworms gathered elsewhere in the world for the purposes of early twentieth century Mendelian genetic research. Lisa Onaga, “Toyama Kametaro and Vernon Kellogg: Silkworm Inheritance Experiments in Japan, Siam, and the United States, 1900-1912,” *Journal of the History of Biology* v. 43 n. 2 (2010), pp. 215 - 264.

Mikimoto, however, did not see himself at odds with anti-cultivation European dealers. He and his employees tried to temper the nature-culture dualism that emerged to classify the products of pearl cultivation by telling a story of cultivation methods that were exclusive to Japanese waters, but which yielded objects that looked no different from other “oriental” or “natural” pearls. Chapter 4 focuses on Mie Prefecture’s coastlines to illustrate how dramatic changes to the social bases of markets for “natural” and “cultured” pearls alike unfolded after the global repercussions of post-1929 financial crisis and post-1931 Japanese aggression on the Asian mainland. A standard view in the historiography of the Persian Gulf region is that Japanese pearl cultivation decimated the region’s hitherto dominant pearl economy at a 1930s moment when its oil economy was taking shape. The global regime of exchange value supporting “oriental” pearls indeed collapsed, but this was not solely due to the problems posed by “cultured” pearls in places where “natural” ones were bought and sold. The idea that non-cultivated pearls would continue to rise in price burst after the 1929 Wall Street crash, but views of cultured pearls as objects of middle-class consumption appeared in earnest only after the prices of both kinds of pearls began to fall after 1929. In Mie/Shima, the lure of international commerce was a double-edged sword. As Karen Wigen reminds us in her study of the Shimoina valley’s transformation into a region dependent on the cultivation of silkworms and the reeling of silk, export trade was fickle trade, no more so than in the decades after World War I.⁶⁷ The new development in this case was that cheaper cultured pearls (made

⁶⁷ Kären Wigen, *The Making of a Japanese Periphery, 1750-1920* (Berkeley: University of California Press, 1995).

cheaper still by a Japanese yen detached from the gold standard after 1931) brought an influx of cultivators to coastlines in Mie/Shima and elsewhere. The 1930s spread of pearl cultivation along Japanese coastlines occurred alongside, but did not fully determine, a parallel contraction of pearl fisheries in the Persian Gulf. Mikimoto presented pearl cultivation as unique to the Japanese empire, and billed himself as the sole representative of pearl cultivation overseas. But with other pearl cultivators setting up farms, he avoided lumping his products together with other “Japanese cultured” pearls. What he hoped to do was to sell them under his brand, as “Mikimoto” pearls. Mass pearl cultivation was a contradictory response to a rising number of cultivators in 1930s Japan: Mikimoto tried to control competing Japanese pearl production through the use of patent-sharing agreements, even as his farms processed more shellfish than ever before.

Making use of recently uncovered archival materials, including business letters from the Mikimoto company archives, Chapter 5 attends to the commercial and diplomatic activities of the Mikimoto salesmen who sold pearls inside and outside the Japanese empire.⁶⁸ Despite the grandiose claims of killing 500 million pearl oysters Mikimoto made at his 1936 *kuyō* ceremony, he drastically scaled back his cultivation activities amid local challenges to his fisheries rights and the expiration of his patent rights. Even so, what Mikimoto’s promotional materials called the “Romance of Pearl Culture”—viewed in person at the company’s Pearl Island theme park or disseminated through film, text, and still image—constituted the public face of Japanese invention in

⁶⁸ By in some ways reversing the terms of analysis, it complements studies of early American sales activities, above all the campaigns run by the Singer Sewing Machine Company, in the Japanese empire. Andrew Gordon, *Fabricating Consumers: The Sewing Machine in Modern Japan* (Berkeley: University of California Press, 2012).

early twentieth century Europe and, in the wake of disputes over the distinction of “cultured” and “natural” pearls, increasingly in the United States. Mikimoto’s dual goals of legitimating his own priority as an inventor of pearl cultivation methods and establishing the equality of cultured pearls with natural ones aligned with broader Japanese state concerns about the tenuous overseas place of Japanese people and products after the First World War. But European battles over pearl nomenclature also moved to a new and different field in a 1920s America where, even though Japanese migrants and many Japanese things faced significant legal barriers to entry, natural and cultured pearls received equal treatment under federal customs law. In New York City, the Western world’s largest market for pearls and precious stones, the affordability of cultured pearl necklaces became part of gendered depression-era appeals by Mikimoto’s salesmen—and newly arrived American cultured pearl dealers—to entice American women to purchase objects of adornment rather than objects of investment. The chapter ends with a preliminary sketch of wartime and postwar persistence of American desire for cultured pearls—and for the persistence of Mikimoto’s company amid a wide range of newly invigorated pearl cultivators in post-1945 Japan and, from the mid-1950s onward, in Australia and elsewhere in the Pacific.

Notions of non-human nature, anthropocentric culture, and distinctions between the two reshaped coastlines and pearl trades throughout the late nineteenth and early twentieth century world. Precisely because there were multiple and often competing meanings of cultivation, relationships between humans and mollusks—as well as the products that

resulted from them—became flashpoints of conflict. In the formal terms of imperial Japanese industrial property and fisheries law, pearl oysters became ownable creatures that were susceptible to tinkering and capable of producing pearls on demand. At the same time, however, supporters of cultivation emphasized the agency of shellfish in making pearls: the labor of cultivation was not solely human, they claimed, but molluscan. Even as Mikimoto promoted his company's state-authorized efforts to aid nature by assisting in the formation of pearls in living creatures, European pearl dealers tried to shore up trust between buyers and sellers by shedding light on what they saw as the innate differences between a natural and a cultured object. One simplification turned a racialized overlapping of process and Japanese provenance into a label of "cultured" that was based on a seemingly universal criterion of human artifice. Another simplification made it possible to claim pearl oysters, the waters in which they lived, and their productive capabilities under a single man's name.

Chapter One

Pearl Kingship:

Shellfish Protection and the Bayscape of Saltwater Cultivation

In 1912 Takahama Kyoshi, one of the best-known *haiku* poets of his day, was on an hour-long shipboard journey from the northern edge of Mie Prefecture's Ago Bay to an island known as Tatokujima when something caught his eye.

At that moment I noticed a number of four-sided stakes. Some were by nearby rocks, others by farther-off promontories. As soon as we moved closer to one of the stakes I was able to make out eight characters that had been written along it: 'The Mikimoto Pearl Culture Farm' (*Mikimoto shinju yōshokujō* 御木本真珠養殖場). After we passed one of the promontories, the bay gradually widened. I could make out another, similar stake standing by the next promontory, far away in the distance. In other words, more than one million *tsubo* [around one thousand acres] of Ago Bay waters, a figure listed among the numbers Mikimoto had just showed me, opened up before my eyes.⁶⁹

The boundary stakes that had popped up along the waters of Ago Bay were one manifestation of changes that were shaping Japan's early twentieth century coastlines. Unprecedented opportunities appeared for marine entrepreneurs across the Japanese empire to make overlapping claims over living creatures, their productive capabilities, and the watery places where they lived. In Ago those rights accrued at first to one man, Mikimoto Kōkichi.

⁶⁹ Takahama Kyoshi, "Toba-kō ni okeru Mikimoto shinju yōshokujō o miru," *Jitsugyō no Nihon* v. 15 no. 7 (1 April 1912), p. 56.

Mikimoto's social and economic position as a pearl cultivator in Ago Bay was tied to a wider late nineteenth century vision of export-led development and saltwater entrepreneurship. Bureaucrats and marine entrepreneurs alike shared desires for a new kind of fisheries governance outside the orbit of village commons and treaty port merchants. Many of them turned their attention to the reproduction and development of the creatures that sustained an enormous—and, in many of their eyes, endangered—trade in China-bound marine products. They talked about fisheries in two registers, applauding the potential of nearshore fisheries in metaphors of agricultural capital investment while decrying “reckless” practices of village catching and gathering. Both concerns became focal points of debate over the legal basis of Japan's fisheries.

This chapter charts Mikimoto's changing relationships with the humans, pearl oysters, and waters of Ago Bay from the late 1870s to the early 1900s, for it was in Ago where an early twentieth century bayscape of pearl cultivation emerged from a late nineteenth century sense of fisheries crisis. Pearl oysters in Ago, and elsewhere in Japan, had long existed as creatures that were removed and killed upon being gathered. Predominantly female divers and predominantly male shellfish tongers valued pearl oysters as much or more for their meat as for their shell and occasional pearls. Mikimoto and others came to see pearl oysters as living inputs in years-long, patented processes for inducing the formation of salable objects of adornment. He valued shellfish not for whether they contained a pearl at the time they were initially gathered, but as creatures that could be made to produce pearls over a period of several years in the water. At the turn of the twentieth century, Mikimoto owned millions of living pearl oysters and

bought thousands more each year from nearby village fishing associations. A gendered division of labor emerged on land and sea. Hundreds of wage-earning female divers worked with populations of what Mikimoto and others called “mother oysters” (*bogai*), clustering the mollusks on the seafloor and moving them to deeper waters as they grew. Other employees—many of them members of Mikimoto’s extended family—surgically manipulated pearl oysters to produce hemispherical objects that Mikimoto and his growing corps of salesmen would sell under the name “culture pearl,” or *yōshoku shinju*. It was a name that, in Japanese, reflected a vision of marine cultivation as *yōshoku*—the “culture” of the Mikimoto Pearl Culture Farm—a term that came to be buttressed by a legal conception of exclusively-managed coastal waters.

Consumers in the United States and Europe began to see and read about Mikimoto’s “culture pearls” at the turn of the twentieth century. Around that time, some of Ago Bay’s village fishers also began to note dramatic changes in the waters of the bay. “Culture pearls” existed not only as objects of ornament, but as objects that formed inside pearl oysters with the legal status of livestock, in waters that could, in turn, be staked off under the name of the individual cultivator who held the rights to that space. In the process of “culturing” pearls, Mikimoto—and, within a short time, other villagers living near him—shaped Ago Bay to suit the needs of living shellfish. Using national fishery reforms along with local pearl oysters, dive labor, and coastal waters, Mikimoto was able to transform methods of shellfish raising into a burgeoning export business oriented toward Western tastes in ornament. His business integrated villages deep within the bay into an economy based on demarcated ocean space, wage labor, and “mother oysters.” At

the same time, operating upon and watching over ever larger numbers of shellfish brought concerns more commonly associated with terrestrial agriculture—fences, crop diseases, and livestock rustling—into the waters of Ago Bay. Mikimoto's expanding pearl culture farm, in other words, reorganized coastal waters according to a legal logic of monopoly ownership and an environmental logic of monoculture.

Garrett Hardin's 1968 essay "The Tragedy of the Commons" famously framed resource exploitation in the absence of property claims as a one-way ticket to resource exhaustion.⁷⁰ Using the California sardine fishery as his case, Arthur McEvoy subsequently critiqued the idea of a "tragedy" by arguing that overharvesting was not a universal condition, but rather a historical process shaped by fluctuating fish populations and a legal system that undergirded a market economy while abstaining from hard-nosed regulatory measures. McEvoy presented the trajectory by which everyone came to compete for fish without being able to exclude competitors as "the fisherman's problem."⁷¹ Meiji Japan was one place where something akin to Hardin's proposed solution to tragedy emerged: the institution, and subsequent application, of a national system of coastal fishing rights. If the fisherman's problem was a boom-and-bust scramble for marketable but unregulated fish, Mikimoto Kōkichi's problem—"the aquatic cultivator's problem" writ large—was a problem of maintaining control over extremely fluid spaces. In Ago Bay, this problem manifested itself as a preoccupation with the

⁷⁰ Garrett Hardin, "The Tragedy of the Commons," *Science* v. 162 n. 3859 (1968), pp. 1243-1248.

⁷¹ Arthur McEvoy, *The Fisherman's Problem: Ecology and Law in the California Fisheries, 1850-1980* (Cambridge: Cambridge University Press, 1986).

continued exclusion of unwanted human and non-human intrusions at the frontiers of saltwater cultivation.

The Dealer from Shima

Mikimoto Kōkichi and others living near him in the late nineteenth century almost invariably referred to themselves as men of Shima Province, not men of Mie Prefecture. They took pride in their connections to a past defined by pre-Tokugawa imperial provincial boundaries that remained culturally resonant.⁷² Mie, like many other prefectures throughout Japan, had been subject to several relatively drastic re-zonings in the years following the dismantling of the domains and the implementation of a centrally-directed prefectural system in the name of the Meiji emperor. When its borders stabilized in 1876, Mie Prefecture was a congeries of contiguous but varying regions. In the Meiji period, all forged deep commercial ties to financial metropolises in Nagoya and Osaka even as they diverged within the prefecture. Much of the prefecture's area consisted of the province of Ise, an expanse with borders along Ise Bay that stretched from the commercial center of Yokkaichi, south to the former castle town (and, after some debate, prefectural capital) of Tsu, and on down to Ise shrine, the empire's most important shrine and site of pilgrimage for millions of travelers. To the west was a portion of Iga province; along the southwest coast part of Kii province. At the southernmost edge of Ise Bay was Shima. Shima's castle town of Toba had long been a trading hub in a

⁷² For more on the Meiji resonance of imperial provincial identities, see Kären Wigen, *A Malleable Map: Geographies of Restoration in Central Japan, 1600-1912* (Berkeley: University of California Press, 2010).

regional coastal economy that stretched from Ise Bay and west to the Pacific waters off Kii. It was the former headquarters of Toba domain and had been, for a few brief months in 1871, the capital of Toba prefecture.

As one American newspaper later put it, Shima, the smallest of Japan's former imperial provinces, was "the Rhode Island of Japan."⁷³ Nevertheless, Toba was at the center of Mikimoto Kōkichi's world. Mikimoto's family lived lives that revolved around buying and selling. His father had been involved in the grain trade and flour milling since before the Meiji Restoration; the family ran a shop selling flour-based *udon* noodles on the side.⁷⁴ Other edible and drinkable commodities—mainly fruits, vegetables, and tea—passed through the young Mikimoto's hands as well.⁷⁵ In the late 1870s, however, Mikimoto began to make himself a part of the marine products trade.

On 26 March 1878, a nineteen-year-old Mikimoto headed out on his first extended eastern journey. Ten days later he and his companion, an older Toba merchant named Morioka Riemon, arrived in Tokyo.⁷⁶ From there they made their way south to the treaty port of Yokohama. Mikimoto got his first glimpse of the commercial sinews that moved marine products from Japanese coastlines to Chinese markets. Commodities derived from marine plants and animals had formed a pillar of trade from early modern Japan to Qing

⁷³ Rene Bache, "Artificial Pearls Appear on the Market," *The Salt Lake Tribune* (23 May 1909).

⁷⁴ Mikimoto's father designed a milling device in order to better grind the family's stock in trade. See Ototake Iwazō, *Denki Mikimoto Kōkichi* (Tokyo: Kōdansha, 1950).

⁷⁵ Ototake Iwazō, *Denki Mikimoto Kōkichi*.

⁷⁶ Ototake Iwazō, *Denki Mikimoto Kōkichi*, pp. 16-19.

China. *Shōgun*, *daimyō*, and entrepreneurial go-between alike had competed to acquire silver (and sometimes other items) from Chinese and European merchants in exchange for dried, trimmed, and sorted marine products. Above all, they dealt in edible *konbu* kelp, abalone, and sea cucumbers. Early modern trading documents often grouped these marine products under the generic heading of “bundled goods” (*tawaramono*), which hinted at the tied and dried stacks of flesh and cellulose that arrived in ports like Nagasaki for shipment to places like Ningbo or Shanghai. Domain governments compelled fishers and divers in coastal villages to meet marine product quotas while simultaneously patrolling bays. The trade in bundled goods was lucrative, so much so that domains like Satsuma attempted, with some success, to trade outside the purview of shogunal officials.⁷⁷

Marine products moved from Japanese shores to Chinese ports in huge numbers throughout the nineteenth century.⁷⁸ However, Japan’s mid-1850s international treaty structure and the post-1868 political transition from variegated domains to a centralizing imperial state put new commercial relationships between living creatures and the bundled goods they yielded. Under the provisions of the commercial treaties, foreign merchants were able to live in designated treaty ports but unable to travel freely outside them. As a result, foreign wholesalers relied on local coastal buyers to provision them with exportable goods. Enterprising merchants along far-flung coasts throughout Meiji

⁷⁷ Robert Hellyer, *Defining Engagement: Japan in Global Contexts, 1640-1868* (Cambridge: Harvard University Press, 2009).

⁷⁸ Ogawa Kuniharu, *Edo Bakufu yushutsu kaisanbutsu no kenkyū: tawaramono no seisan to shūka kikō* (Yoshikawa kōbunkan, 1973).

Japan quickly learned that urban Japanese wholesalers and foreign trading houses in treaty ports sought to buy processed marine creatures and products derived from them. In Yokohama, Mikimoto saw the extent to which wholesalers craved boiled and dried sea cucumber (*iriko* 海参) and dried abalone (*kanpō* 乾鮑)—precisely the kinds of marine products for which Shima’s coasts had long been known.

In the months following his return to Toba in May 1878, Mikimoto tried his hand at purchasing and selling almost everything that came out of seas in Shima and farther afield. Bearing baled stacks of dried sea cucumber, abalone, and *konbu*, Mikimoto made trips to Kobe and Yokohama to sell his wares. The young dealer found, too, that Chinese and European merchants were on the lookout for mother-of-pearl shell and, when available, pearls. For Mikimoto, pearls formed a small but lucrative sideline, one that catered primarily to Chinese demand for *materia medica*:

In earlier times, the Chinese used pearls for medicinal purposes. The good ones would be used for ornament. The bad ones would be ground into powder in China. It would prolong your life if you drank it. Color would come to your cheeks. Even if you smoked opium, it was said that if you added a little pearl, the opium’s harmful effects would dissipate. I don’t believe this myself, but from what I hear drinking a little powered pearl will cure vision loss (*kokushōgan* 黒障眼).⁷⁹

Though Mikimoto proclaimed not to trust every cure ascribed to pearls, he recognized that they were part of a larger intra-Asian trade in medicinal plants and animals. As with his ventures in dried sea cumpers or abalone, Mikimoto first dealt with pearl oysters after they had been gathered and disarticulated into shell, meat, and the occasional pearl. When Mikimoto later reflected on his early days in the business of

⁷⁹ Mikimoto Kōkichi, “Shinju monogatari,” *Kokoro no hana* v. 9 no. 4 (April 1905), p. 54.

buying products derived from Shima's *akoyagai*, he remembered heady times: "shell could be exported to Hamburg for buttons," while "meat could also be dried and shipped to China." Up until the late 1870s, he said, "gathering pearl oysters was a very good business."⁸⁰

Two Kinds of Fisheries

In 1880, just as Mikimoto began to get into the marine products trade, a Mie Prefecture gazeteer noted of seven villages along Ago Bay that "pearls have been rare in recent years."⁸¹ Reports of marine creature declines were by no means confined to Shima and its pearl oysters, as Rear Admiral Yanagi Narayoshi could attest. "These days, there is no place that has not reached a state of uncontrolled and excessive fishing," Yanagi lamented in an 1884 speech to the organization he had headed for over a year, the *Dai Nihon Suisankai*.⁸²

Members of the *Dai Nihon Suisankai* chose to render their group's name in English as the Fisheries Society of Japan. As zoologist Mitsukuri Kakichi wrote in 1892, "The word *suisan* existed before, but it is not long since it came into widespread use. It began to appear on people's lips around ten or fifteen years ago. Ever since the Fisheries Society (*Suisankai*) and the Ministry of Agriculture and Commerce's Fisheries Bureau

⁸⁰ Mikimoto, "Shinju monogatari," April 1905, p. 54.

⁸¹ *Mie kannai hakubutsushi* v. 10 (1881), plate 14.

⁸² Yanagi Narayoshi, "Suisan no hanshoku o hakaru ni hitotsu no konnan ari," *Dai Nihon suisankai hōkoku* n. 32 (Oct. 1884), p. 12.

(*Suisankyoku*) started up, the word *suisan* has naturally come to be spoken.”⁸³ Yanagi and his fellow Fisheries Society members thus spoke on behalf of the fishery as *suisan* 水産, a catch-all that could be rendered grapheme-for-grapheme as “aquatic production.” It implied the application of scientific techniques in order to harness the productive powers of watery, and especially marine, spaces. In a country bordered “on all four sides by the ocean” (*shimenkai*), as the Fisheries Society’s supporters repeated over and over, *suisan* encapsulated a late-nineteenth century vision of an industrial future propelled by knowledge of the fruits of the sea.⁸⁴

In contrast, the Fisheries Society looked more warily at *gyogyō* 漁業, another choice for what English-language speakers might have called a “fishery” in the late-nineteenth century. Fisheries boosters began to see *gyogyō*, the “business of catching” water-dwelling plants and animals, as activities that had spiraled out of control following the Meiji Restoration. Catching and gathering, catchers and gatherers, and fishing villages (*gyoson* 漁村) became activities, roles, and places in need of strict regulation through mechanisms like fishing rights (*gyogyōken* 漁業権) and fishing associations (*gyogyō kumiai* 漁業組合) or through incentives to push catching outside the legal limits of “Japanese” waters.⁸⁵

⁸³ Mitsukuri Kakichi, “Suisan chōsa ni tsuite,” *Dōbutsugaku zasshi* v. 4 n. 44 (15 June 1892), p. 232.

⁸⁴ An early reference to *shimenkai* came at the Fisheries Society’s formation. See *Yomiuri shinbun*, 9 Feb. 1882.

⁸⁵ Some of the consequences of Japanese fisheries expansion near Chinese coastlines can be seen in Micah Muscolino, *Fishing Wars and Environmental Change in Late Imperial and Modern China* (Honolulu: University of Hawai’i Press, 2005).

Evaluations of opportunity and evaluations of decline shared top billing at the Fisheries Society's meetings. If association members saw strong foreign demand for products derived from marine creatures like pearl oysters, they also saw a crisis of overfishing along Japan's coastlines. Yanagi and others in Japan's fisheries booster community located the cause of coastal depredation in the disappearance of pre-Meiji regulations and the spread of new gathering methods (in particular air-pumped diving apparatus) that allowed access to marine creatures wherever they lived.

To be sure, *gyogyō* and *suisan* were by no means direct opposites.⁸⁶ Rather, as Mitsukuri suggested, the fishery as *suisan* evoked a sense of novelty and legitimacy in Meiji Japan. Members of the Fisheries Society agreed that coastal waters required drastic reforms, a prong of which came to be encapsulated in the two keywords of Meiji-era conservation: propagation (*hanshoku*) and protection (*hogo*). In the face of apparently declining numbers of aquatic creatures, propagation was a defining goal of nineteenth century fisheries officials around the world. Historian Takahashi Yoshitaka has gone so far as to call the late nineteenth century "the age of resource propagation."⁸⁷ Concerns over coastal and freshwater resource depletion united university-trained fisheries officials in Europe, the United States, and Japan. Mid-century state sponsorship of research into fish and oyster breeding in Second Empire France found eager audiences well beyond the French hexagon. Experimental fisheries stations popped up along the coasts of Europe

⁸⁶ *Gyogyō*, after all, was a part of mechanized long-distance trawlers, offshore net-fishing, and nearshore diving alike.

⁸⁷ Takahashi Yoshitaka, "*Shigen hanshoku no jidai*" to *Nihon no gyogyō* (Tokyo: Yamakawa Shuppansha, 2007).

and the eastern United States. From the 1870s, the United States Bureau of Fisheries spearheaded efforts to artificially fertilize freshwater fish varieties and deliver the hatchlings to lakes and rivers.⁸⁸ Japanese fisheries officials in the Ministry of Agriculture and Commerce and university zoologists followed research produced by their colleagues and former mentors abroad, all the while producing survey studies of their own (many of which found publication in English).⁸⁹

In Meiji Japan, as elsewhere in the late nineteenth century, a legal and practical ethos of propagation underwrote the delineation of exclusive areas reserved, at least ostensibly, for the replenishment of marine creatures rather than for their harvest alone. Fisheries officials emphasized the importance of their mediating roles in understanding the reproductive habits of marine organisms through survey methods and microscopic examinations. They hoped to avoid “reckless harvesting” (*rankaku*) by determining spawning periods for each variety and restricting collecting during that egg-laying window. The ideal of propagation also included measures intended to secure the protection of living marine creatures from human gatherers. By the 1880s, reports of overfishing along coastlines throughout the country had prompted central and prefectural government fisheries officials to restrict the gathering of certain marine creatures. Aided on the ground by policemen on their rural beats, fisheries officials attempted to root out excessive and reckless gathering. One key area of concern was the

⁸⁸ See Darin Kinsey, “Seeding the Water as Earth: The Epicenter and Peripheries of a Western Aquacultural Revolution,” *Environmental History* v. 11 n. 3 (July 2006), pp. 527-566.

⁸⁹ Takahashi Yoshitaka, “*Shigen hanshoku no jidai*” to *Nihon no gyogyō* (Tokyo: Yamakawa Shuppansha, 2007).

lucrative export marine products trade headlined by abalone, sea cucumbers, *konbu*, and, increasingly, pearl oysters.⁹⁰

Members of the Fisheries Society of Japan began to discuss the possibilities of engaging in Western markets for pearls and mother of pearl soon after the society's founding. "Increasing the number of marine creatures is now an urgent matter in this country," the wide-ranging zoologist Sasaki Chūjirō argued to the Society after an earlier 1883 survey of pearl oysters along the coastlines along the island of Shikoku. "In order to protect pearl oysters and get them to reproduce, the two necessities are to study their spawning seasons and the methods for raising them."⁹¹ Zoologists pushed for applied research into ways to propagate more of them in exclusive breeding spaces. Whether or not one could gather a pearl oyster became linked to biological understandings of reproduction and development. Principles of "protection and propagation" underlay arguments for the drawing of new spaces in which fishing restrictions could protect spawning adult and growing juvenile creatures, as well as others in which methods might be undertaken in the name of intentionally increasing those creatures' populations. Key to these efforts would be local collaboration. As Sasaki Chūjirō put it in 1884, "were spirited men to put restrictions in place and attempt to propagate pearl oysters, and if the bad habit of throwing empty pearl oyster shells away could be eliminated, pearl oysters would become one of this country's biggest exports."⁹²

⁹⁰ Takahashi, "*Shigen hanshoku no jidai*."

⁹¹ Sasaki Chūjirō. "Shinjugai no setsu." *Dai Nihon suisankai hōkoku*, no. 24 (March. 1884), pp. 26-27.

⁹² Sasaki, "Shinjugai no setsu," pp. 26-27.

Local Governance and Fisheries Improvement

In Shima, concerns about marine product quality dominated local politics in the late nineteenth century. Mikimoto jumped into this fray. By 1880 he had become the youngest member of Toba's town council. Soon thereafter he served as a leader of a local commercial group, the Shima Marine Products Improvement Association (*Shima no kuni kaisan kairyō kumiai*). Much of his energies went toward creating and enforcing sea cucumber processing standards among villages in Ago Bay and elsewhere.⁹³

Marine products were the lifeblood of Shima's late nineteenth century economy and, increasingly, the source of Mikimoto's own livelihood. Yet whenever marine product buyers arrived in Yokohama or Kobe with bundles of dried abalone, kelp, and sea cucumber, they quickly found that wholesalers drove the terms of quality control. If a wholesaler's appraisers judged a shipment of abalone to be of poor quality, the wholesaler would offer a much lower price—that is, if he didn't refuse to buy it outright.⁹⁴

In the mid-1880s Mikimoto Kōkichi dealt in one of Pacific Asia's most widely traveled marine products, dried sea cucumber.⁹⁵ Through the Marine Products

⁹³ Ototake Iwazō, *Denki Mikimoto Kōkichi*, pp. 28, 35.

⁹⁴ Trading relationships between Shima's dealers in dried sea cucumber and treaty port-based Chinese merchants received coverage in the Fisheries Bureau's two-volume treatise on the marine products trade. See *Suisan bōeki yōran kō* (Nōshōmushō suisankyoku, 1903), pp. 103-104, 148-153.

⁹⁵ For a sea cucumber's-eye-view of the global trade in marine products, see Tsurumi Yoshiyuki, *Namako no me* (Chikuma shobō, 1993).

Improvement Association Mikimoto joined attempts to reform the methods used by coastal villages to boil and dry sea cucumbers that coastal buyers (like himself) took to the treaty ports for sale. Shima's merchants knew that a reputations of quality could be conveyed through claims of regional provenance. They hoped to make Shima itself into a brand that might translate into higher prices from wholesalers. At the same time, Mikimoto and others made choices about how to sell their own marine products. Coastal buyers like Mikimoto preferred to send their best sea cucumber to Chinese merchants residing in Yokohama, even though it required a longer journey than to Kobe.⁹⁶

Mikimoto came to the attention of the Fisheries Society of Japan as an improver of Shima village sea cucumber processing methods. Not long thereafter he began to move his business interests into the waters of Ago Bay. Mikimoto brought samples of Shima's "improved" dried sea cucumber and some of its pearls to a Fisheries Society of Japan exposition held in June 1888. There he met with the head of the association, Rear Admiral Yanagi Narayoshi. Yanagi had been a samurai official from the former Tsu domain, the territory of which had become part of Mie prefecture along with that of Toba domain in Shima province.⁹⁷ Afterwards Mikimoto invited Yanagi back to the Shima coasts he had once surveyed. Mikimoto took advantage of the retired admiral's presence to have Yanagi help broker a deal with the village of Shinmeinoura for access to a few small plots of

⁹⁶ "Mie ken Shima no kuni iriko eigyōsha kumiai kiyaku," *Dai Nihon suisankai hōkoku* n. 75 (1888), pp. 60-61.

⁹⁷ In the early 1860s Yanagi had surveyed coastlines in Ise and Shima; he would continue to chart Meiji Japan's waters as part of the reorganized imperial Japanese navy after 1868. See Ōbayashi Hideo, *Mikimoto Kōkichi* (Yoshikawa kōbunkan, 1988), pp. 40-41.

seafloor to which he could move pearl oysters and raise them.⁹⁸ Toward the end of the decade, other Shima merchants, most notably a young man called Ogawa Shōtarō, had begun to move their business interests into the water. Small-scale propagation sites, into which pearl oysters could be moved and guarded, appeared in Ago Bay. Mikimoto, for his part, took an interest in his sometime business partner Ogawa's plans.⁹⁹ The venture was, along with Ogawa, short-lived: Ogawa's passed away in 1889 at the age of twenty-four, leaving Mikimoto as Ago Bay's most prominent pearl oyster raiser.

Shellfish raising put Mikimoto in the middle of Japan's late nineteenth century coastal fisheries politics. Faced with technological changes and increasing interest in the gathering of valuable shellfish, prefectural governments across Japan implemented a number of additional restrictions on the gathering of marine creatures. Pearl oysters were no exception. In December 1885, Nagasaki prefecture banned the practice of leasing the pearl-oyster-rich beds that stretched from Ōmura south to Sasebo bays, in effect shutting down the local gathering industry. The regulations covered forty-nine areas and would remain in effect for eight years.¹⁰⁰ In 1889 the Ministry of Agriculture and Commerce appealed for even more widespread restrictions in the empire's known pearl oyster habitats—ten prefectures in all—in order to stem “the bad habit of reckless shellfish

⁹⁸ Ototake Iwazō, *Denki Mikimoto Kōkichi*, pp. 52-54.

⁹⁹ From the late 1950s, historians began to argue that Ogawa began his pearl oyster propagation venture before Mikimoto. Surviving letters indicate that Mikimoto communicated frequently with Ogawa. See Ozeki Nobuaki, “Shinju kaigan (5),” *Shinju* v. 2 n. 8 (1 August 1959), pp. 20-21; Ōbayashi, *Mikimoto Kōkichi*, pp. 36-38.

¹⁰⁰ Kuru, Tarō, *Shinju no hatsumeisha wa dare ka?: Nishikawa Tōkichi to Tōdai purojekuto* (Tokyo: Keisō shobō, 1987), p. 43.

gathering.” The proposed regulations suggested prohibited diving times (no gathering during the spawning season), prohibited sizes (no gathering of juvenile pearl oysters), prohibited spaces (no moving of rocks to which pearl oysters might attach themselves), and prohibited fishing activities (no dragging of nets along the seafloor in areas where pearl oysters lived).¹⁰¹

Instilling new hierarchies of market-driven value went hand in hand with new propagation methods. Prefectural governors began to invite zoologically-trained proponents of propagation and protection to make tours of pearl oyster bays. They met with villagers who at times held very different ideas about the creatures the boosters themselves considered “pearl oysters”. In formerly little-known pearl oyster fisheries in Ishikawa, Kyoto, and Shizuoka prefectures, officials remarked that villagers saw pearl-producing shellfish (known, boosters noted, by a bewildering range of local names that included “silver oysters (*gin kaki*)” and “short sleeve kimono mussels (*kosode gai*)”) as nothing more than a food source. The boosters’ reports indicate their consensus that villagers needed to see these shellfish, regardless of the names they gave them, as pearl-producing creatures. Some sold the pearls they gathered, but many did not. Mother-of-pearl shell went discarded more often than it was sold. Fisheries boosters decried villagers who ignored the potential of living pearl oysters to produce pearls. They also lamented practitioners of Chinese-style *kanpō* medicine (in the Qing empire and in Japan) who

¹⁰¹ *Suisangyō kyōdō kumiai seidōshi dai 4 kan, shiryōhen 1* (1971), p. 4.

ground pearls into powders for use as *materia medica*, rather than attempting to sell them at higher prices as objects of adornment.¹⁰²

Shima's southern bay of Ago became a testing ground for new policies of propagation and protection. By the late-nineteenth century, Ago Bay had long been known for two things: its large numbers of predominantly female divers, known collectively as *ama*, and its marine products. Abalone came in great quantities from waters just outside the bay; sea cucumbers and pearl-bearing *akoyagai* shellfish could be gathered along its inner shores. Earlier compilations of *materia medica* and other collections of flora and fauna remarked upon the quality of pearls from the Ise area holding them equal to or at times superior to those of Ōmura Bay near Nagasaki. Well into the twentieth century, printers continued to sell guides to the famous people, products, and places of Shima; none failed to mention the *akoyagai* shellfish that populated Ago Bay. People who lived in Ago Bay and neighboring inlets supported themselves through a mixture of farming and fishing. The proportions of that mixture varied widely among Ago's coastal residents. Along the bay's north shore, farming activities filled the bulk of villagers' working days. Elsewhere, especially along the clawlike peninsula that sheltered the southern edge of the bay, fishing and diving shaped men's and women's lives. Fishers dragged nets from shore or from small boats to gather sardines and other fish; their catch could be eaten or used as live bait in the lucrative bonito fishery. Divers and tongers had long gathered pearl oysters in the inner bay, taking

¹⁰² For Ishikawa, see "Shinjubo no setsu," *Nōshōmushō Kawarada Moriharu suisan kōwa hikki* (1889), pp. 50-61. For Shizuoka, see Kawarada Moriharu, "Shinjubo no setsu," *Suisan kairiyō setsu* v. 2 (Shizuoka, 1890), pp. 12-23. see For Kyoto, see "Tango Maizuruwan no shinjugai," *Yomiuri Shinbun*, 7 Jan. 1897.

shellfish for their meat as well as for the occasional pearl. The warmer months between May and August were generally considered the best times for diving. The divers' main catch was the abalone on the Pacific Ocean coast, but they occasionally ventured to the inner bay two to three to a vessel, wearing rope belts, carrying short sticks to root out shellfish, and depositing their catch in floating wooden buckets.¹⁰³ Female divers, drag netters on small boats, and tongers took *akoyagai* at all times of the year. "This fishery depends in large part on luck," noted a prefectural compendium of Mie's fisheries, published for inclusion at Japan's first national fisheries exposition two decades earlier in 1883. "At times you don't even get one pearl in a hundred shellfish. But if you are lucky you can get two or three pearls for every ten shellfish."¹⁰⁴

In July 1889, representatives from nine Ago villages made an agreement among themselves to implement wide-ranging reforms along the shores of the bay. Only pearl oysters over four years old would be taken. Tools and diving methods would be limited to "customary practices." Pearl oyster propagation sites would be established and marked off for the exclusive use of member villagers. Villagers would put stones in the water ahead of the spawning season so that free-swimming juvenile oysters (also called spat) might attach to them. And, perhaps most critically, no gathering would take place during the spawning season—which villagers' regulations took to last from February to May each year.¹⁰⁵ Within a short time, however, the Ago Bay villagers' pearl oyster regulations

¹⁰³ *Mie ken suisan zukai* (Tōkai suisan kagaku kyōkai/Umi no hakubutsukan, 1984).

¹⁰⁴ *Mie ken suisan zukai*.

¹⁰⁵ Sasaki Chūjirō, "Shinjugai chōsa hōkoku," *Suisan chōsa hōkoku dai 1 kan* (Nōshōmushō, 1908), 43-44.

would become a flashpoint of contention. A well-publicized exhibition of Ago Bay's local shellfish provided the spark.

The *Akuariyumu*

In April 1890, Mikimoto headed east once again for Japan's Third Domestic Industrial Exhibition. Mikimoto brought to Tokyo's Ueno Park visions of stable marine product supplies, along with several dozen of Shima's living pearl oysters and a few *Ise ebi* spiny lobsters.¹⁰⁶ Unlike the sea cucumbers and pearls Mikimoto had shown at the 1888 Fisheries Society exposition, in Ueno living marine creatures were the stars of the show at one of the exhibition's specially-built halls, which had been fitted with pumps, glass tanks, and sand filters in the manner of what its organizers called an "*akuariyumu*."¹⁰⁷ Viewers and exhibitors soon realized, however, that the close-packed glass cases and finicky seawater delivery apparatus doubled as an efficient apparatus for killing marine animals.¹⁰⁸ Only Mikimoto's pearl oysters, it seemed, remained unaffected by the carnage that swirled around them. Years later, Mikimoto would reveal the secret of his healthy shellfish. He had stashed a clutch of Shima pearl oysters in Tokyo Bay; early each morning he had several dozen brought in to replace the ones that had expired overnight.¹⁰⁹

¹⁰⁶ *Dai 3 kai kokunai kangyō hakurankai shinsa hōkoku* (1891), p. 662.

¹⁰⁷ *Dai 3 kai kokunai kangyō hakurankai shinsa hōkoku* (1891), p. 683.

¹⁰⁸ *Dai 3 kai kokunai kangyō hakurankai shinsa hōkoku* (1891), pp. 663-664.

¹⁰⁹ Ototake Ai, *Chichi Mikimoto Kōkichi o kataru* (Tokyo, 1993), pp. 59-60.

Yanagi had earlier suggested to Mikimoto that he meet with another fellow member of the Fisheries Society, the Johns Hopkins-trained Tokyo Imperial University zoologist Mitsukuri Kakichi. Mitsukuri and Kishinoue Kamakichi, one of Mitsukuri's students, were both acting as judges of the menagerie of aquatic creatures that had been put on display. Toward the end of May, Mitsukuri decided to publicly dissect several of Mikimoto's pearl oysters. He divided them by sex and determined that all were ready to spawn. Mitsukuri described the encounter with Mikimoto his pearl oysters in detail in a speech delivered to the Fisheries Society just two months later in July 1890.

Many pearl oysters grow near Toba, in Mie Prefecture's Shima region. Several specimens were submitted to the domestic exhibition. Living oysters were also exhibited. I heard from a man who had come to Tokyo for the exhibition that pearl oysters were being harvested excessively and that they were becoming scarce. When the Ministry of Agriculture and Commerce issued its directive, fishers there made an agreement among themselves. They set the several months after June 1st as the gathering season. Gathering at other times was to be prohibited. This effort certainly deserves our praise. However, I wondered how they had determined that gathering pearl oysters after June 1st would not cause any harm. The man at the exhibition told me that since the oysters spawn around September, there would be no harm in gathering them during the summer months. The problem is that a September spawning season is exceedingly unusual for animals of the edible oyster family. I asked the man how it was confirmed that the pearl oysters spawned in September. He replied that, at that time of year, small shellfish could be found stuck to ropes and stones. At this point I knew that the man's observations were mistaken. This is because it takes some time before shellfish appear in shell form. The pearl oyster's spawning season occurs before the appearance of the tiny shells. There was no doubt that the spawning time was in the summer months—precisely when the fishers had established a gathering season.

At any rate, since there were living pearl oysters at the exhibition, I looked into whether it might be possible to examine several of them under a microscope. On that day, May 15th, I determined that that the specimens were full of eggs and sperm. I could not be entirely sure after examining only two or three specimens, but it was clear that the summer months during which it had been determined that pearl oysters could be safely gathered in fact corresponded to the pearl oyster spawning season. In spite of the fishers' agreement, this gathering season was bound to cause great harm. This could indeed be called a blunder born from the inability to apply scientific principles...In any case, the conditions surrounding pearl oyster spawning should be studied scientifically. The results of this research could then be used to forge effective gathering agreements. Looking into methods for propagating and protecting pearl oysters will bring large benefits. Surely there are further profits to be had from expanding this research to other areas where pearl oysters are found.¹¹⁰

¹¹⁰ Mitsukuri Kakichi, "Suisan jigyōjō gakujutsu no ōyō," *Nihon taika ronshū* v. 3 no. 1 (1891): pp. 106-107.

Mitsukuri's observation of Shima's *akoyagai* pearl oysters put the Ago Bay villages' regulations, quite literally, under a microscope. Mikimoto also saw a chance to learn more about fisheries science for himself. Immediately following the 1890 Ueno exposition, Mikimoto travelled with Mitsukuri to the Misaki Marine Biological Station, located along the coast south of Yokohama. Mitsukuri and his associates spent a week tutoring Mikimoto on biological understandings of pearl oyster development.

Mitsukuri's interest in Mikimoto's shellfish stemmed in part from a decade-long *suisan* fisheries booster interest in pearls. The Fisheries Society of Japan took up the possibility of engaging in global markets for pearl and mother of pearl almost as soon as its members began to meet in 1882. One those members, Takamatsu Kazuma, argued for pearl oyster cultivation as a potentially lucrative fishery at a January 1883 meeting. Takamatsu explained that the most suitable varieties of shellfish could be found off the coasts of several areas in Japan, including the region of Bizen around Nagasaki and Ise in Mie prefecture.¹¹¹ He further emphasized that pearl cultivation could be profitably adapted from practices that had been long employed in freshwater environments in China. As Takamatsu made clear, methods of stimulating oysters to produce pearl-like objects had been used "since ancient times."¹¹² It is unclear to what extent Mitsukuri engaged with reports of Chinese pearl induction methods as they circulated among the Fisheries Societies' members in the early 1880s. What is clearer is that in June 1889, much of the substance of Takamatsu's report made an appearance in *Dobutsugaku zasshi*, the

¹¹¹ Takamatsu Kazuma, "Shinjugai no setsu," *Dai Nihon suisankai hōkoku* n. 13 (March 1883), p. 4.

¹¹² Takamatsu, "Shinjugai no setsu," p. 4.

zoological journal Mitsukuri had helped to found.¹¹³ While at Misaki, Mitsukuri and his students also introduced Mikimoto to the possibility of inducing pearl oysters to produce pearls on demand.

Mitsukuri's overseas training disposed him toward the study of shellfish development. Historian of biology Isono Naohide has argued that Mitsukuri Kakichi's time spent as a doctoral student with the Johns Hopkins embryologist and edible oyster expert William Keith Brooks prompted his sustained efforts to pursue fisheries research in Japan.¹¹⁴ While at Hopkins Mitsukuri participated in studies of edible oysters and other economically important American marine creatures at the itinerant summer marine research program Brooks had started, the Chesapeake Zoological Laboratory. Practical matters suffused the work of Brooks and his students. As historian of science Christine Keiner has written, "Given his interest in popularization, it is not surprising that Brooks sought to apply his scientific expertise to a major economic problem. Far from being anomalous, Brooks's applied biological work reflected the centrality of embryology in late-nineteenth-century biology. His analysis of developmental processes addressed central issues related to the control of life: agriculture."¹¹⁵ Soon after returning from the United States and a stint at Cambridge University, Mitsukuri called for a marine research

¹¹³ "Jinkō shinju seizōhō," *Dōbutsugaku zasshi* v. 1 n. 8 (15 June 1889), pp. 261-262.

¹¹⁴ Mitsukuri became a professor at Tokyo Imperial University in 1882. Isono Naohide, *Misaki rinkai jikkensho o kyorai shita hitotachi: Nihon ni okeru dōbutsugaku no tanjō* (Tokyo: Gakkai Shuppan Senta, 1988).

¹¹⁵ Christine Keiner, "W. K. Brooks and the Oyster Question: Science, Politics, and Resource Management in Maryland, 1880-1930," *Journal of the History of Biology* 31 (1998), p. 387.

program in Japan along the lines of the Chesapeake summer laboratory and other marine research facilities that were taking shape at Woods Hole in Massachusetts.¹¹⁶ Mitsukuri and a colleague, the recently appointed Tokyo Imperial University zoology lecturer Ishikawa Chiyoatsu, stressed that having a marine zoological laboratory in Japan would not only provide benefits to the university, but might also promote a number of practical goals.

If we were to establish a laboratory now on a suitable site, the following benefits could be envisioned: First, aiding the advancement of knowledge. Second, helping the fisheries industry. For example, a fishery like abalone not only serves as food for the Japanese people, but is also exported to foreign countries in very large quantities. Therefore its cultivation is of the utmost importance. In order to do this we must clarify its developmental process and behavior. When we have understood its development process, we will be able to intervene and propagate it. However these things will all be difficult to do if there is no research by the coast.¹¹⁷

Mitsukuri and Ishikawa's appeals bore fruit. The Misaki Marine Biological Station opened in 1887 as a publicly funded affiliate of Tokyo Imperial University. It soon became the center of marine zoology and fisheries research in Japan. As the first director at Misaki, Mitsukuri Kakichi spurred the study of aquatic cultivation in particular.¹¹⁸ Mitsukuri saw Japan's most pressing fisheries problems in embryological terms. The issue was, for him, quite simple: if fishers caught animals before they were able to lay eggs, populations would inevitably fall over time. "Everyone knows that Hokkaido abalone are getting smaller, but people think that because the oceans are so vast it makes no difference how

¹¹⁶ Mitsukuri Kakichi, "Kaki no hassei," *Dai Nihon suisankai hōkoku* no. 13 (March 1883), pp. 25-30.

¹¹⁷ Quoted in Isono, *Misaki rinkai jikkensho*, p. 29-30. Upon the opening of the Misaki laboratory, Mitsukuri promptly began studies of abalone development.

¹¹⁸ At the time of Misaki's opening, Tokyo Imperial University had three other affiliated research institutions: the Ishikawa Botanical Gardens, the astronomical observatory, and the Seismological Experimental Station. See Isono, *Misaki rinkai jikkensho*, p. 32.

much you gather,” Mitsukuri wrote. “Things don’t work like this. Nature doesn’t provide everything humans ask for. Simply placing an order won’t bring you as much as you want.”¹¹⁹

For zoologists like Mitsukuri Kakichi, the answer to excessive gathering was intervention in the development of marine creatures through practices of cultivation. Like William Keith Brooks, Mitsukuri argued that marine fisheries were next in importance to agriculture. And if agriculture required fixed claims over space, so too did marine cultivation. Mitsukuri found in Hiroshima’s edible oyster (*kaki*) cultivation and Tokyo Bay’s seaweed (*nori*) cultivation two models of private fisheries ownership for which his mentor Brooks had long campaigned in vain in the Chesapeake. “Abolishing common fisheries and employing a system of leased plots (*shakku*) to make edible oyster farms with the same status as private land is essential to the development of the marine creature cultivation industry,” Mitsukuri wrote after his first major survey of Hiroshima Bay in 1883.¹²⁰ Of Tokyo Bay he gushed that “the sight of seaweed poles standing in the water is just like a city or a town on land. Every time I pass by it never ceases to amaze me.”¹²¹

¹¹⁹ Mitsukuri, “Suisan chōsa ni tsuite,” pp. 233-234.

¹²⁰ Mitsukuri Kakichi, “Kaki no hassei,” *Dai Nihon suisankai hōkoku* n. 13 (March 1883).

¹²¹ Mitsukuri, “Suisan chōsa ni tsuite,” p. 238.

From Pearls to Pearl Oysters in Ago Bay

Upon Mikimoto's return to Shima in the fall of 1890, he immediately embarked on efforts to propagate pearl oysters. His reputation as someone who knew how to handle living pearl oysters increased apace.

In August 1891, Mikimoto brought living pearl oysters to an enclosed saltwater pen (*ikesu*) along the coast near Toba for the viewing pleasure of the future Taishō emperor, who had come on an excursion from Ise shrine. Imperial household officials oversaw the opening the first batch of *akoyagai*. When no pearls were found, they bought a hundred more from Mikimoto. The next seventeen shellfish yielded three pearls. The *Yomiuri* reported that the young prince “could not contain a flush of joy” after being handed one of the valves, pearl nestled inside.¹²² Several months later, Mikimoto received a request to transport several thousand living *akoyagai* pearl oysters from Shima to Hiroshima Bay, where Ministry of Agriculture and Commerce official Yamamoto Yukie was pursuing a Hiroshima Prefecture-sponsored attempt to propagate pearl oysters and induce them to produce pearls. Yamamoto turned the acquisition of the pearl oysters itself into a test of best practices for shipping living shellfish. The pearl oysters that arrived after a five-day journey by train and steamship had almost all perished. Mikimoto's path from Shima to Hiroshima reflected his roots as a jobber of marine products: a small skiff with baskets full of oysters on either side that could be lowered into the sea while the boat was at rest. Yamamoto noted that Mikimoto's slow-and-steady method, “an established way for

¹²² *Yomiuri shinbun*, 17 August 1891.

transporting live abalone,” had taken over two weeks: 133 hours moving, 186 hours resting in the water. However, it had resulted in “only two or three” oyster deaths out of over three thousand.¹²³ It was no accident that fisheries officials like Yamamoto Yukie hoped to move pearl oysters to Hiroshima and other areas with established private cultivation spaces. Amid widespread zoological visions of terrestrial agriculture and landed ownership in the water, Mikimoto Kōkichi emerged as a fixer who could get living pearl oysters to areas where cultivation already reigned supreme. Before long, however, boosters turned to Ago Bay itself.

Mikimoto’s star was on the rise within the imperial household and within Meiji Japan’s fisheries community when marine zoologist (and ardent sericulturist) Sasaki Chūjirō came to survey Ago Bay’s pearl oysters in June 1892. Sasaki’s report could barely restrain his disappointment at what he saw as the outright conceptual and practical failure of village-led efforts to protect shellfish populations, even as he praised Mikimoto’s pearl oyster propagation efforts. Sasaki arrived just after the third full year of the ban on pearl oyster gathering to which nine of Ago Bay’s villages had agreed. Like Mitsukuri in the aftermath of his pearl oyster dissection in Ueno, Sasaki zeroed in on the villagers’ understanding of the spawning season, which they had dated from February to May. This was a season based, as Sasaki pointed out, only on “fishing custom,” not on an “accurate survey.”¹²⁴ Based on Sasaki’s own survey, and in line with Mitsukuri’s earlier observations,

¹²³ Yamamoto Yukie, “Shinjugai ishoku shiken hōkoku dai 1 kai shiken,” *Suisan chōsa hōkoku dai 1 kan* (Nōshōmushō, 1908).

¹²⁴ Sasaki Chūjirō, “Shinjugai chōsa hōkoku.”

Sasaki pointed out that spawning occurred in June and July—precisely when villagers allowed gathering to take place.

For Sasaki, there was a conceptual problem with the proposed prohibited fishing season. Even more distressingly to Sasaki, however, was what he saw as the practical problem of overfishing at the root of declining pearl oyster populations. One example stood out. Villagers from Fuseda, who lived along the southern edge of the bay, had paid the northern bay village of Tategami for the right to fish sardines in the north. Sasaki claimed that as many as seventy or eighty Fuseda divers headed each day to Tategami's coasts under the pretense of fishing for sardines. In fact, he wrote, they were taking as many as five hundred pearl oysters per person, per day. A back-of-the-envelope calculation suggested that over seven million pearl oysters were being gathered each season.

What were the lessons to be drawn from Sasaki's survey? Three things stood out. First, the northern half of Ago Bay had the greatest potential for shellfish propagation. Second, shellfish gathering would need to be strictly regulated throughout the bay, with a blanket prohibition between the June-to-August spawning season. Third and finally, promising sites along the north of the bay would need to be reserved and demarcated.¹²⁵ The bottom line for Sasaki was that villages were operating under the wrong spawning season and were incapable of enforcing restrictions. Local fisheries conservation had failed.¹²⁶ In contrast to the story of village failure, Sasaki introduced Mikimoto Kōkichi's

¹²⁵ Sasaki Chūjirō, "Shinjugai chōsa hōkoku," pp. 48-51.

¹²⁶ Sasaki Chūjirō, "Shinjugai chōsa hōkoku," pp. 45-47.

propagation site, located in Shinmei village waters not far from the once-uninhabited island of Tatoku in the northern half of Ago Bay, as a success story of applied zoological methods. Pine logs affixed with clay tiles lined parts of the seafloor, an effort to make space for free-swimming juvenile pearl oysters to affix themselves. The propagation site in Shinmei was the only one to use such methods, Sasaki added.¹²⁷

The Island of Abundant Virtue

By the early 1890s, compilations of Shima merchants labeled Mikimoto as a pearl dealer (*shinjushō*).¹²⁸ Mikimoto's treaty port connections brought him samples of Chinese freshwater pearl culture shells. He soon consulted with Mitsukuri and Sasaki about his growing plans for what one paper called "the cultivation of artificial pearls."¹²⁹ Mitsukuri, in turn, brought Mikimoto new customers. In 1894, for example, he passed Mikimoto an order for pearls from the United States embassy.¹³⁰

Yet as Sasaki's report on Ago Bay indicated, Mikimoto was focusing his energies not only on pearl sales, but also on pearl oyster propagation and, eventually, on the surgical induction of pearls in those shellfish. Late in 1893, Mikimoto secured an

¹²⁷ Sasaki Chūjirō, "Shinjugai chōsa hōkoku," p. 46.

¹²⁸ Matsuda Hōkan, *Mie kenka shōkō jinmeiroku* (Mie nippōsha, 1893), p. 264. Mikimoto remained a dealer in other marine products. Those attending fisheries meetings in Mie Prefecture continued to hear Mikimoto's opinions on sea cucumber processing.

¹²⁹ "Jinkō shinju no yōshoku o keikaku," *Yūbin hōchi*, 22 February 1893, in *Meiji nyusu jiten dai 5 kan* (Mainichi Communications, 1985), p. 765.

¹³⁰ Mitsukuri relayed the order in a July 1894 letter to Mikimoto. Reprinted and transcribed in part in Ototake, *Chichi, Mikimoto Kōkichi o kataru*, p. 62.

agreement with the village of Shinmeinoura to lease a small island located within the village's customary fishing waters in Ago Bay. For five yen a year, Mikimoto gained access to the previously uninhabited landmass and sixty thousand *tsubo* (nearly fifty acres) of its surrounding waters.¹³¹ Mikimoto continued his pearl culture experiments and, in late 1894, applied for a patent in Tokyo. He received Japanese patent number 2670 a little over a year later in January 1896. Mikimoto's first patent was entitled "a method for causing the deposition of artificial pearl material." It described an "improvement" to a process for crafting semi-spherical objects that would be placed along the inside edge of a living pearl oyster's shell. If all went well, over the next several years the inserted objects would be covered with nacre (also known as mother-of-pearl) secreted by the shellfish.¹³²

Mikimoto's first patent undergirded his entry into the full-time business of pearl cultivation. Immediately after getting his patent, Mikimoto moved much of his extended family—at first ten people, but with subsequent additions—to the island he had leased in Ago Bay. There they worked alongside female *ama* divers whom Mikimoto had begun to hire from surrounding villages. Accounts of Mikimoto's company later characterized the years following the move to the island as some of the most difficult its new residents would experience. Mikimoto's sister Morii Misa was among the first group to arrive on the island:

¹³¹ Genji Keita, *Shinju tanjō: Mikimoto Kōkichi den* (Kōdansha, 1980), pp. 76-77.

¹³² "Jinkō shinju soshitsu hichakuhō" (人工真珠素質被着法), Japanese Patent no. 2670 (1896). Accessed via the Industrial Property Digital Library (IPDL) www.ipdl.inpit.go.jp/.

The hardest thing was that there was no fresh water. The island was completely rocky. The soils were such that you had to dig very deep before water would come up. When you did hit water it was salty and cloudy. We didn't have enough things—I didn't have any girlish *kimono* to wear. When my husband brought me *geta* sandals with red thongs back from Toba they were the talk of the island. There were no other flashy red things around. We ate plenty of fish, which the *ama* divers caught for us in large amounts, but we made do without much rice or firewood.¹³³

During this time Mikimoto continued to trade in marine products to raise money for the cultivation venture. Amid Mikimoto's comings and goings, the island underwent a course of terrestrial colonization in miniature. The island's residents dug wells, cleared rocks, transplanted five or six hundred trees, built houses, and made structures where they could surgically manipulate living pearl oysters and disassemble dead ones.¹³⁴ The seafloor around the island changed as well. *Ama* divers put rocks and tiles on the seafloor and separated pearl oysters into different plots according to their age. Mikimoto appointed his brother-in-law Kume Nantarō as head of cultivation operations on the island. Once a shellfish reached around three years of age it headed to a rough and ready seaside laboratory where several semi-spherical nucleating objects could be inserted between the living oyster's shell and soft tissues. By the end of June 1896, Kume was reporting to Mikimoto that "implanting one thousand [nuclei] each day is an easy task."¹³⁵

As 1898 drew to a close, the residents of the island prepared to gather up Mikimoto's first large group of surgically manipulated pearl oysters. In December

¹³³ Ototake, *Chichi, Mikimoto Kōkichi o kataru*, p. 89.

¹³⁴ Retrospectives of Mikimoto's "clearing" of Tatoku could be found in articles like "Sekai yuiitsu: Shinju yōshokugyō no kaisan," *Taiheiyō* v. 4 n. 18 (15 Oct. 1905). The figures for the trees come from *Kokumin shinbun*, 11 May 1912.

¹³⁵ This is from Kume's 28 June 1896 letter to Mikimoto, quoted in Ototake, *Chichi Mikimoto Kōkichi o kataru*, p. 91. Kume found that one of his biggest problems was getting the shellfish to open up while out of the water.

Mikimoto and others on the island began to open up the six and seven-year-old shellfish his divers had brought in. Word spread to Tokyo. The new Minister of Agriculture and Commerce, Sone Arasuke, dropped by to observe. Mikimoto passed his five best pearl specimens to Sone to forward to the Imperial Household Ministry. He had the pearls put in a box marked with the label *yōshoku shinju*.¹³⁶ It was, at one level, a play on a calligraphy sample written with the three characters *yō shinju*—*yō* 養, to cultivate or raise, and *shinju* 真珠, pearl—that Imperial family scion Prince Komatsunomiya Akihito had sent the budding pearl entrepreneur back in 1891. It was no accident either that, at that moment, *yōshoku* and attendant ideas of marine cultivation were on the table for legal reform.

Sone suggested that Mikimoto restyle not only the name of his pearls but also the name of his farm. Mikimoto promptly did so. The island's name came to be rewritten as Tatokujima, or the "Island of Abundant Virtue."¹³⁷

The 1901 Fisheries Law and the Legal Demarcation of Cultivation

Mikimoto's relationships with government officials and zoologists deepened amid longstanding debate over the legal basis of Japan's coastal waters.

¹³⁶ *Yomiuri shinbun*, 12 March 1899.

¹³⁷ Kitagawa Yoshihiko, "Kateichū gakkō to tokushi naru shinju yōshoku jigyō," *Shimin* v. 3 n. 13 (Feb. 1909), p. 48.

In 1875, the young Meiji government claimed state control over all saltwater coastlines and most other bodies of freshwater in the Japanese empire. Coastal space was to be state-controlled space; existing fisheries arrangements would be nullified.¹³⁸ In the new fisheries geography, uniform boundaries marked where certain methods could be employed, specified creatures targeted, and national regulations enforced. It was a move with analogues in the massive arable and forested land reform efforts of the early 1870s.¹³⁹ But as with the drawn-out and at times violently contested transfer of forestlands from commons arrangements to a system of individual titles and taxes paid in cash rather than in kind, the 1875 fisheries reforms met with opposition on a number of fronts. Facing resistance from village fishers and others, like the trap-owning entrepreneurs who had emerged along herring-rich shorelines to cater to domestic demand for fishmeal fertilizer, the Meiji government put the proposed system of a fully state-licensed coastal fishery on hold in the summer of 1876, only months after it had issued the original decree. The state reverted to a de facto policy of permitting local determination of fisheries access even as it retained formal claims over coastal waters. This arrangement lasted until the mid-1880s, when a series of prefectural ordinances began requiring the formation of licensed fisheries associations with access to spatially-defined coastal fisheries.¹⁴⁰ By the late 1880s and into the 1890s, discussion had moved from the pros and cons of outright state control

¹³⁸ See Ninohei Tokuo, *Meiji gyogyō kaitakushi*, (Tokyo: Heibonsha, 1981).

¹³⁹ See, for example, Conrad Totman, *Japan's Imperial Forest: Goryōrin, 1889-1945* (Global Oriental, 2007).

¹⁴⁰ Ninohei, *Meiji gyogyō kaitakushi*. See also David Howell, *Capitalism from Within: Economy, Society, and the State in a Japanese Fishery* (Berkeley: University of California Press, 1995); and Arne Kalland, *Fishing Villages in Tokugawa Japan* (Honolulu: University of Hawaii Press, 1995).

to ongoing debates about relative importance of inscribing village fishery boundaries on the one hand, and promoting new uses for coastal waters on the other.

The prevention of overfishing and efforts to raise marine creatures in the water came to form two interlinked goals of coastal conservation along the shorelines of Meiji Japan. Protection meant keeping people from harvesting marine creatures that might continue to grow and lay eggs. Propagation meant giving marine creatures a chance to reproduce. Nevertheless, protection and propagation—or, in a related sense the protection of propagation—did not inherently imply a profit-making activity, in the sense that policies for propagating fish did not resolve the problem of determining whether propagated fish belonged to everyone, someone in particular, or no one at all.

With the landmark 1901 Fisheries Law (*gyogyōhō*), the marine *propagation* of some kinds of marine creatures, including pearl oysters, for the first time took on the explicitly entrepreneurial character of *cultivation*.¹⁴¹ Commercial aspirations rang out loud and clear from the law's very first line: "The term 'fishery' (*gyogyō*) in this law refers to the catching or cultivation of marine animals for the purpose of making a profit."¹⁴² Framers of the Fisheries Law sought to redefine individual and associational rights and responsibilities over meticulously surveyed plots of coastal ocean space across the Japanese empire. The law did not create new ways of working with aquatic creatures—or even the notion of leasable, exclusive fisheries. Rather, it opened the way for zoologists, lawmakers,

¹⁴¹ The law became known in retrospect as the “old” Fisheries Law after its revision in 1911. Both were referred to as the “Meiji” Fisheries Laws after thoroughgoing post-World War II reforms.

¹⁴² Kumaki Jihei, *Jitsuyō gyogyōhō kaishaku* (Toyokuni shinbunsha, 1902), p. 5.

entrepreneurs, and village fishers alike to redefine evolving practices under standardized national rubric of rights. The law spelled out a system of marine coastal management that attempted to cover the full spatial and technological gamut of near-shore fisheries activities along the growing Japanese empire's eighteen-thousand-plus kilometers of shoreline. It separated fisheries between exclusive village fishing rights gained through customary use and licenses for demarcated and fixed-net fisheries. In Tokyo, the Ministry of Agriculture and Commerce defined several categories of fishing practices. In provincial capitals, prefectural governments determined whether or not—and, importantly, how soon—an applicant might receive authorization for customary or permit-based rights.

Above all, the Fisheries Law struck a blow against the idea of the multi-village common fishery. As the new Minister of Agriculture and Commerce explained to members of the Diet upper house who were preparing to vote on the proposed law, villagers would inevitably overfish when they shared fisheries with other villages: “If they come to gather abalone they gather it with abandon; if they come to cut kelp they cut it with equal abandon.”¹⁴³ The solution to the problem of inter-village commons was the image of state waters as separately tended gardens: “Put simply, there will be a garden in front of each village. Because the village fishery will take place in this garden, each village will conserve for itself.”¹⁴⁴ Along similar lines, demarcated cultivation licenses were intended to be long-term concessions in which an individual “alone controls the state-

¹⁴³ *Shūgiin gyogyōhōan shinsa tokubetsu iinkai sokkiroku*, dai 1 go, p. 8, in *Teikoku gikai kizokuinkai sokkiroku* Meiji-hen 17, dai 15 kai gikai 1900 (Tokyo daigaku shuppankai, 1986).

¹⁴⁴ *Shūgiin gyogyōhōan shinsa tokubetsu iinkai sokkiroku*, dai 1 go, p. 8.

owned waters and alone profits from it.”¹⁴⁵ The Fisheries Law thus reflected a strong central government preference for individual fisheries management by one person, one company, or one village fishing association.

By the early twentieth century, individuals, companies, and villages alike had opportunities to gain exclusive access to ocean space for activities once considered part of “protection and propagation” but which were, increasingly after 1901, grouped together as “cultivation.” Cultivation was part of a larger vision of governable, productive, sustainable, and conflict-free fishery space, described by state fisheries boosters and aquatic cultivators alike with the terrestrial and spatial metaphor of a well-tended coastal “garden.” Not long after the Fisheries Law was enacted, a flood of commentators rushed to explain the implications of the new fisheries regime. The Fisheries Law, known in Japanese as the *gyogyōhō*, was a reordering of the fishery as *gyogyō*, the “business of catching.” What constituted catching, however, was not clear. The distinction between “catching” and “cultivating” marine creatures rarely escaped mention in discussions of the new law. As chief architect of the Fisheries Law and acclaimed “Old man of the fisheries” Murata Tamotsu had put it during 1899 House of Peers debates over the law, “we never call someone who raises fish a fisher (*gyogyōsha*).”¹⁴⁶ But almost all agreed—as other officials involved in the law’s crafting had already hinted—that even if cultivation was not

¹⁴⁵ *Shūgiin gyogyōhōan shinsa tokubetsu iinkai sokkiroku*, dai 1 go, p. 8.

¹⁴⁶ *Teikoku gikai kizokuinkai sokkiroku* Meiji-hen 10, dai 14 kai gikai 1899 (Tokyo daigaku shuppankai, 1986), p. 157.

catching, it was, for legal purposes at least, a subset of fisheries more generally.¹⁴⁷ One observer summed up the consensus among Meiji fisheries boosters:

Catching and gathering” (*saiho*) refers to catching (*hokaku*) fish and gathering (*saishū*) shellfish. Cultivation (*yōshoku*) refers to the breeding and raising of marine plants and animals. Afterwards these are caught or gathered up and sold. However, cultivation implies the human manipulation of marine plant and animal propagation and the presence of facilities to raise those creatures to maturity. This is what distinguishes “catching and gathering” from “cultivation.”¹⁴⁸

Cultivation entailed “putting up scaffolding for oyster and seaweed culture, using rocky shorelines or throwing rocks in the water for the cultivation of pearl oysters and seaweed, moving mature ‘parent shellfish’ (*oyagai*) or casting ‘seed shellfish’ (*tanegai*), spreading out food, removing harmful enemies, and preventing one’s own creatures from escaping.”¹⁴⁹ What made the difference to interpreters of the law was the presence or absence of human artifice during a marine creature’s development—and the type of space in which that development took place. Marine cultivation, at heart, meant a “world of fields and fences” in waters across the empire.¹⁵⁰

¹⁴⁷ Others in the House of Peers debates noted that aquatic cultivation (*yōshoku*) fell under the rubric of fisheries (*gyogyō*) in Europe and the United States, an interpretation that eventually stuck in the final version of Japan’s Fisheries Law. See *Teikoku gikai* (1899), p. 157.

¹⁴⁸ Kumaki Jihei, *Gyogyōhō hayawakari* (Toyokuni shinbunsha, 1903), p. 3.

¹⁴⁹ Kumaki, *Jitsuyō gyogyōhō kaishaku*, p. 89.

¹⁵⁰ As William Cronon termed it in the seventh chapter of his classic *Changes in the Land: Indians, Colonists, and the Ecology of New England* (MacMillan, 1983).

Ice or Charcoal

At the turn of the twentieth century, Mikimoto and the technicians and divers on his growing island headquarters were working with hundreds of thousands of shellfish each year. Concerns for continued production attended Mikimoto's 1903 application for a demarcated fisheries license to cultivate *akoyagai* along the shores of several nearby Ago Bay villages. It was the first pearl oyster-related application in Japan under the new national Fisheries Law.¹⁵¹

Faced with Mikimoto's application to gain exclusive access to northern Ago Bay waters for the raising of pearl-bearing *akoyagai* shellfish, fishers living in the southern Ago Bay village of Wagu lodged a complaint with the Mie prefectural government on 2 May 1903. Deploying the full vernacular of peasant protest, they warned of the disaster that might befall net and pole fishers like themselves if the bay were to become off-limits for fish catching: "The regulations promulgated in the Fisheries Law are far removed from this county's customary practices. They have delivered the most thoroughgoing blow to fisherfolk like us, who let out sighs of grief day and night."¹⁵²

Their suspicion was that Mikimoto's operations had the potential to cover much of the surface of the bay. If that were to happen, Wagu village leaders realized, pole and net fishing would be certain casualties.

¹⁵¹ Ushiomi Toshitaka, *Gyoson no kōzō: gyogyōken no shakaiteki kenkyū* (Iwanami shoten, 1954), p. 237.

¹⁵² *Mie kenshi shiryōhen kindai 3: sangyō keizai* (Tsu: Mie ken, 1988), p. 549.

Several years ago a resident of Toba, Mikimoto Kōkichi, established a pearl cultivation site along parts of the village [fisheries] of Shinmei and Ugata. He received public acclaim far out of proportion to his actual results. Treating the promulgation of the Fisheries Industry Law as a golden opportunity, Mikimoto is trying to turn the vast majority of the bay into a demarcated cultivation fishery. The authorities have also been receptive to this. It remains difficult for us to believe that this will happen. Moreover, the [proposed cultivation] areas have no direct relationship to our village's coastal fishing waters. However, if this rumor were to become fact at a later date, it would bring dramatic consequences to pole fisheries, above all the bonito fishery as was noted in some detail in an earlier document. To bring up one example, Mikimoto's business employs innumerable female *ama* divers and makes use of dress diving equipment. Because the divers and equipment disturb the ocean floor, the number of juvenile sardines will progressively decrease. As a result of stones being sunk to the seafloor—stones on which shellfish can be raised—it will not be possible for us to drag our sardine nets. We now have a model case along a portion of the coastal waters off Shinmei and Ugata villages—that is, in Mikimoto's pearl cultivation sites. It is clear, in other words, that Mikimoto's business and the business of catching bait sardines cannot both take place within the same demarcated area. These two fisheries go together like ice and [burning] charcoal.¹⁵³

The view from Wagu was that of a zero-sum game: the start of pearl oyster cultivation looked a lot like the end of sardine fishing. A subsequent Mie prefecture fisheries report summed up these fears in a phrase that officials had heard uttered by some in the bay: “propagating shellfish, killing people” (*kai o zōshoku shite ningen o ayame*).¹⁵⁴ As May dragged on, villagers around Ago waited to see whether the inner bay waters would turn out to be ice or charcoal.

Demarcated cultivation rights, as with other kinds of fishing rights under the 1901 law, were defined both by space and species. When Mikimoto, other entrepreneurs, or village fishing associations applied for cultivation rights, they submitted maps detailing the areas in which they hoped to operate farms and specified the types of creatures they would be raising. Mikimoto's application covered many of the areas where zoologist

¹⁵³ *Mie kenshi shiryōhen kindai* 3, p. 549-550.

¹⁵⁴ *Mie ken shikenjō jigyo seiseki, dai 1 kan* (Mie ken, 1905), p. 59.

Sasaki Chūjirō's 1892 survey had indicated that the greatest populations of *akoyagai* lay, in the northern half of Ago Bay.

The waters overlapped with three village fisheries in areas adjacent to his then decade-old headquarters on Tatokujima. Inlets offered up some of the most contentious spaces for establishing individual village fisheries, precisely because bay waters often served as one or more fisheries shared among fishers residing in multiple coastal villages.¹⁵⁵ After the passage of the 1901 Fisheries Law, one of Ago Bay's northernmost inlets had become the exclusive catch-and-gather fishery of the Ugata village's fishing association. Just to the south, fishing associations in Shinmei village held formalized access rights (*nyūgyoken*) to use waters that had been placed under the control of villagers in Hamajima.

Mikimoto applied for demarcated cultivation on 16 June 1903 directly to the Mie prefectural government. Even before this, he attempted to meet with leaders in all three villages in order to quell opposition to his growing farm. Since his earliest efforts to lease Tatokujima in 1893, mistrust had reigned wherever Mikimoto attempted to negotiate access to land and water. On more than one occasion a county leader served as a facilitator in the leasing discussions. Between June and August of 1903, Mikimoto reached agreements with villagers in the Ugata (2 June 1903), Hamajima (5 August 1903), and Shinmei (31 August 1903). Together, these agreements—the Hamajima accord was drafted with input from Mikimoto supporter Fujita Shirō, who also happened to be one of Meiji Japan's highest ranking fisheries officials—specified that Mikimoto could apply for a

¹⁵⁵ Kalland, *Fishing Villages in Tokugawa Japan*, p. 150.

twenty-year demarcated pearl fishery license extending across what amounted 580,000 tsubo of ocean space—a substantial area of over 190 hectares (more than 470 acres).¹⁵⁶ According to the terms of the agreements, Mikimoto would pay a nominal yearly fee to each village (fifty yen to Ugata, two hundred to Shinmei, and two hundred fifty yen to be split between Hamajima and Shinmei). In Ugata, Mikimoto kicked in another thirty yen per year to gain sea cucumber gathering rights.¹⁵⁷

Villagers in Shinmei and Hamajima waited longer and drove harder bargains with Mikimoto. Unlike Ugata, where farming dominated local discussion, the other two villages had many more residents whose days dragging sardine nets and diving for sea cucumbers were numbered with Mikimoto's impending control of part of the village fishing associations' fisheries.¹⁵⁸ Both included clauses not present in the Ugata agreement. Mikimoto agreed to employ as many of Hamajima's female *ama* divers (and male fishers) as possible. The villagers could continue to catch and gather up creatures inside the demarcated fishery, so long as they did not interfere with the pearl oysters scattered on the seafloor.¹⁵⁹ Mikimoto promised to buy up to five million juvenile oysters per year at prevailing prices from Shinmei villagers.¹⁶⁰ Two years later in 1905, Mikimoto

¹⁵⁶ Mikimoto gained access to around 300,000 tsubo of Ugata's waters and around 280,000 tsubo of Hamajima's waters. In Hamajima's case, this amounted to about forty percent of the village's total coastal fishery. Shinmei fishers held access rights to the Hamajima waters as well. See *Hamajima gyogyō kumiai no ayumi* (1991), pp. 62-64.

¹⁵⁷ Yamazaki Eiji, *Meiji Shimanokuni shiryōshū* (Mie ken kyōdo shiryō kankōkai, 1968), p. 26.

¹⁵⁸ See for example, *Mie ken Shimagun Ugata sonze* (Toba: 1903).

¹⁵⁹ Yamazaki, *Meiji Shimanokuni shiryōshū*, p. 40.

¹⁶⁰ Ushiomi, *Gyoson no kōzō*, p. 238.

signed another twenty-year deal with the leaders of the Tategami village fishing association. Mikimoto received the rights to another half million *tsubo* of demarcated cultivation space within Tategami's catch fishery in return for a one-time payment of ten thousand yen and an exclusive agreement to purchase juvenile oysters from village fishers.¹⁶¹

The Wagu sardine fisher's premonitions of a fully cultivated Ago Bay proved well-founded. Restrictions on shellfish gathering changed villagers' livelihoods, yet the responsibility for increasing the population of pearl oysters would also hinge on village efforts to supply *akoyagai* to demarcated propagation sites. The dichotomy between collecting and cultivation concealed linked livelihoods. Shellfish gathering divers and shellfish cultivating marine entrepreneurs alike became involved in pearl cultivation in Ago Bay and elsewhere in the empire. The raising of pearl oysters along individual villages became a village-wide activity as well. The state's language of rights was a shared space of its own, where catchers and cultivators took part in efforts to gain access to coastal waters.

Mie Prefecture took an interest in providing scientific studies of pearl oyster cultivation and ocean conditions in Ago Bay. A prefecture-funded fisheries experiment station opened in 1899 on a small peninsula near the port of Hamajima. By early 1905, the experiment station was noting a rising tide of marine entrepreneurship in Ago Bay: "Mikimoto controls more than 500,000 *tsubo* of ocean space and has turned it into a

¹⁶¹ Ushiomi, *Gyoson no kōzō*, pp. 242-243.

culture farm. He is actively cultivating pearl oysters. As a result of this venture Mikimoto has done much to help their propagation. In addition, he has disseminated the idea of pearl oyster culture as a business. This has prompted people to think about pearl oysters across the prefecture.”¹⁶² Other village fishing associations and individual entrepreneurs applied for and received demarcated pearl oyster cultivation rights. New boundary stakes popped up throughout southern Mie Prefecture and beyond, marking the growing frontier of a pearl-oyster-driven seafloor land rush.

Mothers of Pearl

For everyone involved in Ago Bay’s emerging pearl oyster economy, shellfish were investments that appreciated over time. One of the the Mie fisheries experiment station’s early reports likened pearl oysters to the premium-bearing debentures issued by Meiji Japan’s Industrial Bank (*kangyō ginkō warimashikin-tsuki saiken*).¹⁶³ The experiment station’s rule of thumb was that a pearl oyster would increase in value by fifteen percent annually. But in the early twentieth century, pearls themselves remained a rare bonus for shellfish cultivators without access to the pearl induction methods Mikimoto had patented. While Mie Prefecture officials likened living pearl oysters to interest-bearing financial instruments, they saw pearls in terms of the windfall payouts given to holders of company debt.¹⁶⁴ Pearl oyster farmers raised shellfish primarily for their shells and

¹⁶² *Mie ken shikenjō jigyo seiseki* (1905), p. 85.

¹⁶³ *Mie ken shikenjō jigyo seiseki* (1905), 85.

¹⁶⁴ *Mie ken shikenjō jigyo seiseki* (1905), 85.

meat—or, increasingly, as livestock they could sell to Mikimoto. Mikimoto, for his part, did not look at pearls as bonuses. As he stressed, “My goal is to make pearls.”¹⁶⁵ Mikimoto’s pearl culture farm intervened in the lives of pearl oysters at scales of the population and the individual. Agreements with several of Ago’s northern villages, moreover, did not only give Mikimoto the right to use a vastly expanded swath of ocean space for pearl cultivation. They also provided him with exclusive access living pearl oysters and divers who could work with them.

Pearl culture added a new layer to Shima’s complex dive labor economy. From the late nineteenth century, observers were convinced that too many divers were working Shima’s waters. Ago villages began to organize diving squads that traveled farther out to inlets along Wakayama’s Kii peninsula. Local population growth and imperial expansion created opportunities in the Korean peninsula as well. From the late nineteenth century, Japanese marine entrepreneurs had brought Ago’s female divers to Korea’s coastlines, where they gathered marine creatures, primarily abalone. A young diver at the turn of the twentieth century thus faced several options for working in the water. She could travel to outside prefectures or even outside colonies for several months between the spring and fall, but faced the prospect of garnished wages and uncharitable evaluation of the quality and quantity of her catch.¹⁶⁶

¹⁶⁵ Mikimoto Kōkichi, “Shinju monogatari” (April 1905), p. 56.

¹⁶⁶ This was still the case well into the twentieth century. See chapter three, “Ama rōdō no genzai,” in Itami Banri, *Ama rōdō mondai no kenkyū* (Tokyo: Ganshōdō shoten, 1917). For a broader survey, see Tsukamoto Akira, “Kindai no Shima ama no deka-segi ni tsuite,” *Mie Dai shigaku* n. 10 (2010), pp. 37-59.

Into the dive labor market stepped Mikimoto, who would hire hundreds of young female divers, most living along the shores of nearby villages, as wage-earning marine farmhands. Female divers would, in time, make up the vast majority of Mikimoto's labor force, but work on the farm was seasonal and pay was low. *Ama* received daily wages (amounting, in 1905, to some twenty to forty *sen* or so a day).¹⁶⁷ Wearing goggles (partly for eye protection and partly so that shellfish would appear larger in their fields of vision), divers worked the bottoms of waters that often ranged from about five to seven meters deep.¹⁶⁸ Mikimoto's busiest time of the year was *doyō* 土用, a summer period of eighty-eight days according to the old calendar that usually started in July according to the new calendar. *Doyō* season was also spawning season, when free swimming oyster spat filled the water.¹⁶⁹ Shifts lasted around an hour at a time, for up to three hours a day if the water was warm enough.¹⁷⁰ Divers placed stones and tiles on the ground to catch as many spat as possible. Once the spat had attached and reached the size of "a one *sen* copper coin"—generally about a year later—they could be transferred to deeper waters before winter's arrival.¹⁷¹ "The seafloor where I place my pearl oysters is more beautiful than a crop field," boasted Mikimoto. "The women have devoted themselves to caring for them. Even when they have no need to, they constantly pluck away seaweeds and do all sorts of

¹⁶⁷ Ototake, *Denki Mikimoto Kōkichi*, p. 115.

¹⁶⁸ Mikimoto Kōkichi, "Shinju monogatari," *Kokoro no hana* v. 9 no. 3 (March 1905), p. 45.

¹⁶⁹ Mikimoto Kōkichi, "Shinju monogatari" (April 1905), p. 53.

¹⁷⁰ Mikimoto Kōkichi, "Shinju monogatari" (March 1905), p. 44.

¹⁷¹ Mikimoto Kōkichi, "Shinju monogatari" (April 1905), p. 53.

upkeep.”¹⁷² Mikimoto portrayed the Island of Abundant Virtue, moreover, as a place of where his female divers could be reformed. “I make the women in my employ take *shamisen* lessons and play *shōgi* on the estate,” said Mikimoto. “Anyone who can’t play is not a woman to me. It’s the custom not to have the women work while they are on the estate. As a result their work [in the water] is incredibly strong.”¹⁷³

As Mikimoto gained control of additional ocean space, he stocked his farm’s waters with living pearl oysters from the surrounding bay. By the first decade of the twentieth century, Mikimoto’s farm had settled into a routine of raising individual pearl oysters until they were three years old, at which point, Mikimoto said, “they get put to work (*shigoto ni kakaru*)” in surgical rooms built by the water.¹⁷⁴ Mikimoto came to call shellfish over three years of age “mother oysters” (*bogai*), an older term which, on the pearl culture farm, also referred to their utility as living inputs rather than as one-off catches to be killed and opened.¹⁷⁵ If they survived the nucleus implantation, “mother oysters” would spend the next three or four years in nearby waters. *Ama* divers helped to

¹⁷² Mikimoto Kōkichi, “Shinju monogatari,” *Kokoro no hana* v. 9 no. 5 (May 1905), p. 59.

¹⁷³ Mikimoto Kōkichi, “Shinju monogatari” (March 1905), p. 43.

¹⁷⁴ Mikimoto Kōkichi, “Shinju monogatari” (April 1905), p. 53.

¹⁷⁵ An earlier reference to pearl oysters as “mother oysters” can be found, for example, in a treatise entitled “Methods for Preserving Fishing Villages” and attributed to Satō Nobusue (1724-1784) and Satō Nobuhiro (1769-1850). The essay, part of a published compilation of Nobusue and Nobuhiro’s writings on political economy, was typeset in 1873 with (unspecified) revisions under the purview of two young Meiji officials. One of those officials, Oda Kanshi (1842-1923), would be central to the formation of Japan’s Bureau of Fisheries (*Suisankyoku*). The essay claimed that “pearl mother oysters,” which were “only found in Shima province’s Toba,” had long ago been transplanted to Ōmura Bay and other parts of Japan to form the fisheries there. See *Satō shin’en kagaku zenshū jōkan* (Tokyo: Iwanami shoten, 1926), p. 464.

keep “mother oysters” alive for years in the expectation that they would yield what had been considered astonishingly rare objects—saltwater pearls—in return.

One byproduct of Ago’s growing pearl culture infrastructure was a growing fear of shellfish depredation. “Armies” of pearl oyster-eating creatures like octopus and starfish came to be characterized as enemies worthy of extermination, a situation in some ways similar to what had also occurring around the same time between livestock ranchers in Hokkaido and the canines that came to be dubbed “Japanese wolves.”¹⁷⁶ A series of illustrated “wanted lists” published in the Mie fisheries experimental station’s 1905 report pictured a host of aquatic creatures labeled as economically harmful pearl oyster “pests.”¹⁷⁷ The problem of disease arrived to the waters of Ago Bay as well. In his early years of propagation and pearl culture experimentation, Mikimoto’s Ago Bay pearl oysters had been decimated by the appearance of discolored waters—caused, researchers in Japan were discovering, by the presence of innumerable tiny dinoflagellate creatures. Mikimoto and others in Japan most often called these waters *akashio*, a term that could be rendered into English as “red current,” “red water,” and—especially after the Second World War—as “red tide.” Nowhere in the early twentieth century was it considered an existential threat like in Ago Bay.¹⁷⁸

¹⁷⁶ Battlefield reports of Mikimoto’s octopus wars can be found in articles like “Takogun to tatakau,” *Yomiuri Shinbun*, 16 July 1915. See Brett Walker, *The Lost Wolves of Japan* (Seattle: University of Washington, 2005) and Walker’s “Meiji Modernization, Scientific Agriculture, and the Destruction of Japan’s Hokkaido Wolf,” *Environmental History* 9 (April 2004): 248–274.

¹⁷⁷ *Mie ken shikenjō jigyo seiseki* (1905).

¹⁷⁸ Kjell D. Ericson, “Making Space for Red Tide: Japanese Pearl Cultivation and the Demonization of Discolored Waters,” *Journal of the History of Biology* (submitted).

In January 1905, discolored waters again appeared on the surface of the bay. The situation did not seem especially serious at first; compared with previous outbreaks, the water did not seem to have taken on an especially reddish hue. Nevertheless, the diffuse color stayed for over three months. By the beginning of March, fishers from Shinmei were estimating tens of thousands of pearl oyster deaths along their shores. Mikimoto called in two hundred additional divers, paying them fifty percent more than their usual wage to dive in Ago's winter waters. The only option was to move all remaining oysters to other areas, but the cold prevented the breath-diving *ama* from working for long periods of time. When the waters around his pearl culture farm turned deadly, Mikimoto could call upon the small but well-placed network of zoologists in Tokyo and fisheries officials in Mie Prefecture who had worked with him for well over a decade. In 1905 Mikimoto requested the assistance of Ministry of Agriculture and Commerce fisheries official Nishikawa Tōkichi, one of Mitsukuri Kakichi's protégées at Tokyo Imperial University and a man who had come to Ago Bay during an earlier *akashio* case in 1900.¹⁷⁹ This time, however, Nishikawa could do little more than survey the damage. In all, close to eighty percent of Mikimoto's total stocks would die.¹⁸⁰ Seven hundred thousand implanted "mother oysters" closer to the Island of Abundant Virtue had perished, along with a

¹⁷⁹ The *Tokyo nichinichi shinbun* published a 21 March 1905 report based on the four-day Ago Bay survey Nishikawa had made starting on March 9. As we will see in the following chapter, Nishikawa and Mikimoto's deepening and ultimately contentious relationship—Nishikawa married one of Mikimoto's daughters and was a live-in pearl experimentalist on the island before starting his own laboratory on Hyōgo prefecture's Awaji Island—would come to be seen as a major turning point in the history of pearl culture methods.

¹⁸⁰ "Yōshoku shinjugai no daisangai," *Tokyo nichinichi shinbun*, 21 March 1905; Ototake Iwazō, *Denki Mikimoto Kōkichi* (Tokyo: Kōdansha, 1950) p. 115; "Dreaded Red Current Ruins Japanese Pearl Farms," *St. Louis Post-Dispatch*, 3 Dec. 1905.

million or so smaller shellfish in the waters he had leased from Ugata village. A few hundred thousand pearl oysters survived, but American pearl dealers relayed the news that Mikimoto “admits his inability to furnish supplies for a few years to come in the same quantities as heretofore.”¹⁸¹ A year later in 1906, Mikimoto juxtaposed Japan’s foreign affairs and the marine discolorations that had invaded his culture farm: “It was the middle of the Russo-Japanese War; the nation’s battle was scattering sparks on both land and sea. Yet I was battling with *akashio*. Just as weapons are essential to the national war, the weapon of a business war is money.”¹⁸² In the aftermath of the 1905 discolored water outbreak, Mikimoto entered into agreements to buy thousands more “mother oysters” from Hamajima’s expanding pearl oyster farming grounds.¹⁸³ He also began to eye Ago’s neighboring bay of Gokasho for additional pearl culture sites. “I was never as shocked as I was at that time,” recalled Mikimoto of Ago Bay’s 1905 discolored waters. “If I had left them all in the water, tens of thousands of living shellfish would have all died; I had to evacuate them to a safe place. Had I not helped them at all, *I would have died along with the oysters.*”¹⁸⁴

¹⁸¹ “Dreaded Red Current Ruins Japanese Pearl Farms.”

¹⁸² “Mikimoto Kōkichi kun,” *Kōgyō shoyūken zasshi* (June 1906), quoted in Ototake, *Denki Mikimoto Kōkichi*, p. 116.

¹⁸³ In 1911 Hamajima’s cultivators sold over seven thousand *kan* (just over 26 metric tons) of living pearl oysters to Mikimoto. They would make further contracts throughout the next fifteen years. See *Hamajima gyogyō kyōdō kumiai no ayumi* (1991), pp. 68, 104.

¹⁸⁴ “Mikimoto Kōkichi kun,” *Kōgyō shoyūken zasshi* (June 1906), quoted in Ototake, *Denki Mikimoto Kōkichi*, p. 116. Emphasis mine.

Mikimoto portrayed saltwater itself as a protean villain that engaged him in militarized conflicts. In the balance, as he saw things, were his pearl oysters' lives and his very own economic survival. Defending pearl oysters were *ama* divers at the front lines and zoological surveyors in reserve. In areas of pearl culture, aquatic depredation and disease came to replace human “overharvesting” as the cultivator’s overriding concern. Demarcated gardens, inhabited and tended by molluscan and human mothers of pearl, were still vulnerable to everything trying to swim, float, or crawl their ways in.

The “Culture Pearl”

The pearl oysters that managed to survive in Ago Bay’s waters yielded objects that began to circulate widely. In 1899, just a few months after harvesting his first crop of pearls, Mikimoto opened a retail shop on a side street near Tokyo’s Ginza commercial district. Mikimoto’s younger brother Saitō Shinkichi headed the shop, where he sold pearls and other jewelry items along with Mikimoto’s brother-in-law Kume Takeo.¹⁸⁵ In 1904, Mikimoto sent Saitō, Kume, and a sizable number of his patented hemispherical pearls to the United States for the 1904 St. Louis Louisiana Purchase Exposition.¹⁸⁶ Crowds in St. Louis heard from a range of Japanese spokesmen about the conditions under which Mikimoto’s pearls had been produced along Japan’s coastlines. Among them was zoologist Mitsukuri Kakichi, who had come to St. Louis to give a speech entitled “The

¹⁸⁵ *Mikimoto shinju hatsumei 75 shūnen: 1893-1968* (Mikimoto shinju kaisha, 1968).

¹⁸⁶ *Mikimoto shinju hatsumei 75 shūnen*.

cultivation of marine and fresh-water animals in Japan.” Mitsukuri told listeners—many of them female, as one of his friends later remembered¹⁸⁷—about the thousand-odd acres of seafloor in Mie Prefecture on which Mikimoto had built his farm—an area which, as it happened, was comparable to that of the entire fairgrounds.¹⁸⁸ Mitsukuri took credit for suggesting the term “culture pearl,” the English translation Mikimoto and his emissaries used when selling the company’s hemispherical products to English-speaking buyers. He also positioned himself as the key figure in Mikimoto’s rise as a pearl cultivator:

As in so many other matters in Japan, there was a time after the restoration of 1868 when the fishery for these precious shells was thrown into a chaotic state, and, as is usual in such a case, carried to an excess, so that the yield of pearls dwindled to almost nothing. In 1890 I suggested to a Mr. Mikimoto, a native of Shima, who had grown up and lived in the midst of the pearl-producing district, the desirability of cultivating the pearl oyster. He took up the subject eagerly, and began making experiments on it. Soon after I pointed out to him also the possibility of making the pearl oyster produce pearls by giving artificial stimuli. He at once proceeded to experiment on it. The results have been beyond expectations, and to-day the Mikimoto pearl-oyster farm, put on a commercial basis, has millions of pearl oysters living on its culture-grounds, and is able to place annually a large crop of pearls on the market.¹⁸⁹

As Mitsukuri hinted, “culture pearls” were themselves part of dramatic reforms. These included the market relationships that brought pearls from Ago Bay to overseas buyers. Mikimoto’s idea of what “the market” was had indeed changed from his early years in the marine products trade. “Up till recently all pearls would have been sold to China,” said Mikimoto in 1905. “But for around the past thirty years the good ones have been going to Europe. Today I supply all of them for ornamental use. They have also come to be placed

¹⁸⁷ Takahashi Katashi, “Mitsukuri sensei o tsuisō su,” *Dōbutsugaku zasshi* v. 22 n. 256 (15 Feb. 1910), p. 156.

¹⁸⁸ The St. Louis fairgrounds covered over 1200 acres. Charles M. Kurtz, *The Saint Louis World’s Fair of 1904* (Gottschalk Publishing Company, 1903), p. 20.

¹⁸⁹ Mitsukuri Kakichi, “The Cultivation of Marine and Fresh-Water Animals in Japan,” in *Congress of Arts and Science: Universal Exposition, St. Louis, 1904* (Boston: Houghton, Mifflin, 1906), p. 721.

in Japanese imperial awards. As long as it's shiny and round, it will be used as ornament.”¹⁹⁰

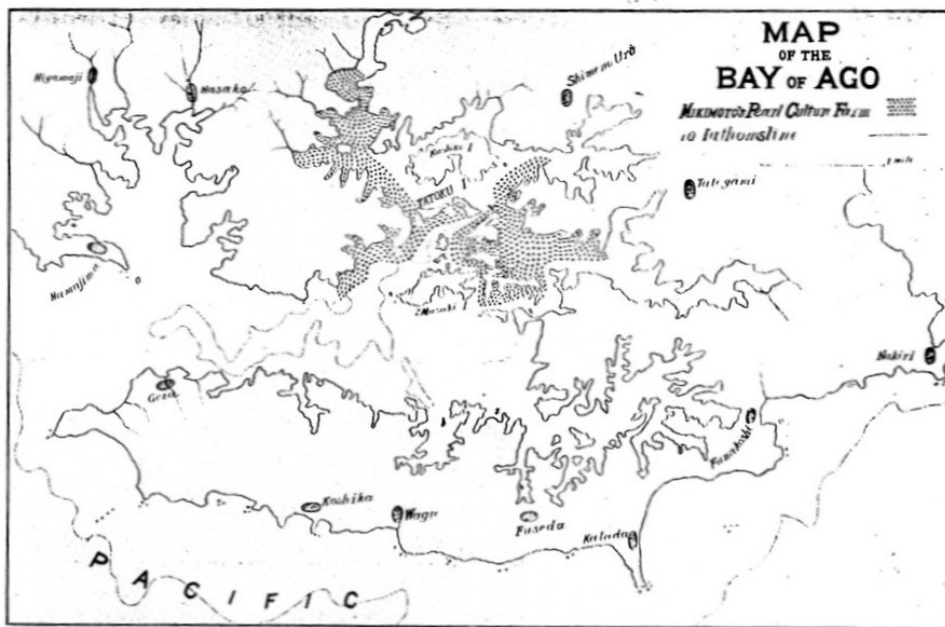
Mikimoto's semi-spherical “culture pearls” found places in brooches, earrings, and cufflinks, not the necklaces that were some of the early twentieth century's most expensive jewelry items. Even so, Mikimoto was in a position where he could be choosy about how he sold them. Patent monopolies and exclusive access to some of Japan's richest pearl oyster fisheries provided initial support to his pearl culture venture by keeping domestic competitors at bay. Mikimoto's rise as a cultivator occurred, moreover, during the boom in prices for “natural” pearls gathered in Ceylon, Venezuela, the north coast of Australia, and the Persian Gulf. Amid strong demand for his more affordable “culture pearls,” Mikimoto made quality control a centerpiece of his early twentieth century sales strategy. “I decided to put no more than twenty percent of the pearls I gathered on the market,” he explained. “What I mean by this is twenty percent of all the pearls that might be sold for three yen or more. As for the one yen, the two yen, or the two-and-a-half yen specimens, I bury all of them in the ground; I won't even try to sell them.”¹⁹¹

After Saitō and Kume moved the shop to a more prominent location along Ginza's main thoroughfare upon their return from St. Louis, company salesmen devoted significant energies toward educating customers about the methods by which “culture pearls” had been produced in the water. Many of the English-speaking shoppers at

¹⁹⁰ Mikimoto Kōkichi, “Shinju monogatari” (April 1905), p. 54.

¹⁹¹ Quoted in Ototake, *Chichi, Mikimoto Kōkichi o kataru*, p. 97.

Mikimoto's Ginza shop received pamphlets illustrating his company's island in Ago Bay, its *ama* divers, and the surrounding ocean spaces in which pearl culture activities took place. And as the extent of Mikimoto's demarcated rights grew, the stippled areas on pamphlets' maps that denoted the extent of Mikimoto's pearl culture farm changed apace. A 1907 edition noted that "the sea-bottom around the island was at first leased, the area being increased from time to time until finally in 1903 and also 1905, the Government recognizing the importance of the enterprise granted the use of a very large portion of the bay, so that at the present day, the whole of the sea area leased by Mikimoto extends for 29 nautical miles."¹⁹²



*"Mikimoto's Pearl Culture Farm," stippled across the northern half of Ago Bay's waters.*¹⁹³

¹⁹² K. Mikimoto, *Japanese Culture Pearls: A Successful Case of Science Applied in Aid of Nature* (Tokyo: Mikimoto Pearl Company, 1907), p. 14.

¹⁹³ K. Mikimoto, *Japanese Culture Pearls: A Successful Case of Science Applied in Aid of Nature*.

The King and the Emperor

By the early twentieth century, Mikimoto had begun to think of himself as something more than a merchant. So, too, had many others throughout Japan. Mikimoto embraced the mantle of “Pearl King” (*Shinjuō*), which by then made frequent appearances in local and national print media.

The language of landed lordship and paternal benevolence suffused Meiji-era talk of Mikimoto and his pearl culture farm. Mikimoto’s island headquarters on the “Island of Abundant Virtue” formed a prominent part of the moral appeals that suffused his enterprise. “It is not big, but Mikimoto has carved this once-uninhabited island into a tiny kingdom,” said the poet Takahama Kyoshi. Fellow Mie resident Sasaki Nobutsuna added that “after looking at the well-ordered society that has taken shape here, I thought to myself that the most enjoyable thing in life might be to try to create an ideal world on such a beautiful island.”¹⁹⁴ Others positioned Mikimoto, “the Sontoku of Ise,” as a successor to early modern Japan’s best-known prophet of local development, Ninomiya Sontoku, and Sontoku’s slogan of *hōtoku*, or “returning virtue.”¹⁹⁵ “Mikimoto is not just a leader; he is a ruler,” wrote the secretary to the Minister of Commerce and Agriculture in *Shimin*, the journal of the revived Meiji *Hōtokukai* society.¹⁹⁶ At times Mikimoto signed his letters as “Kinjirō from south of the Miya River,” appropriating the sobriquet once

¹⁹⁴ “Tatokujima (2),” *Hōchi shinbun*, 26 September 1906.

¹⁹⁵ For a reference to Mikimoto as the “Sontoku of Ise” (*Ise no Sontoku*), see *Mie shinbun*, 4 August 1916.

¹⁹⁶ Kitagawa Yoshihiko, “Kateichū gakkō to tokushi naru shinju yōshoku jigyō,” *Shimin* v. 3 n. 13 (Feb. 1909), p. 48.

used by Sontoku and locating it within Shima's environs.¹⁹⁷ Mikimoto donated trees that lined the road to Ise's grand shrine. Cultivation rights agreements with Ago's coastal villages also included explicit and informal provisions for Mikimoto to fund schools and build roads. "My territory (*ryōbun*) is all of Shima and part of [neighboring] Watarai," said Mikimoto. "I don't step foot north of the Miya River. Those lands have their own people, so I don't like to overstep those boundaries. I don't donate a penny to other places unless it's for public works projects."¹⁹⁸

Supporters (and detractors) saw Mikimoto as a king on his Island of Abundant Virtue and a man of influence in Shima and Ise. But Mikimoto emphasized his place within a modernizing nation-state and an expanding empire. For one thing, Mikimoto's "culture pearls" became objects of Japanese diplomatic relations: Prince Komatsunomiya Akihito, in his capacity as the Meiji state's representative, brought a number of pearls to Paris to have them made into items of jewelry before presenting them to King Edward VII at his 1902 coronation.¹⁹⁹ The role of courtier could also be performed in person. On 16 November 1905, Mikimoto gained an audience with the Meiji emperor. The meeting took place near Ise shrine, where the emperor had made an official excursion from the imperial palace in Tokyo. Mikimoto brought the emperor gifts befitting someone who styled himself as a man who made pearls. The Imperial Household Ministry registered three

¹⁹⁷ Mikimoto used this nickname in a 2 May 1913 letter republished in part in Ototake, *Denki Mikimoto Kōkichi*, p. 96.

¹⁹⁸ "Tatoku yuki (4)," *Ise shinbun*, 11 August 1916, located in MPIMA.

¹⁹⁹ Ototake Iwazō, *Mikimoto Kōkichi* (Tokyo: Baifūkan, 1948), p. 52.

dozen “culture pearls,” in equal numbers the color of silver, lapis, and peaches. Included too were three similarly-hued pearl oyster shells, each with a hemispherical pearl still attached to its inner surface. Two rather more unusual gifts accompanied Mikimoto’s samples of pearl and shell. One was a copy of Mikimoto’s first Japanese patent covering the first step in Mikimoto’s method for inducing pearls in living shellfish. Another was a coastal map showing the extent of Mikimoto’s pearl culture farm in Ago Bay.²⁰⁰

A web of legitimation supported Mikimoto’s role as ruler of Shima’s coastal economy. Imperial patronage and state-authorized rights helped to make Mikimoto into an intermediary between living pearl oysters and the products obtained from them. Mikimoto’s farm was inextricably part of newly instituted legal regimes that, as indicated by his gifts to the emperor, underlay claims both to pearl oyster production and pearl oyster habitats. What a reformed catch-and-gather fishery *and* what a Western-oriented export fishery might look like were two questions to which Mikimoto and the staked-off waters of Ago Bay came to provide an answer. Mikimoto entered Ago Bay as a coastal buyer of China-bound marine products but reemerged as a pearl oyster protector. He became someone who—by way of his employees and his living shellfish—made and sold “culture pearls.” In the first years of the new century, few could say otherwise when Mikimoto announced that “no one can imitate me.”²⁰¹

²⁰⁰ *Gojunkō kiyō* (Mie ken, 1928), pp. 467-470.

²⁰¹ Mikimoto Kōkichi, “Shinju monogatari” (May 1905), p. 59.

Chapter Two

The Life and Times of Patent no. 2670: Industrial Property and Public Knowledge

In the aftermath of the Second World War, a Japanese children's book identified what its author, then a member of Japan's Diet, called "the two inventions that will lift up the homeland."²⁰² The book's cover presented two images, one of an automatic loom and another of a round pearl nestled on the half shell of an opened shellfish. At the time, each of these images served as an easy shorthand for the inventors whose faces did not appear alongside them: the loom maker Toyoda Sakichi (1867-1930), whose son had gone on to head the Toyota automobile company, and the pearl cultivator Mikimoto Kōkichi (1858-1954). Toyoda and Mikimoto's reputations as dual exemplars of national invention, forged earlier in the twentieth century, were bound up with the patents they had controlled. Even so, the contrast between the inventions attributed to each of them is striking. In the background, a manufactured piece of textile machinery of the sort that, in a variety of places, has held a metonymic association with industrialization. In the foreground, a combination of fleshy bivalve and shiny pearl.

Two concerns motivate this chapter: to elucidate how the cultivation of pearls in

²⁰² Toyosawa Toyoo, *Sokoku o okosu hatsumei futatsu: shinju to shinjidō shokki* (Tokyo: Gakushūsha bunko, 1948).

living shellfish first became a linchpin of national narratives of “Japanese” invention and how it entered an industrial property rights regime that created opportunities to reward individual inventors for novel claims of artifice. Clues to these puzzles can be found by taking a closer look at Mikimoto’s first pearl cultivation patent, the 2670th issued by Japan’s patent office upon its approval in 1896, and its relationship to the changing patent system of early twentieth century Japan.

To be sure, the movement of technical publications, apparatus, and skilled practitioners was a prominent feature of Tokugawa and Meiji Japan’s technological landscape.²⁰³ But along with “know-how” came legal mechanisms for authoring it, owning it, and controlling its spread. One of those mechanisms was the patent system. Japan’s late nineteenth century patent system enshrined a legal notion of individual invention in the term *hatsumei* 発明. Throughout the first half of the nineteenth century, *hatsumei* appeared most often in Japan as a way to describe the philological rediscovery of (or quite literally, the shedding of light upon) ancient texts.²⁰⁴ In the late nineteenth century,

²⁰³ See, for example, Thomas C. Smith, “Ōkura Nagatsune and the Technologists,” in *Native Sources of Japanese Industrialization, 1750-1920* (Berkeley: University of California Press, 1988), pp. 173-198; Tessa Morris-Suzuki, *The Technological Transformation of Japan: From the Seventeenth to the Twenty-First Century* (Cambridge University Press, 1994), especially chapter 4 on “Technology and the Meiji State, 1868-1912.” Morris-Suzuki does discuss issues of patenting here and in subsequent chapters, but the thrust of the book’s important argument, akin to Smith’s earlier temporal focus on Tokugawa period authors and promoters of agricultural treatises, is the development of national, prefectural, and local networks for the dissemination of technical information. Alongside a substantial Japanese language bibliography, treatments of the Japanese patent system in English can be found in William Röhl, ed., *History of Law in Japan Since 1868* (Brill, 2005), pp. 402-543; Tomita Tetsuo, “The Origin of the Patent System in Japan,” *Japanese Studies in the History of Science* no. 3 (1964), pp. 114-126; James R. Bartholomew, *The Formation of Science in Japan: Building a Research Tradition* (New Haven: Yale, 1989), p. 132.

²⁰⁴ For the philological role of *hatsumei* (Ch. *faming*) in Qing China, see Benjamin A. Elman, *From Philosophy to Philology: Intellectual and Social Aspects of Change in Late Imperial China* (Harvard University, 1984), p. 207.

hatsumei became an amalgam of what we might now divide between discovery, in the sense of shedding light on heretofore unknown secrets of nature, and invention in the sense of making machines and methods that conformed to, and perhaps even extended, existing understandings of nature. The latter sense of *hatsumei* became part of a way to claim monopoly rights with the implementation of Japan's 1885 Patent Monopoly Act (*senbai tokkyo jōrei*) and the issuance of Japan's first patents. As the act defined it, "Those who invent (*hatsumei shite*) a useful thing and want to monopolize its sale must apply to the Ministry of Agriculture and Commerce for a patent."²⁰⁵

The 1899 revision of Japan's unequal international commercial treaties in turn brought with it new understandings of Japan's role in the international defense of industrial property and copyright.²⁰⁶ What some observers saw as the Japanese state's responsibility to defend (foreign) industrial property and prosecute (domestic) patent infringement was accompanied by a class of homegrown, patent-holding inventors (and copyright-holding authors) with their own internationally-recognized rights to protect.

In once sense, patents existed as published—and, after 1899, translated and internationally circulating—artifacts. Like agricultural and technical treatises that purported (in principle if not always in practice) to disseminate knowledge to all takers, patents defined claims over new machines and methods in print. Unlike other publications, patents also provided to their owners a specified period (fifteen years, for

²⁰⁵ *Genkō hōritsu kisoku ruizen* (Ōdōkan, 1885), p. 214.

²⁰⁶ After 1899, theories of property, including questions related to what we now commonly call "intellectual property" (or, in Japanese, *chiteki zaisan*), received fresh attention across Japan. See Michael Bourdaghs, "Property and Sociological Knowledge: Natsume Sōseki and the Gift of Narrative," *Japan Forum* v. 20 n. 1 (2008): pp. 79-101.

the most part, in early twentieth century Japan) during which those claims might be defended in Japanese courts. It was this late nineteenth century domestic culture of invention and patenting, reshaped by post-1899 international industrial property integration and patent protection, that arose and transformed during the life of Mikimoto's 1896 patent for a step in the production of semi-spherical "culture pearls" inside living shellfish.

One prominent narrative surrounding the introduction of formal patent regimes in Europe and the United States is a transition from arbitrary royal or imperial privileges bestowed upon a chosen few to a bureaucratized system for granting legal rights to all who qualified.²⁰⁷ Yet throughout Japan's early twentieth century, the distinction between the "open" disclosure of technical methods (from which derives the Latinate *patente* of "letters patent") and the whiff of "special monopoly privilege" (one rendition of the Meiji patent office's term for a legal patent right, *senbai tokkyo ken* 専売特許権) was neither clear nor undisputed. Nowhere was this more apparent than with Mikimoto's first patent.

"It is quite possible that nothing caused the patent office more trouble during the Meiji years than pearl issues," wrote one prominent Japanese zoologist in the 1920s.²⁰⁸ Between 1908 and 1915, domestic opponents of Mikimoto's monopoly position brought more than ten suits against patent no. 2670, resulting in dozens of rulings from Japan's

²⁰⁷ Mario Biagioli, "Patent Republic: Representing Invention, Constructing Rights and Authors," *Social Research* v. 73 n. 4 (Winter 2006), pp. 1129-1172.

²⁰⁸ Kawamura Tamiji, "Nihon no shinju," *Kaizō* (December 1927), p. 49.

patent office tribunal and other courts of appeal.²⁰⁹ Records of this struggle survive in an array of sources, including patent office and higher court decisions, legal commentaries, case files, newspapers, and trade journals. Taken together, these accounts reveal an anatomy of Japan's first major patent conflict. They expose a range of often conflicting ideas of technical authorship and monopoly ownership in early twentieth century Japan. They also help to situate its vested parties.

Patents structured would-be Japanese pearl cultivators' access to methods to a degree unmatched in other agricultural, livestock, or fisheries fields of the time. As such, patents stirred up unprecedented controversy. Dispute over Mikimoto's first patent resulted in what later came to be seen as the first Japanese judicial rulings regarding the patentability of manipulations involving living creatures. As a result, the trials of patent no. 2670 brought with them implications for subsequent understandings of biopatenting in Japan. Here I focus upon two related questions of legal demarcation that surrounded the life of patent no. 2670, from Mikimoto's initial application to Japan's patent office in 1894 until the expiration of the patent's claims in 1921. The first question has to do with how patentees, patent examiners, and judges decided what was new, and what was not. What separated novel technical knowledge from known methods in early twentieth century Japan? The second question focuses on the place of pearl oysters in a system of "industrial" property rights. On what grounds could processes that worked through the mediation of a living creature count as industrial (and thus patentable) processes?

²⁰⁹ Kishi dōmonkai, ed. *Ko bengoshi hōgaku hakase Kishi Seiichi soshō kiroku shū, gyōseihen dai 3 gō* (Tokyo: 1935).

The Birth of Patent no. 2670

As we saw in the previous chapter, from the late 1870s the young Mikimoto Kōkichi was, among other things, a buyer and seller of China-bound marine products. These marine products included pearls, which he bought from divers and fishers in his native southern Mie Prefecture region of Shima. But when pearl supplies began to drop in the 1880s, Mikimoto the dryland pearl dealer became Mikimoto the saltwater pearl oyster farmer. Not long thereafter, Mikimoto made a public exhibition of living pearl oysters and their products in an aquarium hall built specially for Japan's 1890 national industrial exposition. There he met with the Johns Hopkins-trained Tokyo Imperial University zoologist Mitsukuri Kakichi and one of Mitsukuri's students, who were both acting as judges of the glass-enclosed menagerie of aquatic creatures that had been put on display. Mitsukuri suggested methods for improving Mikimoto's nascent efforts at propagating pearl oysters. Following the exposition Mikimoto travelled to the University's coastal zoological laboratory south of Yokohama at Misaki, where Mitsukuri and others tutored him on ways to increase his shellfish population and hinted at methods for inducing them to produce pearls on demand. Mikimoto returned to Shima to continue his experiments and applied for a patent in late 1894. He received patent 2670 a little over a year later in January 1896.²¹⁰ Mikimoto's first patent was entitled "a method for causing the deposition

²¹⁰ Mikimoto Kōkichi, "Shinju monogatari," *Kokoro no hana* 9 no. 4 (April 1905), pp. 53-56.

of pearl nacre via human artifice.”²¹¹ It described an “improvement” to a process for crafting semi-spherical objects that would be placed along the inside edge of a living pearl oyster’s shell. If all went well, over the next several years the inserted objects would be covered with nacre (also known as mother-of-pearl) secreted by the shellfish.

Patent no. 2670 spelled out a key step in the production of the semi-spherical “culture pearls” for which Mikimoto would become famous at the turn of the twentieth century. It undergirded his entry into the full-time business of pearl cultivation for buyers not in China but increasingly in Europe and the United States. For over a decade, Mikimoto’s patents (patent no. 2670 and a subsequent one issued in 1902) remained the only exclusive rights related to pearl cultivation in Japan or, for that matter, anywhere else in the world.²¹²

The Origins of Dispute

One strand of domestic dispute over patent no. 2670 can be traced to March 1908, when Mikimoto brought patent infringement charges against three nearby marine entrepreneurs whom Mikimoto claimed had made illegal use of his method.²¹³ Police in

²¹¹ “*Jinkō shinju soshitsu hichakuhō*” (人工真珠素質被着法), Japanese patent no. 2670 (1896). Accessed via Industrial Property Digital Library (IPDL) www.ipdl.inpit.go.jp/.

²¹² For a partial list of pearl-related patents in English, see Alvin R. Cahn, *Pearl Culture in Japan* (Tokyo: General Headquarters Natural Resources Section, 1949).

²¹³ At the time, patent infringement was a criminal offense that carried a penalty of up to three years’ imprisonment. Infringement covered the unlawful imitation of someone else’s patented product or method, as well as the conscious use or sale of the imitated product or method. A number of European and American countries, including Argentina, Chile, Mexico, Guatemala, Portugal, Switzerland, Uruguay, and Venezuela, also treated infringement as a matter of criminal law as of 1905. See W. P. Thompson, *Handbook of Patent Law of All Countries*, 13th ed. (London: Stevens and Sons, 1905).

Mie Prefecture promptly arrested the trio, which consisted of the merchant Nagatsuka Shichirō, his associate and nephew Kitamura Jūkichi, and Jūkichi's elder brother Kitamura Kōichirō.²¹⁴

Nagatsuka and the Kitamura brothers wasted little time in countering Mikimoto's criminal patent infringement charges. Within two months of their arrests, the trio joined forces with the Tokyo-based legal practitioner Matsumoto Takashi and brought two suits to the Japanese patent office. They claimed that even though Mikimoto owned a patent over an "improved" process, an older method on which patent no. 2670 was based consisted entirely of publicly available information. They said that they had only followed the older method. The trio asked the patent office to evaluate the patent's novelty, arguing that Mikimoto's "improved" method did not differ substantially from already-published ones.²¹⁵

Each side in the dispute had a different story about how this flurry of litigation had come to pass. "The cornered rats are trying to bite the cat," said Mikimoto's legal counsel Kishi Seiichi. Kishi claimed that the trio had attacked Mikimoto because they were scrambling to avoid the pending criminal charge of patent infringement.²¹⁶ By contrast, the trio's counsel Matsumoto suggested that Mikimoto had never pressed infringement charges against them in the past, precisely because Mikimoto "had feared a patent invalidation suit" of the very same sort the trio had presently launched. What, then, had

²¹⁴ *Ise shinbun* (19 March 1908).

²¹⁵ Kishi dōmonkai, ed. *Ko bengoshi hōgaku hakase Kishi Seiichi soshō kiroku shū* (1935).

²¹⁶ Kishi dōmonkai, ed. *Ko bengoshi hōgaku hakase Kishi Seiichi soshō kiroku shū*, p. 26.

changed? For one thing, the trio saw the makings of a fisheries rights grab around their pearl farms in Gokasho Bay, the inlet next door to Mikimoto's increasingly well known headquarters in Ago Bay. The trio's legal counsel suggested that Mikimoto coveted exclusive cultivation rights to the seafloor around their coastal plots and had decided to use patent infringement as a pretext to gain control of them.²¹⁷

The Making of a Japanese Public Domain

Well before patent 2670 first went to a patent tribunal in April 1908, legal practitioners inside and outside the patent office had been wrestling with the meaning of *kōchi kōyō* 知公用, a term derived from a clause of Japan's patent law that referred to processes and apparatus that were "publicly known and publicly used"—and thus, no longer patentable. Legal practitioners understood this term as a shorthand for two kinds of wider familiarity with technical information: "knowledge" that came from published sources, including earlier patents, and the practical "use" of machines and methods irrespective of textual circulation. *Kōchi kōyō* was, in effect, a public domain of accessible (or already accessed) know-how of the sort that Anglo-American law would have termed "prior art."²¹⁸

At the turn of the twentieth century, changes in Japan's international treaty structure propelled *kōchi kōyō* to the center of domestic patent debate. The 1899 ratification of revisions to the mid-nineteenth century's unequal treaties brought with it

²¹⁷ Kishi dōmonkai, ed. *Ko bengoshi hōgaku hakase Kishi Seiichi soshō kiroku shū*, p. 41.

²¹⁸ Takeuchi Kakuji, "Tokkyo seraru beki hatsumei no yōken o ronzu," *Hōritsu shinbun* n. 879 (25 July 1913), pp. 27-28, and n. 886 (25 August 1913), pp. 178-180.

bilateral industrial property agreements and the stipulation of Japan's incorporation into the Paris and Berne international conventions for patent, copyright, trademark, and design protection. For the first time, foreigners could apply for patent protection in Japan (via Japanese patent agents). For the first time too, disputes could be appealed to Japan's highest court, the *Daishin'in*.²¹⁹

Patent integration occurred alongside new questions about how far the geographic scope of novelty would extend under Japanese law. Foreign business interests—and the Japanese legal practitioners who represented them—expressed concern that some Japanese patentees under the pre-1899 patent regime had been able to receive patents for claims which seemed to duplicate machines and methods that had been previously published or even patented abroad. This issue reached provisional resolution in the years after 1903, when a controversial ruling by the high civil court asserted that technical knowledge was “unknown” unless published evidence or active practitioners could be located *within the Japanese empire*.²²⁰ Only when knowledge and practice reached Japan's shores would it fall under the rubric of “public knowledge and public use.” In other words, Japanese courts ruled that the empire's public domain was a *Japanese* public domain, not a global one.²²¹

²¹⁹ *Kōgyō shoyūken seido hyakunenshi* vol. 1 (Tokyo: Hatsume Kyōkai, 1985).

²²⁰ Hanaoka Toshio, *Kosodewata seizōki tokkyo mukō shinketsu fufuku jōkoku jiken hyōron* (Tokyo: Yūhikaku, 1903). The 1903 ruling centered around a carding machine patented in Japan in 1892 (patent no. 1601), but which was claimed to have been based on a machine already patented in Britain in the early 1870s. Some Japanese legal practitioners who dealt with international clients, including the legal practitioner Hanaoka Toshio, inveighed against the decision, which in practice had the potential to make it harder for foreign businesses to bring charges against Japanese patent holders.

²²¹ The precedent was officially incorporated into patent office examination procedure in 1909. See *Kōgyō shoyūken seido hyakunenshi* vol. 1.

The redefinition of Japan's public domain following patent integration also gave new resonance to the domestic title of "Japanese inventor."²²² Ensuring compliance with the terms of industrial property rights agreements underlay the formation of the Japanese Society for the Protection of Industrial Property in 1905. Officials affiliated with this institution leveled criticisms against domestic entrepreneurs who, they claimed, did not abide by the rules of Japan's patent system. Soon renamed the Imperial Invention Promotion Society, the association broadened its purview beyond the suppression of patent piracy to the cultivation of wider participation in Japan's industrial property rights regime. Publications provided step-by-step instructions for anyone looking to have their machines or methods patented. Hagiographical anecdotes of Japan's great inventors appeared in newspapers, magazines, and monograph compilations. Icons of invention began to appear in the patent office's on-site patent museum and in regional and national "patented product" (*tokkyohin*) exhibitions. Mikimoto and his "culture pearls" featured prominently in print and on display.²²³

The "Ancient Method" and the Prehistory of Patent no. 2670

Judicial interpretations of a Japanese public domain shaped strategies in the subsequent lawsuits against Mikimoto's patent. During the patent suits, Mikimoto's competitors claimed that a method for inducing shellfish to produce semi-spherical pearls had already

²²² For a different trajectory of "national" inventors in the nineteenth century see Christine MacLeod, *Heroes of Invention: Technology, Liberalism, and British Identity, 1750-1914* (Cambridge, 2008).

²²³ Hatsumeihin hakurankai zammū torishimari jimusho, *Hatsumei hakurankai hōkoku* (1909), p. 87.

been common knowledge in the Japanese empire prior well before Mikimoto's well-publicized 1890 meetings with the Tokyo Imperial University zoologist Mitsukuri Kakichi and other Japanese fisheries boosters.

As the trio's legal counsel Matsumoto Takashi argued, if pearl culture had a place of origin, it was surely in China. In 1908 and 1912, Matsumoto made two separate requests for over a dozen monographs and articles to be used as evidence in the trio's patent office suits. He referred to a number of 1880s Japanese journals and fisheries studies that pointed to a longstanding "Chinese method" of pearl culture.²²⁴ These sources all had links to mid-nineteenth century descriptions of freshwater pearl cultivation in southern China.²²⁵

In 1853, the Ningbo-based American missionary doctor Daniel Jerome MacGowan and the local British Consul Patrick Hague each delivered reports compiled from accounts delivered to them by "an intelligent native" whom they had dispatched to survey several villages. Both reports introduced a supposedly hundreds-year-old method for inducing freshwater mussels to yield shells studded with semi-spherical "artificial pearls"

²²⁴ Kishi dōmonkai, ed. *Ko bengoshi hōgaku hakase Kishi Seiichi soshō kiroku shū*, pp. 3-8, 373-376.

²²⁵ Although it did not come up in the trial, the Swedish polymath Linnaeus (Karl Linné) had learned of a similar method over a century earlier from a fellow countryman who had traveled in China. The Swedish king granted Linnaeus a royal monopoly for his method in 1761. Shortly thereafter he sold the process to another Swedish entrepreneur, who appears to have made no further use of it. However, Linnaeus's freshwater pearl experiments received renewed attention from the London Linnean Society in the early twentieth century. See Lisbeth Koerner, *Linnaeus: Nature and Nation* (Cambridge, MA: Harvard, 1999), particularly the chapter "'The Lord of All of Sweden's Clams': A Local Life," as well as British zoologist W. A. Herdman's "Presidential Address, 1905," *Proceedings of the Linnean Society of London, 117th Session* (London, 1905), pp. 18-30.

or mother-of-pearl-coated icons of the Buddha.²²⁶ Throughout the nineteenth century, “Buddha shells” found their way into museums and private collectors’ cabinets across Europe (Figures 1 and 2). The rapid European circulation and translation of reports on southern Chinese pearl culture and the up-close examination of “Buddha shell” specimens spurred research into the origins and physiological mechanisms of pearl formation in freshwater shellfish, particularly among German experimentalists.²²⁷

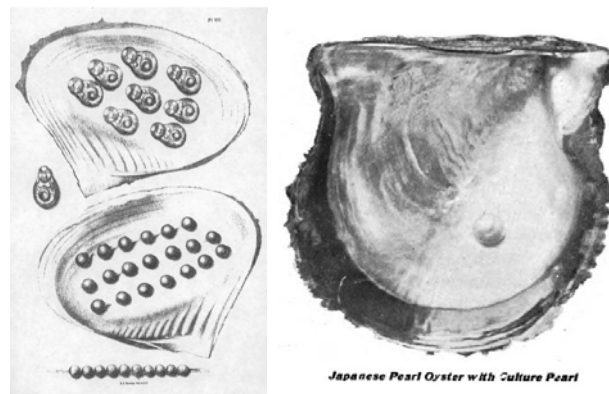


Figure 1 (left). A “Buddha shell” and semi-spherical pearl shell collected in southern China.²²⁸
 Figure 2 (right). Mikimoto’s “Japanese Pearl Oyster with Culture Pearl.”²²⁹

In Japanese patent office tribunals, the trio’s counsel Matsumoto pointed to published transcripts of fisheries lectures given to audiences in Tokyo, Shizuoka, and elsewhere in Japan. German-language publications of the MacGowan and Hague accounts

²²⁶ D. T. (sic) MacGowan, “Pearls and Pearl-Making in China.” *Journal of the Society of Arts* 2 (Nov. 1853–Nov. 1854), pp. 72–75; F. Hague, “On the Natural and Artificial Production of Pearls in China,” *Journal of the Royal Asiatic Society of Great Britain and Ireland* 16 (1856), pp. 280–284.

²²⁷ Karl Möbius, *Die echten Perlen, ein Beitrag zur Luxus-, Handels- und Naturgeschichte derselben*. Abhandlungen des naturwissenschaftlichen Vereins in Hamburg 4 (Hamburg: Meissner, 1857).

²²⁸ F. Hague, “On the Natural and Artificial Production of Pearls in China” (1856).

²²⁹ From K. Mikimoto, *Japanese Culture Pearls: A Successful Case of Science Applied in Aid of Nature* (1907).

and other offshoots had spread widely among Japanese fisheries boosters, particularly after the 1880 international fisheries exposition held in Berlin.²³⁰ According to Mikimoto's competitors, these publications provided a mechanism of textual circulation whereby zoologists like Mitsukuri Kakichi had seen the potential for extending methods of Chinese freshwater pearl cultivation to locally abundant varieties of saltwater shellfish.

This textual evidence did not sway the patent office to rule against Mikimoto. To the trio's dismay, patent office tribunals and the civil section of Japan's highest court refused to allow outside publications to be used as evidence in the first round of patent invalidation suits. The patent office ruled that it was not possible to prove that all the publications had circulated within the Japanese empire before Mikimoto's patent application. As for books and articles that had clearly been in Japan before Mikimoto's application, the patent office stated that they described something other than the specific improvements described in Mikimoto's patent claims, and were thus inadmissible. Matsumoto's second request in 1912 remedied the previous list by including only texts published prior to Mikimoto's patent application in 1894.²³¹ However, the Patent Tribunal ruled that the new set of articles described something other than Mikimoto's patented method.

²³⁰ An engraved image of such shells appears in *Kaisanron* 海産論, an 1881 translation of a German fisheries monograph undertaken by the *Kaitakushi*, the agency charged with the development of Hokkaidō.

²³¹ Kishi dōmonkai, ed. *Ko bengoshi hōgaku hakase Kishi Seiichi soshō kiroku shū*, pp. 373-376. The texts included the English-language entry for "Pearl" in the *Encyclopedia Britannica* (London, 1889 ed.), pp. 446-448.

Witnessing the State of Pearl Culture's Art

Patent no. 2670 listed two claims that constituted an improvement upon an “ancient method.” As the trials progressed, the novelty of the patent’s claimed improvements came under scrutiny alongside the publication history of earlier pearl culture reports.

Determining the state of pearl culture’s art raised the legal significance of expert testimony.²³²

The patent’s first claim was that spheres of glass, shell, or other material would receive a “partial cut” in order to keep them from rolling on the slick inside of a pearl oyster’s shell. Mikimoto’s counsel argued that the patented “partial cut” also covered the roughly hemispherical objects that Nagatsuka and the Kitamura brothers had inserted along the inner edge of a living pearl oyster’s shell, thus constituting an infringement on patent no. 2670. The hemispheroid nucleus was a seemingly simple object. Nevertheless, comparing the identity of a “partially cut” sphere to what was specified in other published accounts and what was used in practice was of prime importance in the trials over patent no. 2670. Was the “partially cut” nucleus something other than the more-or-less hemispherical objects described in earlier publications?

The trio’s legal representative indicated that at least two dealers, one in Osaka and one in Kyoto, had supplied Mikimoto with the shell and glass beads that Mikimoto had subsequently used in his earliest cultivation experiments. One of them was a Kyoto-based

²³² For a perspective on scientific testimony in the context of Anglo-American law, see Tal Golan, *Laws of Men and Laws of Nature: The History of Scientific Expert Testimony in England and America* (Cambridge, MA: Harvard University Press, 2004).

dealer named Matsuzawa Fukunosuke, who had employed numerous craftsmen to make glass beads for Mikimoto in 1893. The trio's counsel implied that the technique must therefore have been common knowledge, at least among Matsuzawa's employees, months before Mikimoto's September 1894 patent application. To top it off, Matsuzawa himself stated that he had learned "via the newspapers" that the beads could be used in pearl cultivation.²³³

The patent's second claim was that the "partially cut" spheres would then be polished with table salt or soaked in a brine solution before being placed along the inner surface of a living pearl oyster's shell. The trio expressed skepticism about the benefits of adding salt or brine to an object that would, soon enough, be re-submerged into saltwater along with its sea-dwelling host shellfish. Did the salt step serve any specific purpose? The trio's legal representative Matsumoto called for three fisheries officials to submit reports about the salt step's efficacy; Mikimoto's legal representative Kishi Seiichi tapped three others. One of Kishi's chosen experts, the agricultural scientist Sasaki Chūjirō, had surveyed Mikimoto's early pearl cultivation activities over fifteen years prior to the trials. Of the six opinions, only Sasaki's affirmed that the salt step offered a tangible benefit of increased rates of pearly material secretion. As Sasaki put it, rubbing salt in an oyster was "analogous to the increased production of saliva when a person eats something sour."²³⁴ Unconvinced, the trio called for an experiment to determine whether or not salt might in fact speed up the deposition of pearly material. But Mikimoto's representative Kishi

²³³ Kishi dōmonkai, ed. *Ko bengoshi hōgaku hakase Kishi Seiichi soshō kiroku shū*, p. 77.

²³⁴ Kishi dōmonkai, ed. *Ko bengoshi hōgaku hakase Kishi Seiichi soshō kiroku shū*, p. 96.

Seiichi immediately objected to the proposed test. Kishi argued that Mikimoto's demonstrated results trumped any attempts to discredit them experimentally: "In order for a new method to qualify as an invention, there is no need for a scientific explanation of its effects."²³⁵ In so doing, Kishi articulated a defense of the whole patent, not necessarily the viability of its component claims. Mikimoto had received his patent with the salt step claim. If pearl culture worked for Mikimoto using the salt step, would a subsequent test to see whether the absence of the salt step made any appreciable difference invalidate the patent office's basis for granting the initial approval? Kishi argued no.

Through the first months of 1912, the patent office's rulings consistently accepted Kishi's arguments, dismissing the appeals to public knowledge and public use that had been brought to bear against Mikimoto's patent. Tribunals and higher courts affirmed that Mikimoto's patent represented something distinct from any other known methods.

Laws of Nature and Laws of Industry

The novelty of Mikimoto's method was not the only issue in suits brought against his first patent. Debate arose over the question of whether a method that relied on shellfish could itself be patented under Japanese law.

Japan's early twentieth century patent office was one of the world's few patent-issuing bodies to examine every application it received.²³⁶ One of its criteria was the

²³⁵ Kishi dōmonkai, ed. *Ko bengoshi hōgaku hakase Kishi Seiichi soshō kiroku shū*, p. 159.

²³⁶ Patent office examination procedures found a new place in head patent official Takahashi Korekiyo's American-inspired 1889 overhaul of Japan's 1885 patent law.

“industrial” utility of a proposed machine or method.²³⁷ But as it stood in the early twentieth century, the Japanese patent office did not have a formal position regarding the patentability of processes involving living plants, animals, or microorganisms. In 1892, the agricultural chemist Takamine Jōkichi had received a Japanese patent for an improved method to produce the *tane-kōji* mold starter cultures used in the brewing of *sake* and other grain alcohols.²³⁸ Two months after the trio’s counsel unveiled its arguments against Mikimoto, however, the patent office denied a different patent request for a chicken breeding improvement, ruling that “methods of raising chickens and the like are not industrial processes.”²³⁹

The trio’s legal representative Matsumoto questioned the place of human agency in pearl production. Who, or what, “made” a pearl? Matsumoto argued that pearl production depended first and foremost on living pearl oysters, not on human handiwork. He suggested that Mikimoto’s “method for causing the deposition of pearl nacre via human artifice” was a misnomer. A living pearl oyster would be expected to continue secreting mother-of-pearl, human manipulation or not. In any event, Matsumoto noted that aside from the patent’s title, which implied an active (and

²³⁷ This was, in fact, written into the very first clause of the 1899 patent law to put Japan in line with the Paris convention. Hōten kenkyūkai ed., *Nihon roppō* (Tokyo, 1899), p. 228.

²³⁸ Japanese patent no. 1748. At the same time as the Nagatsuka/Kitamura trials, Takamine Jōkichi’s patent for the isolation of the hormone adrenalin was prompting a landmark U.S. court ruling over the patentability of “natural products” that has informed subsequent debate over the United States’ so-called “product of nature” doctrine. See Christopher Beauchamp, “Patenting Nature: A Problem of History,” *Stanford Technology Law Review* 16 no. 2 (Winter 2013), pp. 257-312.

²³⁹ *Meiji 41 nen Tokkyōkyoku shinketsuroku* (Tokyo: Tokkyōkyoku, March 1909), p. 87-88.

patentable) human role in the inducement of mother-of-pearl deposition, the patent's *written* claims did not explicitly cover the moment when someone actually inserted the semi-spherical nucleating object inside a shellfish. In any event, Matsumoto pointed out that, at the time, no Japanese patent had ever been issued for the farming of two of Japan's other major aquacultural products, edible oysters and salmon. Matsumoto suggested that like salmon and edible oyster cultivation methods, Mikimoto's pearl cultivation process was not "industrial" in the slightest.²⁴⁰

In response, Mikimoto's counsel Kishi Seiichi harkened to the fields of brewing and fermentation. Kishi insisted that if Mikimoto's pearl culture patent were invalidated because it made use of so-called "natural laws" (*shizen no hōsoku* 自然の法則), so too should patents for the brewing of alcohol or soy sauce.²⁴¹ Kishi used an analogy: just as brewers added grains and fruit to yeast and *kōji* in order to produce alcoholic beverages, Mikimoto's technicians implanted objects into living shellfish in order to produce culture pearls. As Kishi claimed, "Both make use of artifice in order to aid nature's powers. It therefore goes without saying that both are industrial processes."²⁴²

Things were not as cut and dried as Mikimoto's legal counsel Kishi made them out to be. In fact, the wording of the two claims that constituted patent no. 2670 mentioned only the processing of the semi-spherical nucleating objects. That is to say, they only

²⁴⁰ Kishi dōmonkai, ed. *Ko bengoshi hōgaku hakase Kishi Seiichi soshō kiroku shū*, p. 16-18. It should be noted as well that early twentieth century Japanese sericulturists do not appear to have patented methods of silkworm raising either.

²⁴¹ Kishi dōmonkai, ed. *Ko bengoshi hōgaku hakase Kishi Seiichi soshō kiroku shū*, p. 22.

²⁴² Kishi dōmonkai, ed. *Ko bengoshi hōgaku hakase Kishi Seiichi soshō kiroku shū*, p. 136.

referred to lopping off a portion of a spherical object and then dipping it in salt or brine. Not a word concerning pearl oyster physiology, or the means by which the surgical procedure would take place in practice, appeared in the body of the patent's text itself. In spite of this, Mikimoto's counsel Kishi steered legal debate toward broader questions of the patentability of human interventions in natural processes, in particular where such processes involved living creatures. Intentionally or not, Kishi echoed the earlier words of Prince Komatsunomiya Akihito and the company's own publicity materials, which described the company's pearls to prospective foreign buyers as "A Successful Case of Science Applied in Aid of Nature."²⁴³

In this case, the patent office sided with Mikimoto's counsel Kishi—himself a highly placed official in the Imperial Invention Society—and extended their reading of the patent's scope to the surgical manipulation of pearl oysters themselves. To top it off, Japan's highest civil court concurred. The court's ruling stated that it was clear that the process "makes use of natural side effects through human artifice."²⁴⁴ Courts affirmed that Mikimoto's patent covered not just human interventions, but also the commingling of artifice with the "laws of nature."

Anti-Patent Office, Anti-Mikimoto, Pro-Patent

Ongoing dispute over patent no. 2670 dovetailed with other cultivators' attempts to

²⁴³ K. Mikimoto, *Japanese Culture Pearls: A Successful Case of Science Applied in Aid of Nature* (Tokyo: Mikimoto Pearl Company, 1907).

²⁴⁴ Kishi dōmonkai, ed. *Ko bengoshi hōgaku hakase Kishi Seiichi soshō kiroku shū*, p. 217.

patent additional methods of pearl oyster manipulation. Courts ruled time and again that novel methods of pearl culture fell within the bounds of patentable industrial activity in Japan. But who else could receive those patents?

Two men—one from a neighboring bay, the other Mikimoto's own son-in-law—tried to patent methods of their own. The first, a man named Mise Tatsuhei, applied to the patent office for a process of spherical pearl formation in May 1907. Not long after, Mikimoto's own son-in-law, the zoologist Nishikawa Tōkichi, submitted a similar application. Both had proposed methods to induce the formation of *spherical* pearls via processes that differed significantly from the *semi-spherical* pearl culture method described in Mikimoto's initial patent specification.²⁴⁵

The controlled cultivation of spherical pearls, which could be strung into pearl necklaces that at the time could fetch tens or even hundreds of thousands of dollars in the United States and elsewhere, represented a serious challenge to Mikimoto's established business. It was a dream shared along coastlines throughout the early twentieth century world. In Europe and its colonies, zoologists were in agreement that both pearl and shell alike came from a common source: secretions from a shellfish's soft outer tissues. And just as zoologists described the shell as a pearl oyster's defense against swimming and crawling predators in the surrounding water, they came to see pearls as a byproduct of internal defensive measures against tiny larval parasites, eggs, and other biota that tried to get inside. Armed with pathological understandings of pearl formation

²⁴⁵ *Mise Tatsuhei shuki* (1923), unpaginated manuscript copy, held in the Mie Prefecture Historical Archives (MHA).

but in vocal disagreement about its mechanisms in the water, zoologists and entrepreneurs in the French and British empires began to look toward the warmer coasts of more southerly colonies, where potentially far more lucrative saltwater pearl oysters tended to live.²⁴⁶ Nishikawa and Mise's patent applications were in step with these findings.²⁴⁷ Both proposed methods by which technicians would implant spherical objects *inside* the soft body of a shellfish, not along its shell. In the method of semi-spherical pearl production described by patent no. 2670, cultivators expected that a pearl oyster's shell-secreting outer mantle tissue would deposit mother-of-pearl directly atop any nucleus placed along the inner shell. By contrast, the spherical pearl methods required the step of grafting tissues from the exterior of the same oyster or from another recently killed oyster. These steps were designed to create a "pearl sac" around the nucleus.

Like Nagatsuka and the Kitamuras, Mise Tatsuhei and Nishikawa Tōkichi had both done experiments on pearl oysters in Mie Prefecture. The pair would go on to establish a network of fisheries and cultivators that stretched across the archipelago. After falling out with his father-in-law Mikimoto, Nishikawa continued to develop a method at his alma mater, Tokyo's Imperial University, and at his own farm in the Seto Inland Sea. Mise became a technical advisor at the Ōmura Bay Pearl Company, a pearl cultivation startup in Nagasaki Prefecture. However, the patent office put both applications on hold, citing overlaps in their claims. In the meantime, Mikimoto received a patent in 1908 for a

²⁴⁶ H. Lyster Jameson, "Studies on Pearl-Oysters and Pearls," *Proceedings of the Zoological Society of London* (June 1912), pp. 260-358.

²⁴⁷ Zoologist Kawamura Tamiji, who edited Nishikawa's posthumous research papers for publication in 1914, would later suggest that Jameson's publications had informed Nishikawa's line of experimentation. See Kawamura Tamiji, "Nihon no shinju," *Kaizō* (December 1927).

method that, while neglecting to mention the “pearl sac,” was intended to produce in spherical pearls. Seeking to consolidate their claims and speed up patent approval, Mise and Nishikawa reached an agreement over their conflicting patent applications in 1908. Under the terms of their agreement, Nishikawa would gain sole title to the patent. Mise would obtain full rights to make use of the method—assuming, that is, that the patent office approved the patent. Yet even after stomach cancer took the thirty-four-year-old Nishikawa’s life in 1909, the combined patent application remained in limbo.²⁴⁸

In contrast, patent no. 2670 gained a new lease on life when the Japanese patent office announced that it had granted Mikimoto’s patent a ten-year extension, the first one ever authorized under a recent provision to the patent law.²⁴⁹ Mise and other pearl cultivators across Japan agitated against the extension, which had come only months before the patent’s scheduled expiration. Rumors circulated of favoritism and corruption. Mise Tatsuhei and others began to suspect that delays in the approval of competing patent applications was part of an institutional effort to protect Mikimoto’s patent monopoly.²⁵⁰ Trade publications appealed for fairer allocations of inventive credit, along the lines of what Graeme Gooday and Stathis Arapostathis have termed the “moral economy of invention.”²⁵¹ The *Japan Watchseller and Watchmaker’s Journal* summed up

²⁴⁸ *Mise Tatsuhei shuki* (1923), MHA.

²⁴⁹ Mikimoto took out several newspaper advertisements to announce the extension. See, for example, *Asahi shinbun*, 13 May 1911, and *Yomiuri shinbun*, 14 May 1911. Contemporaneous Mikimoto inventor biographies also gave a prominent place to the extension. See the Imperial Invention Promotion Society’s publication *Gendai hatsumeika den* (Tokyo: Teikoku Hatsumeikai, 1911), p. 100.

²⁵⁰ *Mise Tatsuhei shuki* (1923), MHA.

²⁵¹ Stathis Arapostathis and Graeme Gooday, *Patently Contestable: Electrical Technologies and Inventor Identities on Trial in Britain* (Cambridge, MA: MIT 2013).

the situation in 1911:

The recent rise in the price of pearls has grabbed our average countryman's attention. There are a great many artificial pearl inventions. Word is that patent applicants continue to appear. But we have still not heard of the patent office granting a patent to anyone besides Mr. Mikimoto. The reason for this is said to be that the the new applicants' methods overlap with Mikimoto's. From our perspective, the above-mentioned patented process is nothing more than an appropriated ancient method. In no way is it a superlative invention. The patent office has granted a patent only to a single individual. It has protected an unsophisticated method and stifled the development of this industry, which is truly a disgrace.²⁵²

Cultivator dissatisfaction with the patent system at times even bubbled over into violence. In one widely-reported case, a rejected pearl patent sparked cultivator Kinoshita Yasujirō's decision to hurl a chair at Kawasaki Saijirō, then director of the patent office in late 1915. Kinoshita had made his way to the capital from Mie Prefecture in order to check on a seven-year-old pending patent application in person. He became upset upon hearing that officials had made no effort to inform him of his application's rejection over a month earlier. By all accounts his irritation had turned to rage when Kawasaki retorted that "it is the height of insolence for someone in the position of a supplicant to face off against the director."²⁵³ It was, as one article noted, a "most unusual occurrence."²⁵⁴ True enough, but it was also part of an established pattern of patent-related criticism, fueled by pearl cultivators' perceptions of unequally distributed patent rights.

As early as 1912, the Ōmura Bay Pearl Company and other cultivators, including the chair-wielding Kinoshita Yasujirō, launched their own suits challenging the scope and

²⁵² "Shinju no kaisetsu," *Nihon tokei shōkōshi* (Tokyo: Kinseki tokei shōhōsha, 1911), p. 211.

²⁵³ *Jiji shinpō*, 9 September 1915.

²⁵⁴ *Yomiuri shinbun*, 3 October 1915.

validity of patent no. 2670.²⁵⁵ The specter of a never-ending Mikimoto patent brought the trio's demands for access to publicly known semi-spherical cultivation methods into conversation with wider efforts to persuade the patent office to approve new spherical pearl patents. Resistance to Mikimoto's patent monopoly, in other words, did not mean resistance to pearl culture patents *in toto*.

From Patent Holder to Patent Holders

Mikimoto himself never commented publicly on the ongoing dispute over patent no. 2670 or the new round of spherical pearl patent applications. He did, however, proclaim himself as the prime candidate to farm round pearls two months after the July 1912 passing of the Meiji emperor Mutsuhito. A memorial published under Mikimoto's name in the journal *Shimin* recalled his 1905 meeting with the emperor near Ise shrine. The memorial linked Mikimoto's personal imperial connections to the project of cultivating spherical pearls by mentioning that he had donated a select number of round pearls to the emperor in 1908. "[Round pearls] are not yet ready to be put on the market as products for sale, but I have plans to cultivate more and more of them," read the memorial. "Together with scientists (*gakusha*) I plan to pour all my energies toward the advancement of research. If it takes off, I will make a great many spherical pearls that can be exported widely, even overseas, as an imperial Japanese product (*teikoku kokusan*)."²⁵⁶ Out of court, Mikimoto sidestepped thorny questions of patent priority by claiming

²⁵⁵ Kishi dōmonkai, ed. *Ko bengoshi hōgaku hakase Kishi Seiichi soshō kiroku shū*.

²⁵⁶ Mikimoto Kōkichi, "Sentei no ōmigokoro ni soitatematsuran to no negai," *Shimin* v. 7 n. 7 (September 1912), p. 84.

priority of imperial favor. At the same time, he pushed the date of the new method's practical, large-scale fruition farther into the future. In so doing, he implied that continued support would make the cultivation of an exportable imperial Japanese product possible.

Mikimoto in fact *never* lost any of the many patent tribunal and civil court challenges to his first patent. Rulings stated over and over that processes involving living pearl oysters were subject to protection by “industrial” property rights. What Mikimoto did lose was his criminal patent infringement case against his trio of competitors. This reversal came about when *criminal* courts decided to accept published evidence of “publicly known” cultivation methods—precisely the materials that had been ruled inadmissible in the *civil* trials. In June 1912, the Nagoya regional appeals court overturned an earlier criminal infringement conviction that had been handed down to Nagatsuka and the Kitamuras by a Mie Prefecture district court—though not before the trio had served several months in jail. The Japanese high court's criminal division upheld the appeal ruling and threw out the infringement case against the trio in November. The high court noted that it was “clear based on the court's gathered evidence and evidence submitted by the lawyers” that a method for the cultivation of artificial pearls had been publicly known and publicly used prior to Mikimoto's patent. In its ruling the court claimed it was not bound by earlier patent office decisions. In any case, it suggested a fundamental flaw in previous opinions, noting that “one must always look beyond the scope of a patent

right in order to determine what parts of it are publicly known and publicly used.”²⁵⁷

The weakened position of patent no. 2670 was on full display when Mikimoto and two Japanese competitors exhibited pearls at San Francisco’s 1915 Panama-Pacific International Exposition. One of those competitors, the Ōmura Bay Pearl Company, noted its own “painstaking application and investigation as to the improvement of the old Chinese method of pearl culture.”²⁵⁸ In December that same year, Mikimoto broke patent no. 2670 into two component claims, one for the “partially cut” nucleus and the other for the salt processing step. Both were set apart from an “ancient method.”²⁵⁹

The rejection of Mikimoto’s infringement claims did not end practices of pearl cultivation patenting. To the contrary, the resolution of dispute over patent 2670 was nearly coterminous with the approval of patents for *spherical* pearl cultivation via processes that differed significantly from the *semi-spherical* pearl culture method described in Mikimoto’s initial patent.²⁶⁰ In 1916, more than eight years after Mise Tatsuhei’s first competing patent application, the patent office gave approval for three spherical pearl process patents in Nishikawa’s name—though not before issuing a patent for a spherical pearl induction process to Mikimoto a month before.²⁶¹ Dozens of patents

²⁵⁷ “Meiji 45 nen (re) dai-1572-go,” *Daishin’in keiji hanketsuroku dai-18-shu, dai-23-kan* (Tokyo, 1912), p. 1331-1332.

²⁵⁸ *Japan and her exhibits at the Panama-Pacific International Exposition* (Tokyo, 1915), p. 196-197.

²⁵⁹ *Shinju yōshoku ni kansuru hōritsu kankei*, (Nagoya: Nagoya Kōsoin, 1935).

²⁶⁰ *Mise Tatsuhei shuki* (1923).

²⁶¹ Mikimoto received patent no. 29409 on 5 May 1916; Nishikawa’s patents nos. 29628, 29629, and 29630 were granted on 16 June 1916.

followed for Mikimoto and others.²⁶² With these and subsequent industrial property rights, Mikimoto's competitors ceased their public campaigns against Mikimoto's first patent and the institutions that appeared to support it.

As long as Japanese patentees held industrial property rights over spherical pearl methods, cultivators had little choice but to legally distinguish their own processes or else find space under someone else's patent umbrella. Mikimoto did not sell access to his methods, but other patent holders licensed patents for pearl oyster tissue transplants and instructed licensees in how to cut into a living shellfish without killing it. This came at a hefty price. Under the first licensing agreements for the "Nishikawa method", payments could exceed one third of a licensee's future revenues.²⁶³

Even so, patent proliferation did not stop efforts to gain other kinds of competitive advantage. Craft secrecy and public patents went hand in hand. As one Mikimoto employee who joined the company in the 1930s later put it, "the operating room worked on the principle of complete secrecy."²⁶⁴ Another Nagasaki-based cultivator noted of the pearl industry prior to the Second World War that "it was unthinkable to share your own techniques with outsiders."²⁶⁵

²⁶² One 1935 pamphlet listed fifty pearl-related patents covering methods of pearl induction and other implements like the cages used in the raising of pearl oysters. See *Shinju yōshoku ni kan suru hōritsu kankei* (1935).

²⁶³ Nishikawa entered into technical licensing agreements as early as 1908, well before the patent was issued. See Kuru Tarō, *Shinju no hatsumeisha wa dare ka?: Nishikawa Tōkichi to Tōdai purojekuto*, (Tokyo: Keisō shobō, 1987), p. 327-328.

²⁶⁴ Kuru, *Shinju no hatsumeisha wa dare ka?*, p. 153.

²⁶⁵ *Shin'en shinju nanajūnen* (Tokyo: Shinju shinbunsha, 1978), p. 130.

Infringement claims, moreover, remained difficult to pursue. As one zoologist at the time commented, “with objects such as pearls, where secret surgical methods are used in their production, it is very difficult to enforce claims of infringement.”²⁶⁶ Smoking-gun evidence was bound to be scarce when one attempted to evaluate subtly differing procedures, each one performed by cagey technicians who hid themselves and their techniques behind the walls of enclosed surgical operating rooms and under the shells of living pearl oysters. Under such conditions, licensing someone else's patent, even if the substance of one's practical cultivation methods did not precisely correlate to its published claims, could buy a shield from potential lawsuits in the first place.

Finally, cultivator-led organizations became a locus of negotiation, not tribunals and courts. No legal battles remotely approaching the length or vitriol of the dispute over patent no. 2670 would reach a courtroom or tribunal during the active lives of the first spherical pearl patents. Over the coming decades, calls for extra-judicial technical self-policing *among* a growing number of spherical pearl cultivators would bring the issue of cultivator coordination to the fore.²⁶⁷ Even so, the boundaries of subsequent pearl cultivator communities, of which one Mikimoto-led instantiation became known informally as the “patent control association” (*tokkyo tōsei kumiai*), were themselves shaped fundamentally by state-authorized industrial property rights.²⁶⁸

²⁶⁶ Kawamura Tamiji, “Nihon no shinju,” *Kaizō* (December 1927), p. 49.

²⁶⁷ Ozeki Nobuaki, “Senzen ni okeru shinju dantai no hensen,” *Suisan jihō, shinju tokushū* (1958), pp. 12-28.

²⁶⁸ *Shin'en shinju nanajūnen*, p. 49.

Conclusion: The Afterlife of Patent no. 2670

The legal status of invention changed several times between Mikimoto's first patent application in 1894 and the sweeping postwar overhaul of Japan's patent law in 1959 that, with a number of modifications, remains in effect.²⁶⁹ Examiners examined Mikimoto's 1894 application under the 1889 law's specification of a "novel and profitable industrial method, machine, manufactured good, or synthetic object."²⁷⁰ Judges judged patent no. 2670 under the 1899 law's specification of "a first and original invention of any industrial article or process."²⁷¹ By contrast, their post-1959 counterparts evaluated whether incoming applications exhibited the "highly advanced creation of technical ideas utilizing natural laws."²⁷²

When it came time to work through relationships among patent law, natural laws, and living creatures, some latter-day Japanese officials looked to patent no. 2670. Upon being asked in 1963 about the possibility of granting plant patents under Japanese law, head patent examiner Yoshifuji Kōsaku replied as follows:

A patent invalidation suit was once brought against the production method for the cultured pearl, Mr. Mikimoto's world-class invention, on the grounds that it did not fit within the idea of an industrial invention. They said that it was a fisheries invention. However, the [patent office's] ruling avoided the invalidation claims by taking the line of reasoning that, in the sense that Mikimoto had added a so-called manufacturing step (*kōteki na shudan*), it was industrial. The *Daishin'in* high

²⁶⁹ As of 2005, there had been 25 revisions to the law since 1959, including Japan's 1980 signing of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure. See Wilhelm Röhl, ed., *History of Law in Japan Since 1868* (Brill, 2005), pp. 409-410.

²⁷⁰ Suzuki Hikoto, *Hatsumei tokkyohō annai* (Tokyo: 1890), p. 51.

²⁷¹ *Laws of Japan: Patent Law, Patent Rules, Trade-mark Law, Trade-Mark Rules, Design Law, Law of Registration Tax* (Yokohama: "Japan Mail" Office), p. 1; *Nihon roppō* (Tokyo: 1899), p. 228.

²⁷² Doi Teruo, *The Intellectual Property Law of Japan* (Sijthoff and Noordhoff, 1980), p. 9.

court also supported this line of reasoning. This does not apply only to fisheries inventions. As long as they include a manufacturing step, agricultural inventions should also be patentable. If such is the case, then plant patents should obviously be permitted as well. However, the plant patents I speak of here would not be for plants themselves, but rather for methods of raising plants or other cultivation methods along the lines of cultured pearl production methods.²⁷³

Patent no. 2670, in short, came to serve as a test case for the incorporation of living creatures into Japan's system of industrial property rights.²⁷⁴ If *criminal* court rulings crippled Mikimoto's claims in particular, *civil* courts and patent tribunals used his patent to confirm the patentability of methods that "aided nature's laws" in general.

Mikimoto's subsequent chroniclers later suggested that patent examiners had once informed Mikimoto in 1894 that his semi-spherical method was the first patent application they had ever seen to involve a "*seibutsu*," a living creature.²⁷⁵ Other Japanese legal commentators, too, identified rulings on Mikimoto's first patent as a key precedent for the patentability of agricultural and aquacultural processes that involved living creatures—including the very *spherical* pearl culture processes that Mikimoto and his competitors had come to patent for themselves.²⁷⁶ If nothing else, the substantially

²⁷³ "Tokkyohō semina," *Jurisuto* no. 286 (15 Nov. 1963), p. 31.

²⁷⁴ Mark D. Janus points out that along with the United States, "the practice of issuing utility patents on plants now appears to be well-established in Japan, South Korea, and Australia." He notes that "no definitive judicial decision has been rendered to date, but the Examination Guidelines of the Japan Patent Office (JPO) assume that plants can constitute patent-eligible subject matter. Mark D. Janus, "Patenting Plants: A Comparative Synthesis," in Ruth L. Okediji and Margo A. Bagley, eds., *Patent Law in Global Perspective* (Oxford, 2014), pp. 217-218.

²⁷⁵ Mamada Takashi, *Yōshoku shinju no hatsumeisha Mikimoto Kōkichi*, (Tokyo: Nihon Shuppansha, 1942), p. 215. Ototake Iwazō, *Denki Mikimoto Kōkichi* (Tokyo, 1950), pp. 78-79.

²⁷⁶ The jurist Kiyose Ichirō cited the 26 July 1910 Patent Tribunal appeal ruling 612 against Nagatsuka and the Kitamuras' patent invalidation claims in the patent law standard *Tokkyohō genri* (Tokyo: Chūō shoten, 1922), p. 89. A discussion of the 1909 patent office ruling on patent no. 2670, seemingly gleaned from a translation of Kiyose's writings, found itself into a lengthy (and uncited) footnote in Stephen A. Bent, *Intellectual Property Rights in Biotechnology Worldwide* (Macmillan, 1987), pp. 73-74. For an early discussion

weakened claims that constituted patent no. 2670 were, following their ten-year extension, the longest-lived industrial property rights ever issued in Japan upon their unheralded expiration in 1921. But the patent's effects continued to be felt. Amid a slew of rulings on patent no. 2670, Japanese courts provided a route to allow whichever person or persons could legitimate ownership claims over ways to make looms and pearl oysters (and even other living things) produce for markets at home and abroad.

Several kinds of interpretive ambiguity stemmed from the trials over patent no. 2670 and their aftermaths. To Mikimoto's competitors, patent dispute freed access to an "ancient" semi-spherical pearl culture method and, with the granting of a new round of patents to applicants besides Mikimoto, allowed for broader-based access to methods of *spherical* pearl culture. For his part, Mikimoto began to treat patent no. 2670 and other semi-spherical methods as distant technological precursors, not claims that had laid the groundwork for his continued reputation as an inventor. Mikimoto ceased to base his claims of inventive priority and industry leadership on a single, decisive patent, preferring instead to present images of pearl cultivation to audiences of patrons—whether retail customers, foreign zoologists, or the Japanese imperial household—as a story of development that underlay a subtly changing but consistently branded "Mikimoto method." Mikimoto's aquatic production and promotional focus soon turned toward the techniques of spherical pearl cultivation for which his company in particular became widely known abroad after the First World War, even as multiple patents defined and

of "living creature" patents that refers to spherical pearl patents, see also Murayama Toshizō, *Senbai tokkyo to wa: saishin tokkyo hō to jitsuyō shin'an hō* (Tokyo, 1942), pp. 48-49.

protected them within the Japanese empire. The “Japanese cultured pearls” that those techniques made possible would provoke a sensation across Europe.

Chapter Three

The Trials of La Perle Japonaise: Separating Nature from Culture in 1920s Paris

Jean de La Fontaine's seventeenth century rendition of the Aesopic fable "Le Coq et la Perle" tells the story of a rooster that finds himself in possession of what he believes to be a "fine" pearl. The rooster trades his pearl away to a prominent lapidary dealer in return for a bit of grain to eat, claiming that a millet seed would serve his purposes far better than the pearl. Even though the rooster calls his pearl a *perle fine*—something worth a great deal to lapidary dealers and the people who might subsequently buy their wares—he lets it go for what the dealer would have considered a pittance.²⁷⁷

The opening premise of La Fontaine's fable—an object identified by all who saw it as a *perle fine*, but which was little appreciated by its original possessor—took a different tenor in a 1922 issue of the French weekly humor magazine *Le Journal Amusant*. The cover displayed a large white pearl with a gaping crack, revealing a mustachioed, Asiatic caricature popping its head out in front of a topless, recoiling, and Westernesque female figure. The image's caption, "*Le Coq et la Perle...Japonaise*," attempted to inject levity into developments that had shaken buyers and sellers of pearls (Figure 1).²⁷⁸

²⁷⁷ Jean de La Fontaine, *Fifty Fables of La Fontaine* (University of Illinois, 1997), pp. 16-17. The second verse tells a parallel story of a man with a rare and valuable manuscript who brings it to a bookseller in exchange for a single ducat.

²⁷⁸ *Le Journal Amusant* v. 75 n. 189 (23 Dec. 1922).

The arrival of new spherical pearls from Japan alarmed the precious stone and lapidary association whose members bought and sold more pearls than anywhere in Europe, the Paris Chambre Syndicale des Négociants en Diamants, Perles, Pierres Précieuses et des Lapidaires.²⁷⁹ After the First World War, members of the Chambre Syndicale, along with their counterparts in the London Chamber of Commerce's Diamond, Pearl, and Precious Stone Trade Section, turned the "Japanese" pearl into an issue of legal demarcation and technical enforcement. In London, the aftermath of a 1921 "faked pearl sensation" involving pearls cultivated in Japan inspired debate across great swathes of the early twentieth century world. What was the relationship between a pearl and its value?²⁸⁰ If pearls were not just ornament but treasure as well, delineating the qualities that might support pearl dealers' current—and, crucially, future—evaluations was a pressing concern. Could you trust yourself, or anyone else, to tell a pearl of great price apart from an imposter that looked virtually the same on the surface?

²⁷⁹ Micheline Cariño, "The Cultured Pearl Polemic," *World Aquaculture* 27, no. 1 (1996), pp. 42-44. See also Micheline Cariño and Mario Montefiore, *Une Histoire Mondiale des Perles et des Nacres: Pêche, Culture, Commerce* (Paris: L'Harmattan, 2005).

²⁸⁰ Other historians of science and anthropologists have used precious stones and metals to think about parallel processes of standardization, market formation, authentication, and constructions of scarcity. In a variety of ways they have sought to address a longstanding yet vexatious issue: what has made precious stones "precious"? See Robert Proctor, "Anti-Agate: The Great Diamond Hoax and the Semiprecious Stone Scam," *Configurations* 9, no. 3 (Fall 2001), pp. 381-412; Andrew Walsh, "The Commodification of Fetishes: Telling the Difference Between Natural and Synthetic Sapphires," *American Ethnologist* 37, no. 1 (2010), p. 102; Mark Morrison, *Modern Alchemy: Occultism and the Emergence of Atomic Theory* (Oxford University Press, 2007).



Figure 1. “Le Coq et la Perle...japonaise.”²⁸¹

Pearl dealers and their corporate associations strove to maintain trust in the labeling of their products. The problem was that the new pearls made them doubt their own eyes. Existing dichotomies of the genuine gemstone and the glass or “paste” imposter, a key plot device of *fin-de-siècle* stories by Henry James and Maupassant, did not adequately contain Japanese pearls or other kinds of “synthetic,” “reconstituted,” or “scientific” stones. Pearl dealers scrambled to make new distinctions. A pearl which had

²⁸¹ *Le Journal Amusant*, 23 December 1922.

formed in a living shellfish as a result of “the hand of man,” they eventually decided, was a “cultured” or “cultivated” pearl. A pearl which had developed independent of human intervention was an “accidental” or “natural” pearl that alone deserved the status of a gem-quality object. The intractable problem with such a distinction was that, once pearls had left the shellfish and the coastal waters from which they had been plucked, it was not immediately apparent from a visual inspection how, or from where, they had come to be.

The linkage of distinctively Japanese-authored artifice with the threat of commercial deception provoked transnational alliances of wholesalers against Japanese pearls. In Paris, many in the complex and regulated ecosystem of the city’s early twentieth century pearl and precious stone trade associations—encompassing wholesalers, overseas buying agents, go-betweens, and retail jewelers—supported the creation and enforcement of distinctions between natural and cultured pearls. They looked for a way to make the *perle japonaise* known to them.

The *Journal Amusant*’s image of a “Japanese” man emerging from a pearl was shocking, but revelatory. It was a vision of a *perle japonaise* that might, at some point in time, show its true character for all to see. But as consensus built that Japanese pearls were difficult—if not impossible—to spot from the surface, leaders of the Paris Chambre Syndicale began to focus on the people who handled them as well. The Chambre Syndicale soon trained its attention on one of its own members, an art dealer and sometime pearl importer named Lucien Pohl. Pohl also happened to serve as the Mikimoto Pearl Company’s Paris agent. By the late 1920s, legal rulings against Pohl had combined with the transnational exchange of pearl testing methods to create openings

for the *Chambre Syndicale* (and, soon after, the London Chamber of Commerce's Diamond, Pearl, and Precious Stone Trade Section) to enforce a system of legally separated "natural" and "cultured" pearl nomenclature by using testing as a way to infer whether or not a pearl had formed from a nucleating object implanted, years before, inside a living shellfish. In spite of their claims to be connoisseurs of surfaces, members of the *Chambre Syndicale* came to argue that a pearl's value could be ascertained only after an examination of its inner structure. In Paris, legal disputes over the proper ways to sell pearls worked through French courts alongside the development of pearl testing methods. By the mid-1920s, pearl tests, pearl testing apparatus, professional pearl testers, and dedicated pearl testing laboratories appeared amid, and helped to support, legal rulings over what to call the products of Japanese pearl cultivation in relation to other pearls.

The pearl testing infrastructure that emerged in the 1920s—and that still, in reconfigured forms, exists to this day—did not by itself resolve the question of whether stable and distinct natural and cultured pearl types existed. To the contrary, the opposition of nature with culture in pearl testing laboratories was premised upon the results of fierce debates, in courtrooms and in a range of publications, over whether such a division could or should be enforced in the first place.²⁸² The market order that ensued

²⁸² This chapter bears upon the historical and sociological critique of an economics literature that deals with the relationship between information and markets. The economics position is exemplified by George Akerlof's classic article on "The Market for Lemons," which starts from the premise that owners of "good" used cars are less willing to put their vehicles on the market because an unknown but definite number of all used cars are "bad" cars (or lemons). Akerlof concludes that the existence of an information asymmetry between the seller (who knows whether the car is good or bad because he or she has driven it long enough to know) and the potential buyer (who does not know) will tend to drive the "good" cars out of the used car market as potential buyers come to expect a discount to account for the possibility that they will be stuck

found favor among buyers and sellers who hoped to do business with people willing to pay a hefty premium for something other than the “cultured” pearls which, at the time, came from a combination of hands and shellfish along the Japanese empire’s coastlines.

Picking Paste from Pearls

*Although art has made wonderful progress in that direction, the pearl, like truth, is not easily imitated.*²⁸³

Through the nineteenth century, jewelers and many other commentators in Europe and the United States classed the materials of purported pearls into two types. On one side sat gem-quality objects; on the other, imitation or artificial ones. Imitation gems were most often made of glass, also known as paste or strass. The manipulation of glass into the image of a gem was a skill that philologists and aspiring alchemists of the nineteenth century dated back to classical Egyptian artisans. The polymathic member of the French

with a lemon. In response, researchers of a more historical and sociological persuasion, many of them using France’s experience as evidence of inter-group contestation regarding the production of signs of quality, have argued that the categories of quality that underpin any subsequent postulation of market asymmetry between buyers and sellers do not exist ready-made in any natural or apolitical form. They stake the claim that, contrary to the implications of Akerlof’s article, product qualities have histories, just as markets do, precisely because definitions of quality are not cleanly separable from definitions of markets. “Lemons” are not predefined, nor are their markets. See George Akerlof, “The Market for “Lemons”: Quality Uncertainty and the Market Mechanism,” *Quarterly Journal of Economics* v. 84 n. 3, pp. 488-500. Critiques of Akerlof’s approach encompass a wide range of work on how markets have developed and functioned. A subset relevant to this chapter includes Alessandro Stanziani, *Rules of Exchange: French Capitalism in Comparative Perspective* (Cambridge University Press, 2012); “Dossier-Débat: La Qualité,” *Sociologie du travail* v. 44 (2002), pp. 255-287; Stanziani, “Les Signes de Qualité: Normes, Réputation et Confiance (XIX-XX siècles),” *Revue de synthèse* 5e série (Feb. 2006), pp. 329-358; Koray Caliskan and Michel Callon, “Economization, Part 1: Shifting Attention from the Economy to Processes of Economization,” *Economy and Society* v. 38 n. 3 (2009), pp. 369-398; Caliskan and Callon, “Economization, Part 2: A Research Program for the Study of Markets,” *Economy and Society* v. 39 n. 1 (2009), pp. 1-32.

²⁸³ George F. Kunz and Charles H. Stevenson, *The Book of the Pearl: Its History, Art, Science and Industry of the Queen of Gems* (New York: The New York Century Co., 1908), p. 61.

Académie Royale des Sciences, René Antoine Ferchault de Réaumur, wrote in 1716 that since at least the mid-seventeenth century Paris had been known for the manufacture of *perles fausses* or *perles artificielles*.²⁸⁴ These objects were constructed from glass balls filled or coated with *essence d'orient*, a lustrous compound made from the scales of the *ablette*, a fish then common to the Seine.

At the turn of the twentieth century, inexpensive pastes continued to find buyers in France and elsewhere. Stories like Maupassant's "La Parure" (1884) and Henry James's "Paste" (1899) tapped into fears over the possibility that gems could fool onlookers, and even a (female) wearer herself.²⁸⁵ This could happen if one thought that a piece of paste was genuine when in fact it was an imitation, as with Maupassant. The reverse, that a seeming imitation could turn out to be real, found a place in James's story. In James's "Paste," cousins Charlotte and Arthur find a strand of pearls among the belongings of Arthur's deceased stepmother. They argue whether the pearls, "nearly as big as filberts," could be real. Charlotte agrees that one would not expect a strand of gem-quality pearls such as the ones they discovered to have been hidden away:

"Do you imagine for a moment they're real?"
She studied them a little, feeling them, turning them round. "Mightn't they possibly be?"
"Of that size—stuck away with that trash?"
"I admit it isn't likely, Charlotte presently said. "And pearls are so easily imitated."
"That's just what—to a person who knows—they're not. These have no lustre, no play."²⁸⁶

²⁸⁴ de Réaumur, "Observations sur la Matière qui colore les Perles fausses...", *Histoire de l'Académie Royale des Sciences, Année 1716* (Paris: Imprimerie Royale, 1718), p. 229.

²⁸⁵ See Aviva Briefel, *The Deceivers: Art, Forgery, and Identity in the Nineteenth Century* (Cornell University Press, 2006), especially chapter 5.

²⁸⁶ Henry James, *Henry James: Complete Stories 1898-1910* (The Library of America, 1996), p. 139.

Charlotte begins to suspect that the pearls might be “real,” and decides that she wants to have them for herself. At this juncture Arthur promises to get a professional appraisal:

“They’re what I originally said they were. They’re rotten paste.”

“Then I may keep them?”

“No. I want a better opinion.”

“Than your own?”

“Than *your* own...You say I’m afraid,” he went on as he again met her, “but I shan’t be afraid to take them to Bond Street.”

“And if the people say they’re real—?”

He hesitated—then had his strangest manner. “They won’t say it! They shan’t!”²⁸⁷

Even while emphasizing his protagonists’ lack of certitude (or, as it turns out in this case, a feigned lack of certitude, as Arthur knows that the pearls are real), James reserved to gem dealers and pawnbrokers an authoritative say in the identity of the pearls.

Throughout the nineteenth century and into the twentieth, members of the gem industry were themselves confident that, though the public might be easily confused by paste and precious stones, the line between a genuine gem and its artificial counterpart could be elucidated based on readily observable properties. For the gem dealer Harry Emanuel, the separation of pearls from paste did not seem to require any apparatus at all: “In the case of pearls, which are frequently imitated with marvellous skill, it will be seen that false pearls are much lighter than real ones; that generally the former are brittle (although some are made solid, of fish-scales, and do not break so easily); and the holes, which in the real pearl are drilled very small, and have a sharp edge, in the false are larger,

²⁸⁷ James, *Henry James: Complete Stories*, pp. 149-150.

and have a blunt edge.”²⁸⁸

George Frederick Kunz, head jeweler at Tiffany’s of New York, added that a glass specimen was unlikely to escape the judgement of the jeweler. “There is as much difference between the ubiquitous imitations and the perfect gem as there is between a chromolithograph and a silvery Corot, or between the effects of cosmetics and the freshness of youth,” wrote Kunz. “While to the unskilled, or under superficial inspection, the false has some of the properties of the genuine, it is only necessary to place them side by side to make the difference apparent. However clever the imitation may be in color, in form, and in density, it always lacks in richness, in sweetness, and in blended iridescence.”²⁸⁹ Identifying pearls was akin to picking out an ill-executed forgery or detecting blush on a woman’s face. Difficult for the uninitiated perhaps, but not for someone with skill and experience. The risks of material deception were thus framed in terms of gem dealers, who claimed to tell paste from precious stones, and the general public, which was at risk of paying diamond prices for glass baubles.

²⁸⁸ Harry Emanuel, *Diamonds and Precious Stones: Their History, Value, and Distinguishing Characteristics, with Simple Tests for their Identification* (London: John Camden Hotten, 1867, 2nd ed.), p. 219.

²⁸⁹ Kunz and Stevenson, *The Book of the Pearl*, p. 61.

The Ruby from the Crucible and the Gem from Afar

So stupendous, however, are the powers of nature that the possibility of reproducing, by human agency, the treasured stones which are extracted from the earth in various parts of the globe at the cost of infinite toil and labour has always been derided by those ignorant of what had already been accomplished. Great, therefore, was the consternation and the turmoil when concrete evidence that could not be gainsaid showed that man's restless efforts to bridle nature to his will were not in vain, and congresses of all the high-priests of jewellery were hastily convened to ban such unrighteous products, with what ultimate success remains to be seen.²⁹⁰

The application of synthetic inorganic chemistry to the precious stone trade made possible the production of sapphires and, especially, rubies composed of aluminum oxide-based corundum. With particular fanfare in France, chemists at the end of the nineteenth century announced the successful production of precious stones under conditions that their detractors would denigrate as alchemical pursuits. In Paris, Edmond Frémy and Charles Feil developed a process that produced minute quantities of ruby flakes during the 1870s. By the turn of the twentieth century, Frémy's student Auguste Verneuil had devised a method for the large-scale production of synthetic stones from the melting and recrystallization of powdered alumina and chromium oxide. "Scientific" rubies had many of the same properties as rubies taken from underground mines. Their chemical constitutions, densities, and indexes of refraction were identical, as far as early twentieth century observers could measure.²⁹¹

Synthetic gem stones raised two related questions. The first, based on the intervention of human hands and tools at a crucial moment in the object's formation, had to do with divisions of nomenclature. Should a synthetic object be defined in contrast to a

²⁹⁰ G. F. Herbert Smith, *Gem-Stones and their Distinctive Characters* (London: Methuen & Co, 1912), pp. 113-114.

²⁹¹ Smith, *Gem-Stones and their Distinctive Characters*, pp. 115-120.

natural one? The second question was one of observable differences in the object itself, not simply the labor that had attended its production. Dealers and buyers did not regularly witness the mining that went into the gathering of the stones they sold as gem-quality specimens. Nor, for that matter, did they watch powdered aluminum oxide pass through a two-thousand-degree Celsius oxyhydrogen flame in the synthesis of corundum. Unless examination of a ruby revealed evidence of its method of production, no further testimony was likely to be forthcoming.

In the early twentieth century, the Paris Chambre Syndicale published cases in which Verneuil rubies had been sold just as gems mined in Burma or elsewhere.²⁹² The Nobel Prize-winner Henri Moissan also reported the creation of diamonds from charcoal under extremely high temperatures.²⁹³ The possibility that a synthetic gemstone might elude all methods of appraisal briefly appeared in 1905, when an itinerant French engineer named Lemoine convinced a De Beers' board member that he had a recipe for producing diamonds. By the time a safe containing his diamond recipe had been opened, revealing that his recipe contained no specifics about how the necessary temperatures and pressures would actually be achieved, Lemoine's claims and other announcements of diamond synthesis faced vigorous debunking efforts from gem dealers.²⁹⁴ Amid early

²⁹² *Recueil mensuel des Procès-Verbaux des Séances de la Chambre Syndicale de la Bijouterie, de la Joaillerie et de l'Orfèvrerie de Paris* n. 34 (Supplement, April 1909), p. 1.

²⁹³ Lance Grande and Allison Augustyn, *Gems and Gemstones: Timeless Natural Beauty of the Mineral World* (Chicago: University of Chicago, 2009).

²⁹⁴ "Lemoine has fled, no diamonds made," *The New York Times* (June 18, 1908), p. 7.

twentieth century concerns over the names ascribed to objects like Verneuil rubies and glass pearls, France's foundational 1905 law regulating fraud (which concerned a product's name) and adulteration (which concerned a product's contents) came to cover precious stones along with wine, champagne, and milk.²⁹⁵ As a result, no one could sell glass pearls without appending the word "imitation" to those products.

The increasing ubiquity of factory-produced synthetic gems and claims testifying to their successful production unsettled some members of the trade. Starting in 1913, gem dealers in Vienna sponsored a laboratory for the testing of colored stones. It was headed by mineralogist Hermann Michel, future chief of the city's natural history museum (and later developer of instrumental methods for testing pearls). The Paris precious stone purveyor Chaumet also built a private laboratory for corundum testing.²⁹⁶

Nevertheless, mineralogists like Herbert Smith argued that even the synthetic gems that found their way into store display cases retained slight but tell-tale signs of their production. Air bubbles left traces inside the fast-cooling aluminum oxide mixtures, as did the curved layers that developed as the liquid dripped into the form of an inverted bubble-shaped *boule*.²⁹⁷ Not long after Edmond Frémy's first successful synthetic ruby

²⁹⁵ "Le procès des marchands de bijoux faux," *Le Diamant* v. 12 n. 138 (30 June 1909); "Les perles de culture et l'application de la loi du 1er août 1905, par M. le Professeur Cazeneuve," *L'Union pharmaceutique* no. 1860 (15 June 1922).

²⁹⁶ "Ouverture à Vienne d'un laboratoire pour les essais de pierres précieuses," *Recueil Mensuel des Procès-Verbaux des Séances de la Chambre Syndicale des Négociants en Diamants, Perles, Pierres Précieuses et des Lapidaires*, no. 19 (February 1914), p. 347.

²⁹⁷ Smith, *Gem-Stones and their Distinctive Characters*, pp. 119-120.

production had been announced at the Académie des Sciences in 1877, Henri Vever, the head of Paris's Chambre Syndicale des Bijoutiers, Joailliers et Orfèvres, pointed out that structural differences were visible with the naked eye or with a jeweler's low-power magnifying lens, the loupe.²⁹⁸ It was not the case, as we have seen, that dealers themselves felt unable to tell natural apart from synthetic, but rather that the public at large might be misled into believing that a "scientific" ruby had arrived fully formed (though yet to be faceted) from the ground.

Concern was also growing over the intermingling of existing precious stone supplies with those from new sources. Nearly all the gems that arrived in European entrepôts came from far-off places. Rubies and sapphires from Burma and Siam arrived in Paris during from the mid-19th century.²⁹⁹ Many diamonds had been supplied from Brazil from the eighteenth to the early nineteenth centuries, but historian Philip Nord has noted that Parisian shopkeepers responded negatively to an influx of cheap South African diamonds, which began coming from the DeBeers Consolidated Mines during the 1880s.³⁰⁰

Commercial nomenclature was a topic of increasingly heated debate during the first and second decades of the twentieth century. Specifying the provenance and

²⁹⁸ "Séance du 18 Décembre 1877," *Recueil mensuel des Procès-Verbaux des Séances de la Chambre Syndicale de la Bijouterie, de la Joaillerie et de l'Orfèvrerie de Paris* 3 (1878), pp. 19-22.

²⁹⁹ Jacqueline Viruega, *La Bijouterie Parisienne: Du Second Empire à la Première Guerre Mondiale* (L'Harmattan: Paris, 2004), p. 27.

³⁰⁰ Philip Nord, *The Politics of Resentment: Shopkeeper Protest in Nineteenth-Century Paris* (Princeton: Princeton University, 1986), p. 195.

method of gathering or production of gems and precious stones turned into a vital part of gem associations' work. By the beginning of the twentieth century, buying "natural," "oriental," "fine," or "precious" gems meant allying oneself not just with a trustworthy neighborhood dealer, but with a trustworthy global supply chain.

The Trade in Trust

*In professions such as ours, where we can pass all our merchandise in our pockets, ordering what we want from agents whom we do not know at all, there is but one method: it is trust.*³⁰¹

The trade in pearls was built around displays of trust. In Paris and London, transactions occurred along the streets and cafés of certain neighborhoods. For "the pearl merchants who hold their special Bourse or market at a café in the Rue Lafayette where the precious objects pass from hand to hand on slips of tissue paper,"³⁰² the seeming nonchalance with which transactions were conducted underscored the confidence with which dealers could exchange small packets of pearls and precious stones for thousands of pounds or millions of francs.

Gem dealers were interlinked by kinship, religion, and location. In Europe, Jewish merchants, in particular Sephardic traders in Mediterranean port cities, had played integral roles in the trade in precious stones and other luxury items between the Eastern

³⁰¹ Procès-verbal de l'assemblée générale, 26 janvier 1922, *Recueil Mensuel des Procès-Verbaux des Séances de la Chambre Syndicale des Négociants en Diamants, Perles, Pierres Précieuses et des Lapidaires*, no. 56 (January 1922), p. 920.

³⁰² "Paris News & Notes," *The Daily Mail Continental Edition* (December 12, 1921), p. 3.

and Western parts of the Eurasian landmass, and points beyond.³⁰³ The Tenth Arrondissement in Paris and the Hatton Garden diamond district of London were the professional homes of predominantly (though by no means exclusively) Jewish communities of gem wholesalers, goldsmiths, and jewelry craftsmen. Local agglomerations of gem industry players were sustained by global trading contacts. In no area was this more evident than among wholesalers, who provisioned the raw materials on which the trade depended.

Wholesalers organized their businesses along lines that allowed them the most direct access to supplies of diamonds, rubies, emeralds, and pearls. Whereas London pearl dealers sourced their pearls overwhelmingly from the world's largest pearl entrepôt in Bombay, Paris-based dealers began traveling straight to the Persian Gulf, itself the source for most of the pearls in Bombay. The Persian Gulf supplied an estimated eighty percent of the world's pearls during the early twentieth century.³⁰⁴ Ever since Léonard Rosenthal and his brothers arrived in Bahrain around 1907 as the first Western dealers to buy directly in the Gulf—largely bypassing the Hindu and Muslim traders who shipped packets of pearls to Bombay for sorting, drilling, stringing, and auctioning--the center of gravity in the European pearl trade had steadily shifted from London to Paris.³⁰⁵

³⁰³ See, e.g., Francesca Trivellato, *The Familiarity of Strangers: The Sephardic Diaspora, Livorno, and Cross-Cultural Trade in the Early Modern Period* (New Haven: Yale University Press, 2009); Kris Lane, *Colour of Paradise: The Emerald in the Age of Gunpowder Empires* (New Haven: Yale University Press, 2010); Sarah A. Stein, *Plumes: Ostrich Feathers, Jews, and a Lost World of Global Commerce* (New Haven: Yale University Press, 2008).

³⁰⁴ Kunz and Stevenson, *The Book of the Pearl*, p. 80.

³⁰⁵ Matthew S. Hopper, "The African Presence in Arabia: Slavery, the World Economy, and the African

During the First World War, the cascade of pearls that came from the Indian Ocean to Europe ground to a halt. However, Parisian wholesalers, the Rosenthals among them, bought up the influx of pearls and precious stones that arrived with Russians who had emigrated to Paris in the wake of the 1917 revolution.³⁰⁶ As dealers began to restore links to their prewar suppliers, the Chambre Syndicale reported profits of some 220 million francs in 1920.³⁰⁷ The pearl trade, especially the French pearl trade, seemed poised to contribute significantly to French post-World War I recovery.

The Two “Japanese” Pearls

Mikimoto Kōkichi’s earliest efforts at marketing his products of pearl cultivation focused on how his products would fit into a pearl world divided between fine pearls and paste. “The “Culture-Pearl” is quite different from the Imitation pearl,” stated one of the company’s first overseas pamphlets at the turn of the twentieth century:

For the former is obtained by compelling the pearl-oysters to produce pearls; that is—after the seed pearls or small round pieces of nacre (mother-of-pearl) are inserted into the living oysters by a certain secret method, the oysters are put into the sea and kept there for at least four years, during which time the oysters cover the seed pearls or round pieces of nacre with their secretion, and thus pearls are formed. They then look just the same as the entirely natural jewels both as to color and lustre, so that one can hardly be distinguished from the other. (We hear of no other place in the

Diaspora in Eastern Arabia, 1840-1940” (PhD diss., UCLA, 2006), pp. 202-205.

³⁰⁶ L. Rosenthal, “La perle en 1922,” *Le Grand Négoce* v. 1 n. 7 (Dec. 1921), p. 2.

³⁰⁷ “Paris News & Notes,” *The Daily Mail Continental Edition* (December 12, 1921), p. 3.

world, where any one has succeeded in the culture of pearls in salt water).³⁰⁸

For most of the first two decades of the twentieth century, the Mikimoto Pearl Company's English-language term of "culture pearl" (and, among many overseas buyers, the term "Japanese pearl") referred to the roughly *hemispherical* objects that came from the insertion of a piece of glass or shell along the inside edge of a living pearl oyster's shell (Figure 2). Mikimoto hoped to market "culture pearls" as distinctive products that came via "a secret process" from "no other place in the world." Ago Bay and Tatokujima, the "Island of Abundant Virtue," featured prominently in his advertising, as we saw in Chapter 1. At the same time, Mikimoto tried to place his pearls within a hierarchy of value that separated them from imitations while stressing their aesthetic equivalence with "entirely natural jewels."

Wholesalers in Europe and the United States mounted semi-spherical pearls on brooches, pins, cufflinks, and bracelets by the hundreds of thousands. Not long after Mikimoto's salesmen first arrived in the United States in 1904, American customs officials ruled that buyers could indeed import hemispherical pearls in bulk under the same lower tariff as "natural" pearls, not as "manufactured" items. However, those same observers placed the semi-spherical pearl in a category apart from other natural pearls based on a

³⁰⁸ Newspaper Scrapbook 1904-1919, p. 187, located in Mikimoto Pearl Island Museum Archives (MPIMA). The specification of "saltwater" rather than "water" was a gesture toward the long history of freshwater pearl culture in China. Mikimoto was well aware of the extensive saltwater pearl culture experiments then taking place elsewhere in Europe and its colonial coastlines, but he and others considered his business to be the only one cultivating pearls (rather than breeding pearl oysters for pearl and shell, as Frenchman Gaston Vives was doing in Baja California on a large scale at the time). See Martha Micheline Cariño, *El primer emporio perlero del mundo: La Compania Criadora de Concha y Perla de Baja California S.A. y perspectivas para Baja California Sur* (Universidad Autonoma de Baja California Sur, 1999).

visual inspection: “These Japanese pearls, although of excellent quality, are easily distinguished by an examination of their base, and are of much less value than those produced entirely by natural means.”³⁰⁹

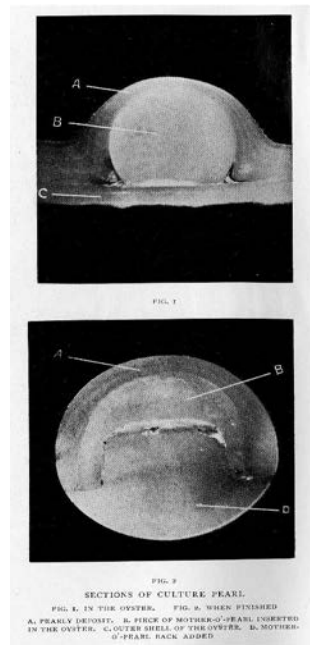


Figure 2. Semi-spherical “culture pearl” sections, on the half-shell (top) and mounted on mother-of-pearl.³¹⁰

Mikimoto Kōkichi built his company through the sale of semi-spherical “culture pearls.” Yet as we saw in the previous chapter, amid protracted Japanese legal debate over the legitimacy of his foundational semi-spherical pearl culture patent, Mikimoto and several other rivals began to test processes for farming spherical pearls.³¹¹ Like those of his

³⁰⁹ *Treasury Decisions Under the Customs, Internal Revenue, Industrial Alcohol, Narcotic and Other Laws*, v. 8 (U.S. Government Printing Office, 1905), p. 13.

³¹⁰ G. F. Herbert Smith, *Gem-stones and Their Distinctive Characters*, second edition (London: Methuen & Co., 1913).

³¹¹ See Chapter 2.

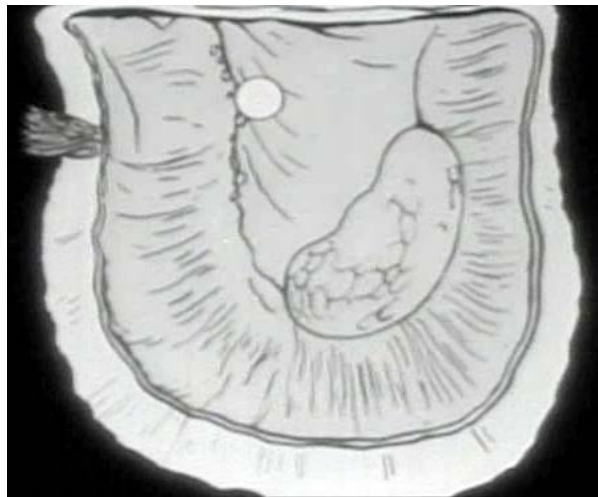
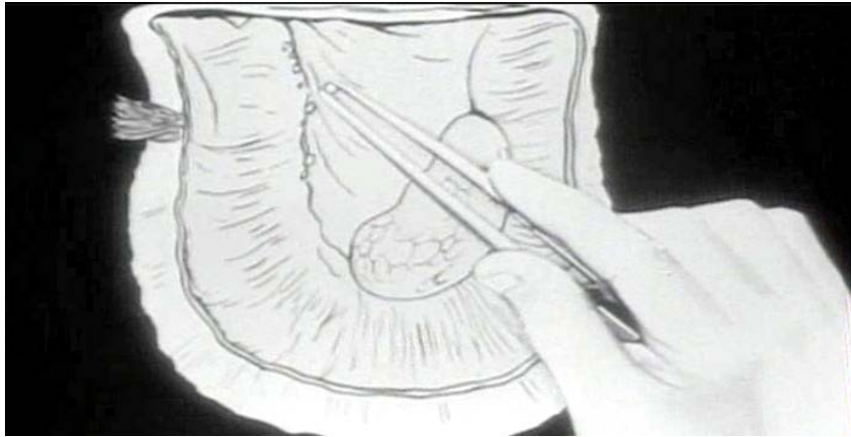
rivals, Mikimoto's method of round pearl culture was a form of tissue transplant surgery in which male (and, increasingly, female) technicians combined a spherical mother-of-pearl "nucleus" with the shell-secreting mantle tissue of a freshly-killed donor pearl oyster.³¹² Mikimoto's technicians placed the wrapped sphere completely inside the soft tissues of a recipient pearl oyster and guarded it in coastal waters for up to seven years—around three years longer than for his first iteration of "culture pearls."³¹³

Mikimoto saw round pearl cultivation as a way to market his products as part of one of the early twentieth century's costliest pieces of jewelry, the pearl necklace. Round pearls, after all, might sell for "ten times the price" of semi-spherical pearls.³¹⁴ Even so, Mikimoto hoped to sell round spherical pearls at less than prevailing rates for other fine pearls. He also wanted to introduce buyers to the patented method by which *his* spherical pearls—not "Japanese" pearls in aggregate—had come to be.

³¹² Through the 1920s, most nuclei came from thick-shelled freshwater shellfish (called in Japanese *dobugai*) that were gathered in China and Australia and exported to Japan via specialist merchants. One Japanese dealer recounted his experiences as a *dobugai* dealer based in Nanjing in Kitazawa Jūzō, *Goman ya jūman no hashitagane* (Tokyo: Kitazawa yōkō honten, 1925).

³¹³ For more on this method and its relationship to other competing spherical pearl methods, see Chapters 2 and 4.

³¹⁴ *Hōchi shinbun*, 16 November 1915.



Figures 3 and 4. A hand nucleates a pearl oyster and a pearl remains.³¹⁵

A silent promotional film entitled *The Romance of Pearl Culture in Japan* provided overseas audiences in the early 1920s with glimpses of the Mikimoto Pearl Company's retooled ways of working with living shellfish (Figures 3 and 4).³¹⁶ Early in the reel a drawing of an *akoyagai* pearl oyster, opened on the half shell, filled the frame. A paper cut-out of a hand grasping a long, shiny tool inched on screen toward the pearl oyster,

³¹⁵ "The Romance of Pearl Culture in Japan," c. 1922, Records of the U.S. Fish and Wildlife Service (National Archives Identifier 5791), Record Group 22.25, United States National Archives at College Park, College Park, MD.

³¹⁶ "The Romance of Pearl Culture in Japan."

where it deposited a tiny round object in the shellfish's body. A flickering animation showed additional layers of material accreting around the inserted object until, a few seconds later, a much larger round object sat atop the onscreen pearl oyster's exposed valve. The small object that had been inserted at the beginning was nowhere to be seen.

The “Faked Pearl Sensation”

In 1919, *Shinju (Pearl)*, the Mikimoto Pearl Company's Japanese-language product catalogue, announced that the company's spherical pearl process, initiated on a large scale in a new Gokasho Bay cultivation headquarters earlier in the decade, was at last yielding results.³¹⁷ That same year, company salesman Katō Toranosuke rejoined agent Samuel Jones in London's Hatton Garden diamond district to reopen what, before the war, had been the site of Mikimoto first overseas sales office.³¹⁸ Katō surely brought thousands of the semi-spherical pearls that remained popular items of adornment. This time, however, Katō also took along packets of Mikimoto's newer—and rounder—product.³¹⁹

Mikimoto's Paris agent Lucien Pohl was among the first in line for strands of the company's spherical product. Pohl had sold Mikimoto's semi-spherical “culture pearls” to jewelry makers in Paris, and elsewhere, since the early twentieth century. His family's

³¹⁷ *Shinju* v. 33 (September 1919). Located in Mikimoto Pearl Island Archives (MPIMA).

³¹⁸ *Mikimoto shinju 100 nenshi* (Tokyo: Kabushikigaisha Mikimoto, 1994), p. 77.

³¹⁹ Katō Toranosuke, *Mikimoto shujin to watashi to no kankei* (Mikimoto Kōkichi shiryō hensan iinkai, 1968). Located in Mikimoto Pearl Island Museum Archives (MPIMA).

longstanding connections to Japan put him in a unique position to do so; Pohl et Frères had operated as a trading office in Yokohama from the 1870s.³²⁰

Following a 1920 French government ban on the importation of “*perles fines*” from merchants unaffiliated with the *Chambre Syndicale*, the defense of the *perle fine* label had become a key plank of the association’s claims to authority in the pearl trade. By early 1921, the *Chambre Syndicale* began to sound alarms about how the new pearls from Japan were being sold in Paris. George Frederick Kunz, the head jeweler at Tiffany’s of New York and one of the world’s best-known authorities on pearls, remarked on the stir that sales of the new pearls had provoked:

At the meeting in Paris, Jan. 19, 1921, the Committee of the *Chambre Syndicale des Négociants en Diamants, Perles, Pierres Précieuses, et des Lapidaires*, warned the members against the deceptive designation given by some dealers to the Japanese pearl in calling it “*Perle Fine Japonaise*,” for these pearls are not genuine, and those dealers who offer them for sale as such lay themselves open to prosecution under the law for the suppression of frauds. For this reason, the committee decided to put the public on its guard in this matter by publication.³²¹

Less than four months later, a London incident involving the Japanese pearls turned the correspondence between a pearl’s properties and its name into global headlines. On May 4th, the *London Star* sounded an urgent cry over a “faked pearl sensation.” It reported that Japanese pearls had been mixed in among bunches of “natural Oriental pearls,” to the apparent surprise of a dealer in the Hatton Garden diamond district. Upon attempting to enlarge the pearls’ holes, which had been drilled too narrowly to allow for stringing as necklaces, the dealer had cracked one of the pearls,

³²⁰ *Recueil Mensuel des Procès-verbaux des séances de la Chambre Syndicale des Négociants en Diamants, Perles, et Pierres Précieuses* no. 38 (January-March 1919), p. 727.

³²¹ George F. Kunz, “The Production of Precious Stones in 1920,” *The Jewelers’ Circular* 83, no. 24 (Jan. 11, 1921), p. 51.

revealing a spherical “mother-of-pearl bead” in its core.³²² “The experts at the West End shops are besieged with a procession of pearl merchants anxious to obtain authentic opinion regarding cherished gems or ready to sell them or to exchange for gold articles or diamonds,” noted the *Times of India*.³²³ The “sensation,” it seemed, had revealed the ease with which some London dealers had, wittingly or unwittingly, sold the “Japanese cultured pearl” as the “Oriental” pearls that came from Bombay via places like Ceylon, Venezuela, Australia, and, above all, the Persian Gulf.

Dealers reorganized themselves in London. The day before the “faked pearl sensation” had first hit newsstands, the Diamond, Pearl, and Precious Stone Trade Section of the London Chamber of Commerce, an association that had lain dormant in a previous incarnation since just after the consolidation of the De Beers Mining Company in 1889. Within two days, five members constituted a Pearl Sub-Committee.³²⁴ By early 1922 the Trade Section had prepared a range of illustrated advertisements that focused on the “bead” in the center of a Japanese pearl (Figure 5).³²⁵

³²² *London Star*, 4 May 1921. *London Star*, 4 May 1921. One author critical of Mikimoto’s claims to inventive priority has suggested that the pearls involved in the London sensation may have come from a competing pearl cultivation startup in Shikoku, the Yodo suisan kabushikigaisha. Kuru Tarō, *Shinju no hatsumeisha wa dare ka?: Nishikawa Tōkichi to Tōdai purojekuto* (Tokyo: Keisō shobō, 1987), p. 235.

³²³ “The View in London,” *The Times of India* (May 11, 1921), p. 9.

³²⁴ 3 May 1921 and 5 May 1921, Diamond, Pearl, and Precious Stone Trade Section Minute Book 1921-1927, CLC/B/150/MS16600/001, LMA.

³²⁵ *The Jewelers’ Circular* v. 84 n. 2 (21 June 1922).

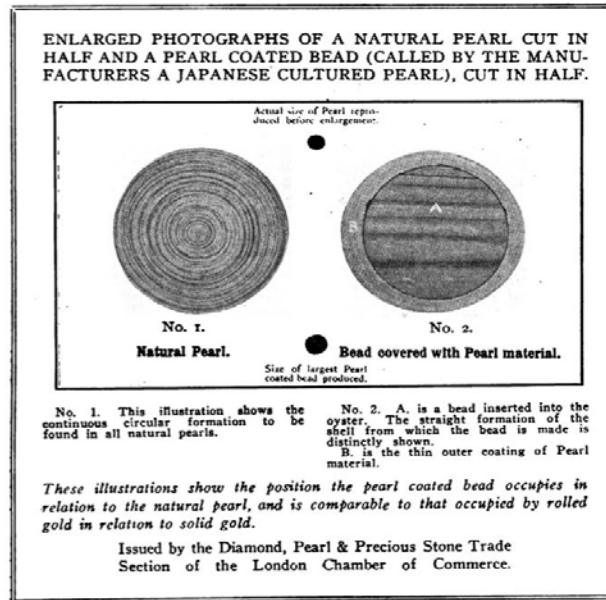


Figure 5. The “natural pearl” and the “bead covered with pearl material.”³²⁶

In Paris, the *Chambre Syndicale* had already begun to exercise its government-authorized right to prevent suspect pearls from entering France. It tried to warn buyers against incoming shipments of Japanese pearls arriving via London, charging that “Japanese pearls are fake pearls.”³²⁷ *Chambre Syndicale* President and French automaker family scion Hugues Citroën claimed that Japanese pearls “shock the eye of the connoisseur like a wrong note shocks the ear of the musician.”³²⁸ Léonard Rosenthal compared the influx of pearls from Japan to earlier run-ins with “scientific” gems: “The breeding parks of the Japanese seas are the equivalent of Moissan’s furnace and Frémy and Feil’s crucible. The Japanese pearl is the insalubrious sister of the deplorable

³²⁶ *The Jewelers’ Circular* v. 84 n. 2 (21 June 1922).

³²⁷ *Le Matin*, 29 January 1921.

³²⁸ “La folie des perles,” *Le Figaro* (24 May 1921), p. 4.

reconstituted ruby.”³²⁹

Other responses in Paris were more lighthearted. The *Journal Amusant* published playfully mocking verse structured as an interview between one of the publication’s reporters and Japan’s crown prince, the future Emperor Hirohito, who was then undertaking his first tour of Europe.

The Reporter

Prince! Son of the Rising Sun,
we ask for your enlightenment
to chase away the nagging doubt
that upsets our finest youths the most.

Is it a monumental boat
that has raised us above one of yours?
Or will they eclipse ours,
those treasures of Mikimoto?

The Prince

For those kind of trifles,
could Paris lose its renown?
Whether its necklaces are real (*vrai*) or not,
its women are always nice.

Do three strands of pearls wrapped around
the neck of an old Englishwoman
prevent us from being displeased
with the frail chest underneath the pearly white?

The most beautiful jewels on earth
are the roses of a young bosom
that offer, ignorant of the unsavory arts,
the tawdriness of Cythera.

And the necklace I’m crazy about
isn’t one of Golconda pearls;
They are the arms that a pretty blonde,
for a kiss, throws around my neck.

A pox on the oysters of my kingdom!
Although I am heir to the Mikado,
whenever I give a little gift
I choose it at Place Vendôme!³³⁰

³²⁹ Léonard Rosenthal, “Perles Japonaises et Rubis Reconstitués,” *Mercure de France* 1, (April 1922), p. 90.

³³⁰ Henri Doris, “Perles Japonaises,” *Le Journal Amusant* n. 110 (18 June 1921), p. 14.

Joking as its tone was, the ditty obliquely linked the Japanese cultured pearl sensation to another pressing diplomatic issue of the day, the upcoming Washington conference on naval shipbuilding limitations. Questions of national status loomed: could one nation's pearls—or one nation's ships—eclipse another's? At the same time, the poem suggested another way of looking at the pearl sensation. For many casual observers in Paris, a fight over pearls was worth little more than a laugh.

The Chambre Syndicale did not share the *Journal Amusant*'s sense of humor. In early November 1921, its president Hugues Citroën refused to grant Lucien Pohl authorization to import forty pearls from Mikimoto's London office. Pohl attempted to convince the French Customs Bureau that the Chambre Syndicale had failed to carry out the responsibilities to oversee pearl and precious stone imports that it had acquired as part of a 1920 ban in the importation of *perles fines* from people unaffiliated with the Chambre Syndicale.³³¹ The Customs Bureau replied that while it reckoned that cultured pearls were genuine pearls, it could not authorize importation without the assent of the Chambre Syndicale. However, Hugues Citroën told Pohl that because Japanese pearls were imitations, the Chambre Syndicale had no jurisdiction over them.³³² The forty pearls sat in limbo.

Mikimoto representatives, presumably Katō and Pohl, went to the Japanese

³³¹ Lucien Pohl to Directeur Général des Douanes, 4 January 1922. Box L'Huître Perlière I-Z, Bibliothèque de Malacologie, MNHN.

³³² Hugues Citroën to Lucien Pohl, 10 November 1921. Box L'Huître Perlière I-Z, Bibliothèque de Malacologie, MNHN.

embassy in Paris to ask for help.³³³ The embassy presented Mikimoto's case to the French Ministry of Foreign Affairs on November 28. "The way the Chambre Syndicale has handled things appears regrettable," noted the embassy, "all the more so as these methods are likely to unwittingly impede the development of sciences applied to nature."³³⁴ On January 7th, 1922, the Minister of Foreign Affairs sided with the Japanese embassy's protestations. That same day, Citroën informed the director of the French Customs Bureau that the Chambre Syndicale would allow Pohl to import 40 pearls, but only under the label "*perles imitation (perles de nacre cultivée)*." Pohl took exception to the Chambre Syndicale's proposed label. Through Mikimoto, Pohl again went to the Japanese embassy in Paris, which made contact with future French President Paul Doumer, then serving as Minister of Finance. Less than a week later, Doumer wrote to Pohl assuring him that Japanese pearls would be imported under the "same formalities and the same taxes as other *perles fines*."³³⁵ The French government revoked the Chambre Syndicale's gatekeeper privileges over imports of pearls and precious stones into France, transferring jurisdiction back to the Customs Bureau.³³⁶

In January 1922, Pohl resigned his membership in the Chambre Syndicale. His letter of resignation stated that Citroën and other high ranking members had been

³³³ *The New York Times*, 26 February 1922. Employees of the Mikimoto company, Pohl included, would remain in contact with Japanese embassy and consular officials in Paris and London throughout the 1920s.

³³⁴ 28 November 1921. Accessed through the Japan Center for Asian Historical Records (JACAR). Reference Code B11091968500, p. 16.

³³⁵ Paul Doumer to Lucien Pohl, 12 January 1922. Box L'Huître Perlière I-Z, Bibliothèque de Malacologie, MNHN.

³³⁶ *The New York Times*, 26 February 1922.

“systematically persistent in denying scientific evidence concerning *perles fine de culture japonaise*.”³³⁷ By February Pohl had filed suit against Citroën and the Chambre Syndicale in French civil court, claiming that the Chambre Syndicale’s published views that Japanese pearls were “false pearls” flew in the face of reports by other zoologists. As Pohl’s lawyer put it, Citroën had overseen a “campaign of denigration seeking to induce the public into error.”³³⁸

In May 1924, a French civil court sided with Pohl’s lawsuits against the Chambre Syndicale and Citroën.³³⁹ The implications of the ruling were clear: Japanese pearls could not be called fakes. In Paris, American consul Charles D. Westcott saw a clear victory for pearl cultivation:

Cultured pearls are no longer distinguishable in perfection of form and lustrous beauty from the natural gem. Their chemical composition also is identical. Hence production of the former upon a commercial scale by Japan, after thirty years of scientific development, has become a controlling factor in the world trade of which Paris is the distributing center.³⁴⁰

Yet even as French courts ruled that cultured pearls were not false pearls, the Chambre Syndicale-affiliated trade journal *La Perle* pointed out that judges had not tackled the relative position of natural and cultured pearls: “the question of how cultured pearls from Japan are to be sold has not caught the attention of the judge and, therefore,

³³⁷ Lucien Pohl to Hugues Citroën, 26 January 1922. Box L’Huître Perlière I-Z, Bibliothèque de Malacologie, MNHN.

³³⁸ To Tribunal Civil de la Seine, probably 1922. Bibliothèque de Malacologie, MNHN.

³³⁹ *Jugement rendu le 24 mai 1924 par le Tribunal Civil de la Seine* (Thiron, 1924).

³⁴⁰ Charles D. Westcott, “Cultured Pearls in the World Market, 31 October 1924, in Gemological Institute of America Library, Carlsbad, California (GIA).

any merchant who believes he can sell this product without reserve makes a serious mistake in believing that this is covered by the ruling."³⁴¹

Knowing Pearls Inside and Out

With the preceding debates over the relationship between “Japanese” pearls and “imitation” pearls in mind, we are now in a position to retrace how newly arriving round pearls from Japan became objects of dispute alongside “fine” pearls from 1921 onward. Among the earliest to latch onto the comparability of “natural” and “Japanese” pearls was the zoologist and fisheries official H. Lyster Jameson, who addressed the implications of the Japanese pearl in the 26 May 1921 issue of the journal *Nature*:

Apart from the purely financial question as to the degree to which the advent of artificially induced pearls is likely to affect the price of natural pearls,” Jameson wrote, “two questions seem to have been agitating the public: Are these products “pearls”? and Can a test be devised by which, without destroying them, they can be distinguished from pearls of natural origin?”³⁴²

Both questions remained live ones in the years immediately following the first reports of “Japanese” pearls.

1. *Are these products “pearls”?*

Jameson saw that different groups of people had different priorities when it came to categorizing pearls:

The trade distinguishes different kinds of pearls according to shape and size (fine pearls, baroque pearls, seed pearls, etc.), just as biologists distinguish certain classes according to where they arise (parenchyma or mantle pearls, muscle pearls), or to the kind of shell material of which they are composed (nacreous pearls, columnar pearls, hypostracum pearls, penostracum pearls, hinge

³⁴¹ “Avis Important à nos Lecteurs,” *La Perle* v. 1 n. 10 (15 Nov. 1924).

³⁴² H. Lyster Jameson, “The Japanese Artificially Induced Pearl,” *Nature* 107, no. 2691 (26 May 1921), p. 396.

pearls). All these classes, some valuable, some worthless, are, from the biological point of view, pearls.³⁴³

In this formulation, participants in “the trade” limited the scope of what counted as a pearl, while a biological perspective allowed for a more encompassing definition. These were broad strokes to be sure, but Jameson’s groupings fell along a key fault line in Paris’s legal debates over “Japanese” pearls.

How *did* “the trade” know pearls? Evaluation of form and surface was essential to the pearl trader’s tasks of buying and selling, but many sought to find out more about the relationship between a pearl’s inner qualities and its appearance. Their vantage point was from the outside looking in. Two Dutch emigrés to London included the following piece of advice as a footnote to their 1778 volume *Museum Britannicum*, an illustrated guide to selected holdings of the British Museum:

How to know good pearls. - To discover the hidden Defects and Faults of a Pearl, and to know whether she is speckled, or broken, or has any other imperfection, the best way is, to make a trial of it by the Reverberation of the Sun-beams; for by this means your eye will penetrate into the very Center of the Pearl, and discover the least defect it has; you will then see whether it be pure, or have any spots or not, and consequently you may the better guess at its value.³⁴⁴

These words had practical value over a century later in *The Book of The Pearl* (1908), where Tiffany’s George Frederick Kunz reprinted the footnote and provided a substantial *explication de texte*.³⁴⁵ Proper light conditions were considered necessary in

³⁴³ H. Lyster Jameson, “The Japanese Artificially Induced Pearl,” pp. 397-398.

³⁴⁴ John and Andrew van Rymsdyk, *Museum Britannicum* (London, 1778), p.8. Cited with slight editing in George F. Kunz and Charles H. Stevenson, *The Book of the Pearl: Its History, Art, Science and Industry of the Queen of Gems* (New York: The New York Century Co., 1908), pp. 370-371.

³⁴⁵ “If you can cause a ray of sunlight or of electric light to fall on a pearl, the light will penetrate it and show

order to examine a pearl. Even the best-looking pearl could hide imperfections that might reveal themselves at an inopportune moment. Its price might rise significantly as its size increased and its roundness improved. In France and in England, pearls generally sold at prices that could be expressed as an exponent of their weight in grains multiplied by a variable factor that accounted for their surface qualities. A pearl with a high degree of iridescence and limpidity, often characterized as the “orient” or “water (*eau*)” of the pearl, could fetch sums up to one hundred times more than a simple squaring of its gross weight.

For zoologists (including Kunz’s *Book of the Pearl* co-author, fisheries official Charles H. Stevenson), knowing pearls had long meant the study of a pearl’s cross-section. To know for sure, the naturalist had to cut. Since at least the early eighteenth century, investigators working to crack the innermost secrets of pearls had relied on observations of split-open specimens. In 1717, Réaumur published a study of pearl formation based on researches he had conducted the previous year off the coasts of France. His paper, large parts of which ended up in the entry for “Perles” in Diderot’s *Encyclopédie*, would go on to receive acclaim for its verification of the claim that pearls were formed from the same material as the shell itself. Réaumur pressed the point that both shell and pearl were formed from sequential deposits of material, which meant that a pearl, with its lustrous exterior, was an inside-out version of a shell, with its mother of pearl interior. Using a metaphor lifted from the Roman natural historian Pliny, Réaumur

any specks, inclosed blemishes or impurities...,” in Kunz and Stevenson, *The Book of the Pearl*, p. 371.

likened a pearl to a concentrically-layered onion.³⁴⁶ In 1850s Hamburg, Karl Möbius cut open dozens of pearls in an investigation into the causes of pearl formation. Along with earlier work published by the Italian naturalist Filippo de Filippi, Möbius found that, contrary to claims that a pearl grew from an inanimate irritant such as a grain of sand, tiny worm-like creatures were often sealed inside.³⁴⁷

By the end of the First World War, zoologists and fisheries officials across the early twentieth century world were effectively in agreement about the origins and mode of formation of the thousands of spherical pearls whose internal anatomies they had observed. First, a round pearl originated from the introduction of a foreign body, most often a parasitic organism, which penetrated the epithelial mantle tissue that surrounded the shellfish's soft body. Second, the pearl formed from mother-of-pearl that was secreted, layer-by-layer, by a localized area of mantle tissue that had traveled inward along with the foreign body and surrounded it to form a vesicle. Third, and perhaps most crucially, no particular object—whether sand, or nematode, or surgically inserted polished clamshell sphere—was necessary to start the process of spherical pearl formation. As zoologists like Jameson saw it, the vital step was the movement of a portion of the shell-secreting mantle tissue to form a “pearl sac” inside the soft body of a mollusk.³⁴⁸

³⁴⁶ de Réaumur, “Observations sur le Coquillage appelé Pinne Marine, ou Nacre de Perle; à l’occasion duquel on explique la formation des Perles,” *Histoire de l’Académie Royale des Sciences, Année 1717* (Paris: Imprimerie Royale, 1719).

³⁴⁷ Lynn K. Nyhart, “Civic and Economic Zoology in Nineteenth-Century Germany: The “Living Communities” of Karl Möbius,” *Isis* 89, no. 4 (December 1998), pp. 616-619.

³⁴⁸ H. Lyster Jameson, “The Japanese Artificially Induced Pearl,” *Nature* 107, no. 2691 (May 26, 1921).

2. *Knowing Without Cutting*

If pearl dealers claimed to be experts at evaluating a pearl's outermost appearance, zoologists saw themselves as people qualified to speak about the pathways by which that appearance had formed. Jameson's question about whether it would be possible to know a pearl without cutting hinted at whether pearl dealers and biologists could agree on what a pearl was, either from outside in or from inside out. In Paris and London, both ways of knowing were put to the test.

Between November and December of 1921 Mikimoto's London representative, Samuel Jones, went to court against another British seller who, operating under the vaguely Japanese-sounding alias "O. Toshimo," had placed advertisements offering glass pearls as Japanese cultured pearls. As the trial proceeded, Jones and his attorney attempted to show not only that a Mikimoto pearl was not an "imitation" glass pearl, but that it was no different from any other "natural" one. As time went on, testimony in the case moved away from the details of the false advertising charge against the glass pearls purveyed by "O. Toshimo" and crept toward discussions about the distinguishability of different kinds of pearls that came from shellfish.

At this turn of events, Edward Hopkins of the London Chamber of Commerce's Diamond, Pearl and Precious Stone Trade Section decided to hold a public demonstration of a pearl test using ultraviolet light. On November 17, 1921, with reporters and pearl experts including British fisheries official H. Lyster Jameson looking on, Hopkins put several "cultured" and "oriental" pearls under the light. Afterwards Hopkins split open

the tested pearls for all to see. It was at that moment when observers noted a flaw with the test: all of the “natural” Japanese pearls had glowed just as much as the “cultured” ones. One of those present was Alfred Frederick Calvert, a witness for the Mikimoto representative’s legal counsel A. W. Elkin. Calvert testified in court that, having seen the test, “it was impossible by any process to show any difference between Japanese real and Japanese cultured pearls except but cutting them open.” The headline in the *Daily Mail* article simply read, “Pearl Test Defied by Cultured Gems.”³⁴⁹

Other suggestions circulated in France. In early 1922, Fernand Ryziger and engineer Jean Galibourg introduced a test for drilled pearls in front of both the Académie des Sciences and the Chambre Syndicale.³⁵⁰ The test used mercury poured into a drilled pearl’s hole in order to make a column with a convex meniscus. With a light shining in from above the mercury-filled hole, the meniscus could in principle be used as a tiny mirror in order to see differences between the nucleus and the outer layers of the pearl. “I am assured by one of the great pearl dealers that they are perfecting an apparatus whereby, within a few weeks, they will be able positively and absolutely to distinguish a Cultured Pearl from a natural pearl,” wrote one dealer early in 1921. “All fear and anxiety in regard to this matter should disappear for, in reality it is unfounded.”³⁵¹

Amid rumors of a definitive French pearl test, Mikimoto’s Paris agent Lucien Pohl

³⁴⁹ 2 December 1921, Trade Section Minute Book 1921-1927, in LMA.

³⁵⁰ J. Galibourg and F. Ryziger, “Sur une méthode permettant de reconnaître les perles japonaises cultivées,” *Comptes rendus hebdomadaires de l’Académie des Sciences* (10 April 1922), 1012-1014.

³⁵¹ “Some Truths Regarding Japanese Cultured Pearls,” *Le Grand Négocier* v. 1 n. 11 (April 1922), p. 2.

attempted to settle the problem of distinguishing Japanese pearls. In June, a certain Jean d'Orsay wrote an article in *Le Matin* outlining a proposal for a public test involving “the two parties” in the pearl debate. The proceedings were to be held “under conditions of impartiality, fairness, and absolute rigor.”³⁵² Louis Joubin, the successor to Lamarck's chair at the Museum of Natural History, had already agreed to oversee the proceedings. According to the terms presented to the Chambres Syndicales of wholesalers and goldsmiths and published in the newspaper, a “jury”—composed of both naturalists versed in “pearly questions” as well as jewelers—would assemble mixed lots of cultured and natural pearls. The two Chambres Syndicales of wholesalers and goldsmiths would choose one or several experts, who were to be “designated by those who believe in the possibility of discerning *perles naturelles* from *perles cultivées*.” The experts could use any method they wanted to distinguish the pearls—with the sole stipulation that they leave the pearls intact. Afterwards, there would be a final moment of judgment when the pearls would be cut open. The jury, though not the pearl identifiers the dealers selected, would have known in advance how the test pearls had been labeled, but “after the experiment and if a necessity existed—for relieving all doubts—someone would destroy the pearls on hand in order to examine their cores.”³⁵³

Pearl wholesalers had not taken up the offer a year later, even as dealer Léonard Rosenthal mentioned in the trade journal *Le Grand Négocé* that dealers already possessed

³⁵² “Peut on, oui ou non distinguer les perles naturelles des perles cultivées?” *Le Matin* (30 June 1922).

³⁵³ “Peut on, oui ou non distinguer les perles naturelles des perles cultivées?”

more than one way of identifying cultured pearls: “ordinary methods” involving the expert’s “trained eye” (*l’œil exercé*), as well as “scientific methods.” In any event, more methods would be added to those that were “already present and sufficient.”³⁵⁴ Several months later, Lucien Pohl published a letter in *Le Grand Négoce* in order to respond directly to Rosenthal’s claims that cultured pearls were distinguishable from natural ones. If Rosenthal thought a sufficient method of distinction was already possible, Pohl asked, “Why did he not accept the offer for an experiment, made by the *Matin* on June 30th, 1922, or, better still, take up the 500,000 franc bet I launched through an intermediary in several papers? Why does he not then demonstrate in a decisive manner that his trained eye is infallible?” Pohl offered to sell Rosenthal the best specimens chosen from among his personal supply of Mikimoto pearls under the label of *perles fines*. “I defy him to have me condemned,” said Pohl.³⁵⁵

Pearl Testimony

In the absence of an accepted public demonstration of a non-destructive test, Pohl and the Chambre Syndicale both enlisted experts to testify about pearls on their behalves.

Lucien Pohl looked to zoologists, in particular Louis Boutan. Boutan, who had delivered a report on the Japanese pearl to the French Académie des Sciences in

³⁵⁴ “Tribune Libre,” *Le Grand Négoce* 3, no. 27 (August 1923). Rosenthal may have been referring here to the fact that the Ryziger-Galibourg test was designed for pearls that already had a hole drilled through them, not undrilled round pearls.

³⁵⁵ “Tribune Libre,” *Le Grand Négoce* 3, no. 29 (October 1923), emphasis in the original French.

November 1921, soon thereafter began corresponding directly with Lucien Pohl. Whereas the Chambre Syndicale had insisted that a *perle japonaise* was not, under any circumstances, a *perle fine*, Boutan reiterated to Pohl his favorable opinion of pearl cultivation: “In my study I have arrived at this conclusion: that spherical cultured pearls from Japan cannot be distinguished, from the point of view of their surface qualities, from natural pearls from Japan.”³⁵⁶

Boutan argued that the appraisal of fine pearls might be compared to the judging of fine wines. From the *grand expert* to the *fin connaisseur* to the run-of-the-mill merchant, a hierarchical array of taste coexisted in both the pearl and the wine industries. But as Boutan noted, the pearl expert and the wine expert classified different things. The wine expert dealt in questions of provenance, neatly compartmentalized by the origin of the wine and the year of its bottling. Each vintage could exhibit characteristic qualities to the trained palate. Those qualities appeared equally in the vintage of a given year. For the pearl expert, on the other hand, pearls from the same fishery had characteristics “as different as those of wines from Bordeaux and Bourgogne.”³⁵⁷ As such, Boutan wrote that provenance should play no significant role in the appraisal of pearls:

It requires no knowledge of diverse origins and provenances, nor *a fortiori* the year of production. It is of an entirely separate order and consists of this: Knowing, better than the rest, thanks to long studies and repeated experiences, to appraise the characteristics of the fine pearl which, as we have seen...reside uniquely in certain surface qualities.³⁵⁸

³⁵⁶ Louis Boutan to Lucien Pohl, 14 January 1922. Lucien Pohl papers (LP), in author's possession; Boutan's initial study was *Étude sur les perles fines: et, en particulier, sur les nouvelles perles complètes de culture japonaise* (Paris, 1921).

³⁵⁷ Louis Boutan, *La Perle: Étude générale de la perle, histoire de la méléagrine et des mollusques producteurs de perles* (Paris: G. Doin, 1925), p. 84.

³⁵⁸ Louis Boutan, *La Perle*, p. 85.

Boutan's conception of how pearl dealers bought and sold pearls emphasized exteriors over interiors—in his view, the identical surface appearances of cultured pearls and natural ones made them essentially equivalent. A pearl appraiser who overstepped these boundaries and tried to specify the exact provenance of the pearls he examined would “leave his expert role and risk becoming a charlatan, because neither he nor anyone will be able to verify his assertions.”³⁵⁹ In the absence of cutting, Boutan saw no way for anyone to trust claims about the inner structure of a pearl. For Boutan, the scientific savant and the pearl appraiser thus had two very different functions, because they handled pearls in different ways.

Boutan's theory of value found a legal venue in a case brought against Pohl and a go-between named Silbermann by a member of the *Chambre Syndicale* named Fischhoff. Fischhoff claimed that Silbermann had sold him two necklaces containing Pohl's cultured pearls. On July 1st, 1924, the court asked Boutan and Sorbonne biologist Etienne Rabaud to give expert opinion on the two necklaces. The pair's response to the court's second question encapsulated the zoologist's perspective:

Question 2. Were these pearls obtained by culture or are they real pearls?

Answer 2. This question is obviously intended to set cultured pearls against pearls formed accidentally. (a) All real accidental pearls, or so-called natural pearls, have not necessarily the same internal formation. (b) Sometimes their centers are composed of a small vacuum, again by a grain of sand, but most frequently by a parasite known as *Gastode* larva. This does not prevent them, however, from being considered real pearls as determined by their external perfection of form and lustrous beauty. Hence the nucleus or center is not a factor in the premises. (c) In the formation of both accidental and cultured pearls the decisive factor is the secretion of the external pallial epithelium of the mantle. The nucleus center, nucleus or germinal sack is merely a stimulating though necessary accessory. The concentric layers of pearly secretion are not affected directly or

³⁵⁹ Louis Boutan, *La Perle*, p. 85.

indirectly by the composition of the center. (d) All the large pearls in the necklaces are cultured and ten smaller are uncultured gems, but they are indistinguishable from each other. (e) Cultured pearls therefore are entitled to be considered real pearls and are so classified.³⁶⁰

In short, Boutan saw a pearl's value as an ornamental value, one that had no essential relationship to its internal structure. Asking whether a pearl was cultured *or* real was, for Boutan, not an either-or proposition.

To the Chambre Syndicale's Léonard Rosenthal, Boutan had failed to account for differences in the iridescence of a natural and a cultivated pearl. Boutan had "completely neglected that which appears to the trained eye of the expert." Rosenthal charged that Boutan's pronouncements of surface indistinguishability ignored the play of light off a pearl's inner layers. Faced with a problem of identification, Boutan had, oversimplistically, "solved it as would a chemist: identity of the elements, identity of the object."³⁶¹ Rosenthal maintained that the pearl dealer's "trained eye" could find faults in any equivalences that zoologists ascribed to natural and cultured pearls.³⁶²

Nevertheless, in Fischhoff's case against Pohl and Silbermann (and in subsequent trials along similar lines), Rosenthal and other members of the Chambre Syndicale backed off from engaging in battles over the connoisseurship of a pearl's surface. Instead, Léonard Rosenthal helped to recruit a range of experts who might reinforce the anti-Pohl pearl dealers' consensus that a Japanese pearl was merely "a small ball of pearly material

³⁶⁰ Charles D. Westcott, "Cultured Pearls in the World Market, 31 October 1924. Gemological Institute of America Library, Carlsbad, California.

³⁶¹ Léonard Rosenthal, *Au Royaume de la Perle* (Paris: Payot, 1926), p. 212.

³⁶² Léonard Rosenthal, *Au Royaume de la Perle*, pp. 212-213.

that has the external appearance of a true pearl, nothing else.”³⁶³ He found voice for such testimony among Paris’s academic chemists, physicians, mineralogists, and geographers.

During the fall of 1924, Rosenthal gathered letters supporting distinctions between natural and cultured pearls from Alfred Lacroix, director of the Paris Natural History Museum’s mineralogy section; the physiologist Charles Richet; the physical scientist Daniel Berthelot; the chemist Georges Urbain; and the physical geographer Louis Gentil. Lacroix and Urbain in particular cited the cultured pearl’s internal structure as evidence that it differed from natural ones. Key to their diagnosis was the presence of an inserted nucleating object. Lacroix stressed that “the chemical composition of the nucleus is, it is true, the same that which envelopes it, but its structure is different. The nucleus is not formed from concentric layers: it is, from the start, a foreign body.”³⁶⁴ Lacroix argued that a *perle fine naturelle* and a *perle cultivée du Japon* could not, “from a commercial standpoint,” be sold under the same name, precisely because “the center of a Japanese pearl has no value whatsoever.”³⁶⁵ Urbain syllogized that “the *perle japonaise* is to the *perle fine* as a gold-plated metal is to solid gold.”³⁶⁶ All echoed Sorbonne geographer Gentil in saying that selling all kinds of pearls under the same name would be disastrous for the trade: “Such a fraudulent sale must be considered as a swindle and the penalties must be all the more severe, as there will be greater difficulties in distinguishing between

³⁶³ Léonard Rosenthal, *Au Royaume de la Perle*, p. 209.

³⁶⁴ Léonard Rosenthal, *Au Royaume de la Perle*, p. 216.

³⁶⁵ Léonard Rosenthal, *Au Royaume de la Perle*, p. 217.

³⁶⁶ Léonard Rosenthal, *Au Royaume de la Perle*, p. 219.

two pearls of which one is natural and the other Japanese.”³⁶⁷

Answering the questions of what a pearl was, and how one would know what a pearl was without cutting it, divided Pohl’s camp from the Chambre Syndicale’s camp. If zoologists claimed to see a range of variation inside pearls, dealers claimed to pick out a similar range of variation on a pearl’s surface. The zoologists’ cutting method offered one answer, but cutting also had a glaring drawback for the dealer, as it was a surefire way to destroy one’s stock-in-trade. Yet from 1924, the Chambre Syndicale and Pohl’s expert witnesses both found themselves arguing about evidence gained from cross-sectioned pearls. Determining the relationship between the center of a pearl and its label became central to the question of commercial classification.³⁶⁸

Dividing Nature from Culture in Court

The Chambre Syndicale’s members made the internal structure of a pearl into a question of market order by claiming that Lucien Pohl had misled them into purchasing items they had not intended to buy.

The first case emerged from an incident in January 1924, when Lucien Pohl had given a go-between (*courtier*) named Silbermann a strand of twenty-seven pearls.³⁶⁹ Silbermann showed the strand to a Chambre Syndicale member named Moussaïeff. As

³⁶⁷ Léonard Rosenthal, *Au Royaume de la Perle*, pp. 219-220.

³⁶⁸ For more on scientific testimony outside a civil law context, see Tal Golan, *Laws of Men and Laws of Nature: The History of Scientific Expert Testimony in England and America* (Cambridge, MA: Harvard University Press, 2004).

³⁶⁹ The Fischhoff case would come to court not long afterwards.

was common practice, Moussaïeff offered a price calculated to be ninety times the combined squared weight of the pearls in grains, an offer of around fifty thousand francs. Pohl directed Silbermann to accept the offer. The next day Moussaïeff wrote to Silbermann, saying that “We have discovered that the pearls you said were guaranteed not to be Japanese pearls are indeed Japanese pearls. The transaction must be considered null and void. I do not even know from which house these pearls have come, as you asked for the invoice not to say the name of the house. You are therefore solely responsible for this sale.”³⁷⁰ Pohl replied to Moussaïeff directly to tell him he was the supplier of the strand. Pohl refunded the money but, as Moussaïeff would later stress, Pohl described the article on the invoice simply as a strand of “*perles*.” Moussaïeff brought the affair to Paris’s Tribunal de Commerce.³⁷¹

Nearly a year later, in January 1925, the Tribunal de Commerce found Pohl and Silbermann guilty. Judges in the current case noted, in line with the zoologists and with Pohl’s 1924 judgment, that cultured pearls had essentially the same surface appearance as any other natural pearl. For the first time, however, a court decided that a cultured pearl and a natural pearl of the same size and weight did not have the same value. The ruling held that, while a cultured pearl might possess layers of pearly material, the large volume taken up by its nucleus made it structurally distinct from other pearls.

Moussaïeff argued that buyers bought not only the surface of a pearl, but the total mass of its accumulated layers. Everyone in the trade bought and sold pearls by their

³⁷⁰ “Jugement dans l’affaire Pohl-Moussaïeff,” *Le Grand Négocier* v. 4 n. 58 (Feb. 1925).

³⁷¹ “Jugement dans l’affaire Pohl-Moussaïeff,” *Le Grand Négocier*.

weight in grains—Moussaïeff had himself bargained for Pohl's pearls based on their weight. But with a cultured pearl, a buyer would not be getting as much pearl matter as he or she bargained for.³⁷²

Judges had not, however, ordered any close study of the pearls at stake in the case. The ruling admitted that Pohl's reputation as a purveyor of Mikimoto pearls had weighed heavily in its decision.³⁷³ The court returned to the problem of cutting and knowing: "While it is true that no specific evidence that the disputed pearls are cultured pearls is reported by Moussaïeff, such evidence is only possible by the examination of the nacre nucleus—examination that necessarily involves the destruction of the pearls."³⁷⁴ The court had, more or less, taken Moussaïeff's word that he had found the pearls to be cultivated.

The *courtier* Silbermann soon protested the ruling. As a professional go-between, he claimed that his reputation in the trade was predicated upon trusting both sides in any transaction, regardless of the products a seller had sold in the past. He decried what he saw as the "simple syllogism" that had led Moussaïeff to charge Pohl with fraud: "Pohl sells cultivated pearls; I learn that the pearls I have just purchased are from him; thus these are cultivated pearls."³⁷⁵ Mikimoto's head sales manager Ikeda Kakichi, who had

³⁷² The court also accepted the *Chambre Syndicale*'s widely held complaint that a thinner coating of pearl material had practical disadvantages if one wanted to undergo the common process of having the outer layers of a pearl taken off in order to reveal more pleasing layers underneath.

³⁷³ "Pohl is notorious in the precious stone trade as an importer of cultivated nacre pearls." In "Jugement dans l'affaire Pohl-Moussaïeff," *Le Grand Négoce*.

³⁷⁴ "Jugement dans l'affaire Pohl-Moussaïeff," *Le Grand Négoce*.

³⁷⁵ Letter from B L Silbermann, *La Perle* v. 2 n. 4 (25 March 1925), p. 16.

arrived in Europe two years prior in order to stay abreast of the trials, expressed dismay at the success of the *Chambre Syndicale*'s expert witness strategy. "Upon looking at those who have submitted opposing opinions I find that all of them are chemists or mineralogists; none of them are pearl experts (*shinju gakusha*)," Ikeda wrote to the Japanese ambassador to France. "Their arguments likewise make no mention of the principles of pearl formation."³⁷⁶

Members of the *Chambre Syndicale*, by contrast, seized on the newfound legitimacy of their claims that a *perle cultivée du japon* was something apart from other *perles fines*. Pearl dealer Jacques Bienenfeld said in no uncertain terms that selling a cultured pearl without noting its cultured character was fraud. The reason was that pearls were not simply decorative items. They possessed "real value" (*valeur réelle*) that would allow the buyer to recoup the money spent on them at some later date.³⁷⁷

In July 1925 the *Chambre Syndicale* gained new powers over domestic pearl policing. Eugène Roux, the Ministry of Agriculture's Director of Sanitary and Scientific Services and the Repression of Frauds, named three members of the *Chambre Syndicale* as "Agents of Fraud Repression."³⁷⁸ Roux's directive empowered deputies from the *Chambre Syndicale* to "apply the law of 1 August 1905 to sales of diamonds, pearls, and

³⁷⁶ Ikeda Kakichi to Ambassador Ishii, January 1925. Accessed through the Japan Center for Asian Historical Records (JACAR). Reference Code B11100934200, p. 3.

³⁷⁷ Jacques Bienenfeld, "Pourquoi on doit considérer comme tromperie la vente des pierres à noyau étranger (japonaises), sans indication de leur nature," *La Perle* v. 2 n. 8 (25 May 1925), p. 2.

³⁷⁸ *Recueil Mensuel des Procès-Verbaux des Séances de la Chambre Syndicale des Négociants en Diamants, Perles, Pierres Précieuses et des Lapidaires*, no. 81 (June-July 1925), 1350. The agents were René Bloch (who would become a purveyor of the pearl testing endoscope, to be introduced shortly), Marcel Vite-Weill, and Jean Goujon.

precious stones,” which in practice meant that agents could seize what they considered to be fraudulently labeled pearls.³⁷⁹

In the wake of the ruling against Pohl and the deputization of fraud repression agents from the *Chambre Syndicale*, Mikimoto expressed mixed feelings about how things had come to pass. Mikimoto had expressly given Pohl a free hand to deal with the *Chambre Syndicale* since early 1921.³⁸⁰ But he began to hint to Japanese government officials that Pohl had gone too far in his legal manoeuvring and sales tactics. Mikimoto suggested by contrast that he had always wanted to publicize his patented methods, not agitate for his products to be labeled the same as other pearls. Nevertheless, Mikimoto reiterated his support for the idea that cultured pearls and natural pearls, even if sold under different names, had the same functional and aesthetic qualities. In particular, Mikimoto bristled at the idea that the “Japanese” provenance of a cultured pearl might have to be made explicit on all shipments. As Mikimoto and others implied, if non-cultivated pearls, whether from Venezuela or from Bahrain, could be strung together into what European buyers called “Bombay bunches” and labeled simply as “Oriental” pearls, why did dealers in “Japanese” pearls have to specify where their products came from?³⁸¹

³⁷⁹ *Recueil Mensuel des Procès-Verbaux des Séances de la Chambre Syndicale des Négociants en Diamants, Perles, Pierres Précieuses et des Lapidaires* (June-July 1925), p. 1350.

³⁸⁰ Katō had informed the *Chambre Syndicale* on Mikimoto’s behalf that Pohl had the power to operate as he saw fit: “In the matter of pearls imported from Japan, of which I am the principal producer, I beg you to note that I am giving full powers to Mr. L. Pohl, 4 rue d’Hauteville, Paris, to make an agreement with you in our mutual interest.” Letter from T. Kato to Lucien Pohl, 30 April 1921. Lucien Pohl papers (LP), in author’s possession.

³⁸¹ Copy of “déposition de Monsieur Dollfus Robert Ph. 38 ans, préparateur aux Hautes Etudes, devant Monsieur Krug-Basse, Juge d’Instruction en date du 4 Avril 1925,” Robert Dollfus Papers, Bibliothèque de Malacologie, MNHN. In England Mikimoto’s agent Samuel Jones later reiterated a similar argument about

For Mikimoto, the opinion established by the 1925 ruling was “a discriminatory position toward Japanese cultured pearls.”³⁸²

Even so, the January 1925 ruling was the first anywhere in the world to admit that a legal distinction existed between natural and cultured pearls based on a pearl’s internal structure. Judges accepted Moussaïeff’s claims—claims mirroring those advanced by the *Chambre Syndicale*’s expert team of Lacroix, Richet, Berthelot, and Urbain—that the presence of a nucleus created pressing commercial reasons for separating, and even testing, natural and cultured pearls.

Machines and Mediation

Pearl dealers looked for a foolproof method to check the center of spheres that were iridescent on the surface but increasingly opaque as one attempted to peer deeper within. The months between late 1924 and the early 1926 were a watershed in efforts to identify cultured pearls through the use of non-destructive pearl tests. Paris became the center for the development of pearl testing instruments, but instruments soon spread to London and beyond.

Machine-mediated tests operated on the growing consensus that the center of a pearl—or more precisely, the presence or absence of an implanted mother-of-pearl nucleus—was the key criterion with which to assess the presence or absence of man-made

lax standards of provenance for non-cultivated pearls. See Samuel L. Jones, “A Talk on Cultured Pearls,” *The Watchmaker, Jeweler, Silversmith and Optician* (June 1927).

³⁸² Mikimoto Kōkichi to the Japanese Foreign Ministry Trade Bureau, 27 August 1925. Accessed through the Japan Center for Asian Historical Records (JACAR). Reference Code B11100934200, p. 45.

artifice. The qualities of a pearl's center came to be points of considerable importance to those who hoped to distinguish between cultured and natural pearls. Mother-of-pearl nuclei were polished from chunky squares that had been cut from some of the thickest shells for sale. As such, they appeared upon close inspection as a stack of parallel layers, not the nested concentric layers that formed inside a pearl sac. Pearl test developers worked with the idea that electromagnetic radiation at different wavelengths—whether visible light, ultraviolet rays, or X-rays—would be expected to pass through pearls with different kinds of internal structures in measurably different ways.³⁸³

As he prepared to address a November 1925 conference presented to the Société d'Experts-Chimistes, Fernand Ryziger, in his new capacity as the head of the Chambre Syndicale's recently opened pearl testing laboratory, could point to a suite of instrumental methods which promised to reveal a pearl's implanted nucleus without cutting.³⁸⁴ Three of the instruments he showed—the lucidoscope, the X-ray diffraction unit, and especially the endoscope—were high-profile products of interwar technical collaboration between communities of physical scientists and pearl traders.

³⁸³ J. Galibourg and F. Ryziger, "Les Méthodes d'Examen et d'Étude des Perles Fines et des Perles de Culture," *Revue d'Optique Theoretique et Instrumentale* 6, no. 3 (March 1927), p. 126. For more on the relationship between machines and expert judgment, see Graeme J. N. Gooday, *The Morals of Measurement: Accuracy, Irony, and Trust in Late Victorian Electrical Practice* (Cambridge University Press, 2004); Ken Alder, *The Lie Detectors: The History of an American Obsession* (New York: Free Press, 2007); Keith Wailoo, *Drawing Blood: Technology and Disease Identity in Twentieth Century America* (Johns Hopkins University Press, 1999); Bernike Pasveer, "Knowledge of Shadows: The Introduction of X-Ray Images in Medicine," *Sociology of Health & Illness* 11, no. 4 (1989), pp. 360-381; Hughes Evans, "Losing Touch: The Controversy over the Introduction of Blood Pressure Instruments into Medicine," *Technology and Culture* 34, no. 4 (October 1993), pp. 784-807.

³⁸⁴ "Perles fines et perles de culture," *Annales des Falsifications et des Fraudes* v. 18 n. 203 (Nov. 1925), pp. 514-515.

The Lucidoscope

The Chambre Syndicale closely followed the physicist (and pearl expert witness) Daniel Berthelot's presentation of Bela Szilard's new pearl testing method at the Académie des Sciences.³⁸⁵ Szilard had come to Paris from Hungary as an experimental physicist. He worked for several years in Marie and Pierre Curie's laboratory and had lived in Spain during World War I.³⁸⁶ His "lucidoscope" used principles of oil immersion microscopy designed as such to increase the resolution of the object under study—and, it was hoped, to reveal structural differences between pearls based on the way light propagated through them.

A lucidoscope user first submerged a pearl in a liquid with roughly the same index of refraction as glass. Szilard preferred pure benzene, but cedar oil was a popular immersant for the lucidoscope, as it was for oil immersion applications more generally. An electric lamp placed underneath the submerged pearl provided illumination that, when passed through a condenser, was directed toward the pearl. It provided a way to check for the presence of a slightly denser implanted nucleus. When viewed through the lucidoscope's objective lens, cultured pearls would be expected to reveal a darker inner

³⁸⁵ Bela Szilard, "Nouvelle méthode d'examen de l'intérieur des perles," *Comptes rendus hebdomadaires des séances de l'Académie des sciences* (9 February 1925): pp. 433-436.

³⁸⁶ The definitive Hungarian biographical study of Szilard is Gabor Pallo, "Szilárd Béla tudományos életrajza," *Századok* (1981), pp. 770-798. See also Bernward Joerges and Terry Shin, *Instrumentation: Between Science, State, and Industry* (Springer, 2000), p. 59; Pallo, "Isotope research before Isotopy: George Hevesy's early radioactivity research in the Hungarian context," *Dynamis* 29 (2009), pp. 167-189.

sphere (corresponding to the mother of pearl core) surrounded by lighter outer rings (Figure 6).³⁸⁷

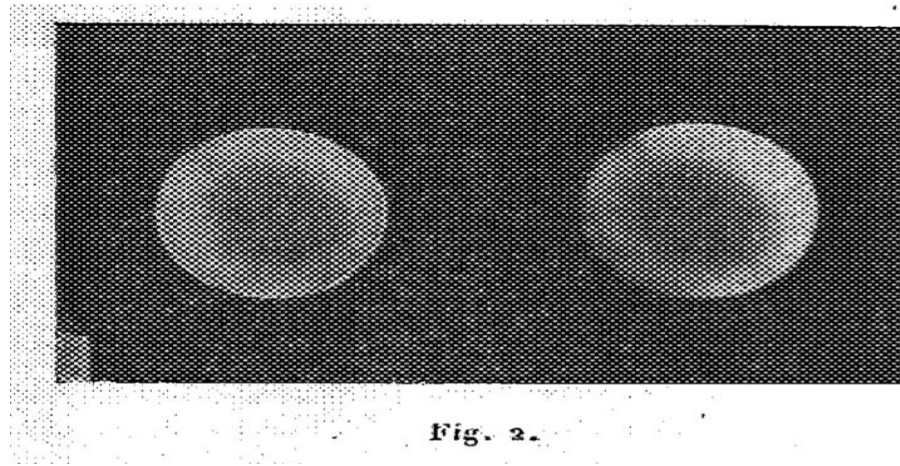


Figure 6. Lucidoscope images of two pearls with mother-of-pearl nuclei.³⁸⁸

X-ray Diffraction

Gem dealers and instrument makers in London struck upon the possibility of incorporating X-rays into a pearl test early after the cultured pearl question flared up. On May 26, 1921, the same day that H. Lyster Jameson's article on cultured pearls appeared in *Nature*, the British physicist William Henry Bragg replied to an inquiry from J. W. Mason of the firm X-Rays, Ltd. about the use of X-ray diffraction to detect pearls. Bragg senior, who played a relatively neglected role in the development of gemological techniques, was keenly aware of the possible industrial applications of X-ray technologies to questions of quality control and identification.³⁸⁹ Along with his son Lawrence, the British physicist

³⁸⁷ Bela Szilard, "Nouvelle méthode d'examen de l'intérieur des perles."

³⁸⁸ B. Szilard, "Nouvelle méthode d'examen de l'intérieur des perles," 435.

³⁸⁹ William Henry Bragg, *Old Trades and New Knowledge* (London, G. Bell and Sons, 1926). See David Berol, "Living Materials and the Structural Ideal: The Development of the Protein Crystallography Community in

William Henry Bragg had determined a method for interpreting the phenomenon of X-ray diffraction described by the German physicist Max von Laue in 1912 (for which they together received a Nobel Prize in 1915, the year after von Laue). In 1921, however, Bragg reported that “the examination of the cultured pearl by the ordinary method of von Laue gave no result within the time spent on it,” though he added that “the method is quite simple if you like to try it yourself.”³⁹⁰

X-ray diffraction found its first published gemological application in Paris. Jean Galibourg and Fernand Ryziger, developers of the mercury test for drilled pearls, recounted that a metals chemist at the École Centrale had told them about the testing potential of von Laue’s diffraction studies, which had showed the potential for crystalline substances to produce images with regular and distinct patterning.³⁹¹ They asked the physicist Alexandre Dauvillier, whose work in Maurice de Broglie’s laboratory had already resulted in a number of treatises on X-ray spectrography, to undertake a study of pearls with this principle in mind.³⁹²

In 1924, Dauvillier constructed a working forty-five kilovolt prototype of his pearl testing diffraction instrument, with which up to two pearls at a time could be exposed to

the 20th Century” (PhD diss., Princeton University, 2001), pp. 26-36.

³⁹⁰ William H. Bragg to X-Rays Limited, 26 May 1921, RI MS WHB 16E/2, held at The Royal Institute, London.

³⁹¹ J. Galibourg and F. Ryziger, “Les Méthodes d’Examen et d’Étude des Perles Fines et des Perles de Culture,” p. 127.

³⁹² Mary Jo Nye, “Aristocratic Culture and the Pursuit of Science: The De Broglies in Modern France,” *Isis* 88, n. 3 (1997), pp. 397-421.

X-rays for between ten minutes to an hour, depending on the pearls' sizes and other conditions. Dauvillier's own assessment of his technique was nothing less than dismissive of both previous testing efforts and the abilities of some pearl dealers to make visual identifications. He expressed doubt at the submersion of pearls in calibrated liquids to check the specific gravity of slightly denser cultured pearls, downplayed the effectiveness of Szilard's lucidoscope, and criticized the assumption that natural pearls would contain layers uniform enough to conduct light. All the while he promoted the effectiveness of X-ray analysis (Figure 7). "It seems then that none of the procedures enumerated above allow one to say for sure whether one is dealing with a natural or cultivated pearl, though they are able, to varying degrees, to furnish an interesting probability," wrote Dauvillier in 1926, more than a year after he had first presented his method of analysis. "We will see, by contrast, that the procedure based on the Roentgen diffraction ray test offers certainty and also gives precise information about the nuclear structure of natural pearls."³⁹³

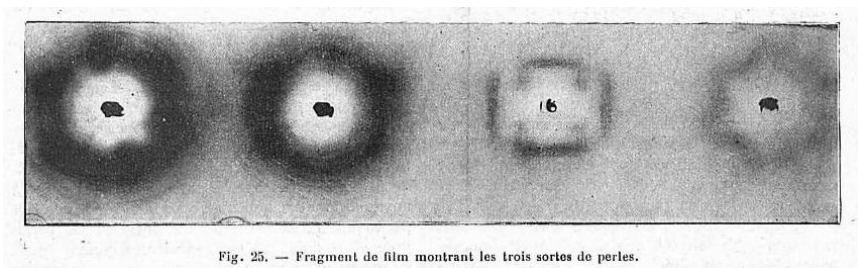


Figure 7. Four images of pearls obtained from Dauvillier's X-ray apparatus. Dauvillier did not label which images corresponded to which of the three types of pearl he introduced. This was something that the reader could (presumably) do with ease.³⁹⁴

³⁹³ A. Dauvillier, "Différenciation des perles naturelles et cultivées," *Revue des cours scientifiques de la France et de l'Étranger*, revue rose (1926), p. 41.

³⁹⁴ A. Dauvillier, "Différenciation des perles naturelles et cultivées," 43.

The Endoscope

*The whole thing forms a kind of needle for “injecting,” so to say, the light into the pearl...*³⁹⁵

On 26 October 1925, Jean Perrin presented a short paper at the Paris Académie des Sciences on behalf of his son Francis and another collaborator, Constantin Chilowsky.³⁹⁶ He announced that the younger Perrin and Chilowsky had developed an endoscopic instrument with a very specific purview: creating a distinction between gem-quality “fine” pearls and cultured ones (Figure 8).³⁹⁷ Francis Perrin had recently finished his studies at the Ecole Normale Supérieure and would later take up a position at the University of Paris. Chilowsky was a Russian émigré who had worked extensively with Paul Langevin on methods of sonar detection during the First World War.³⁹⁸ Their endoscope was introduced after the London ultraviolet tests, Galibourg and Ryziger’s mercury mirror test, Szilard’s lucidoscope, and Dauvillier’s initial X-ray diffraction method. It was a footnote to the proceedings of the Académie des Sciences, perhaps, but gem dealers in Paris and London had been waiting for the release of this instrument.

³⁹⁵ “Messrs. Chilowsky & Perrin’s Endoscope,” *La Perle* 3, no. 1 (January 1926), p. 3.

³⁹⁶ His surname is often rendered as Chilowski.

³⁹⁷ C. Chilowsky and F. Perrin, “Sur un nouveau procédé de distinction entre les perles fines et les perles cultivées,” *Comptes rendus hebdomadaires des séances de l’Académie des sciences* (3 November 1925), pp. 604-605.

³⁹⁸ See, e.g., Benoit Lelong, “Paul Langevin et la détection sous-marine, 1914-1929: Un physicien acteur de l’innovation industrielle et militaire,” *Epistemologiques* (2001), pp. 205-232.

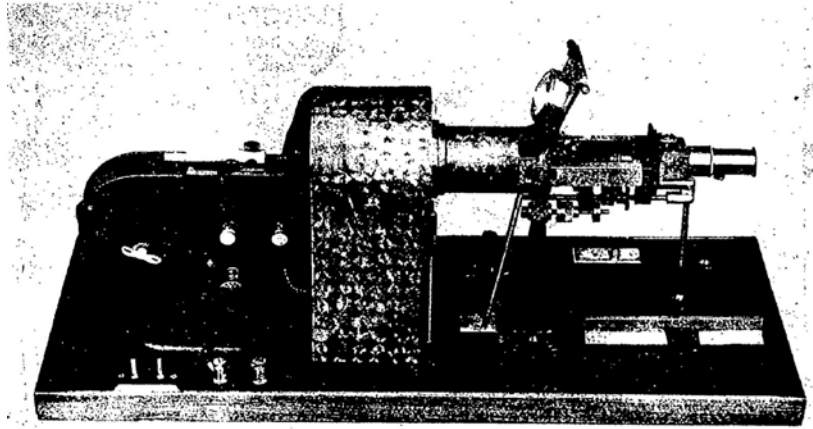


Figure 8. The Perrin-Chilowsky endoscope.³⁹⁹

The development of the endoscope had not come cheap. The “needle light,” as it had become known in London in the months prior to its unveiling, was the result of substantial investments from Paris’s pearl dealers. The Diamond and Pearl Section of the London Chamber of Commerce suggested that the *Chambre Syndicale* had contributed significantly towards Perrin and Chilowsky’s research on the endoscope, perhaps to the tune of 200,000 francs, and might not freely part with its secrets.⁴⁰⁰

The endoscope’s key feature was its hollow needle, through which a beam of light could be cast straight from an arc lamp at the rear of the setup. The tip of the needle contained two small mirrors set at opposing forty-five degree angles. An operator would sit so that he or she could look into the opening of the hollow needle. The operator could then take a drilled pearl and slide it gradually across the needle by pushing or pulling a

³⁹⁹ “Endoscope pour l’examen des perles (note des inventeurs),” 265.

⁴⁰⁰ 15 September 1925, Diamond, Pearl, and Precious Stone Trade Section Minute Book 1921-1927, CLC/B/150/MS16600/001, LMA.

lever that hung just beneath the eyepiece.

Perrin and Chilowsky designed their endoscope on the principle that the innermost layers of a natural pearl were concentric. Light sent through the hollow needle would hit the first mirror and be reflected upward into one of a pearl's layers. The entering light would reflect back-and-forth along the layer until reached the second mirror and, finally, exited from the other side of the hollow needle toward the operator of the instrument. A brief flicker of light thus indicated that the circuit had been made. The pearl could be considered "natural." On the other hand, no light implied that a pearl's center was something other than concentric (Figure 9).

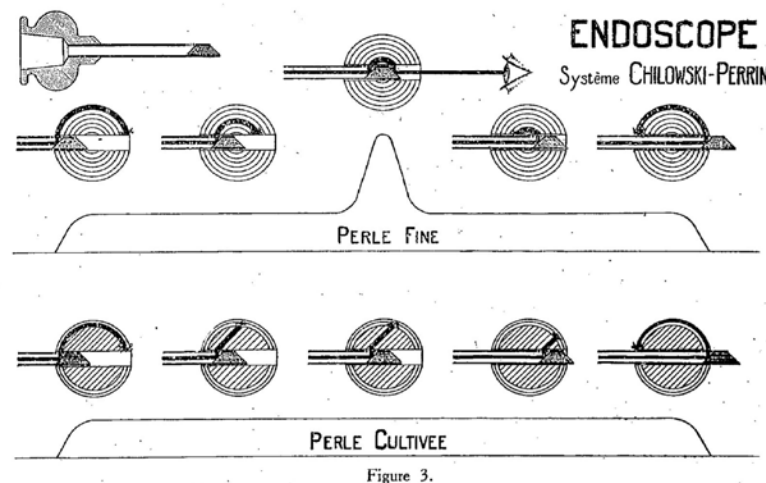


Figure 9. Schematic illustration of the Perrin-Chilowsky endoscope mechanism.⁴⁰¹

Although widely referred to as a "needle light" or "needle machine," the Perrin-Chilowsky instrument operated as a two-stage test. The first stage outlined above was designed to show whether the center of the pearl had a concentric structure. If light

⁴⁰¹ "Endoscope pour l'examen des perles (note des inventeurs)," 267.

passed through, an operator would move to the next pearl in the strand. If the light failed to pass through, the observer could move to the second stage to try to determine the structure at the center. In the second stage, the operator could look up from the needle to see the pearl's surface. If a pearl's core was composed of parallel and not concentric layers, light would be expected to exit from the side of the pearl, not out the other end of the needle. Thus, a band of light appearing on the side of the pearl would indicate that its center was composed of a parallel-banded implanted nucleus, not the concentric layers expected for a natural pearl.

The endoscope promised speed, ease of use, and reliability. Francis Perrin claimed that a skilled operator could examine one hundred to one hundred and fifty pearls per hour; Basil Anderson, the head pearl tester at the London Chamber of Commerce, later wrote that he and others had looked at two hundred per hour.⁴⁰² Yet the instrument also presented problems to users. Anderson recalled that the “the endoscope had a highly irregular circuit whereby the body of the instrument itself was ‘live,’ and could give rise to considerable electric shocks for the user if there was a direct current supply, unless insulated by a rubber mat.” Components had to be replaced regularly. Thin, hollow endoscope needles broke frequently. Filaments in the arc lamp burned out. The pearl stringer on the laboratory's staff, “who was a scared and reluctant learner, quickly broke the bulk of the delicate needles, and telephoned for help whenever the carbons of the arc

⁴⁰² “Nouvel appareil pour distinguer les perles de culture des perles fines,” *Recueil Mensuel des Procès-Verbaux des Séances de la Chambre Syndicale des Négociants en Diamants, Perles, Pierres Précieuses et des Lapidaires*, no. 92 (January-February 1927), p. 1565; Alexander E. Farn, *Pearls: Natural, Cultured, and Imitation* (London: Butterworths, 1986), p. 111.

lamp needed recharging.”⁴⁰³

Mediation

Testing was not just about detecting unwanted pearls. Dealers argued that testing was, at the same time, a way to reclaim trust among themselves.

Soon after the “faked pearl sensation” in 1921, one member of the London Trade Section’s Pearl Sub-Committee had suggested “that a Laboratory or Clinic be formed in connection with the Section—similar to the clinics existing in connection with the medical or other sciences—which could employ a scientist who would have all the necessary apparatus and would be readily able to decide the many questions which are cropping up from day to day not only re[garding] pearls but in practically every other precious and semi-precious stones.”⁴⁰⁴ By the end of 1925, the Paris Chambre Syndicale and the London Diamond, Pearl, Precious Stone Trade Section had both established pearl testing laboratories, in Paris at the premises of Fernand Ryziger and in London at a stand-alone office.⁴⁰⁵ Both laboratories housed instruments designed specifically to ascertain the presence or absence of a surgically-implanted mother-of-pearl nucleus. They supplied

⁴⁰³ B. W. Anderson, “1925...and all that,” *The Journal of Gemmology and Proceedings of the Gemmological Association of Great Britain* 13 (July 1973), p. 253.

⁴⁰⁴ 10 May 1921, Trade Section Minute Book 1921-1927. CLC/B/150/MS16600/001.

⁴⁰⁵ “Un laboratoire a été installé chez MM. Ryziger et fonctionne officiellement. Provisionnement, le prix d’examen des perles a été fixé à 1 franc par grain avec un minimum de 50 francs.” “Perles cultivées,” *Recueil Mensuel des Procès-Verbaux des Séances de la Chambre Syndicale des Négociants en Diamants, Perles, Pierres Précieuses et des Lapidaires*, no. 83 (November 1925), p. 1379.

a commercial service for members of the global trade in pearls. Many of the men (and women) hired to test pearls inhabited different spaces, came from different educational backgrounds, and filled sharply delimited roles than pearl dealers. Even as laboratories received funding from local gem trading communities, the practices of the gem tester came to be separated spatially, occupationally, and rhetorically from the vested commercial interests of pearl and precious stone dealers.

The Committee of the Paris *Chambre Syndicale* recommended the use of laboratory examinations in order to “avoid any conflict in the future.”⁴⁰⁶ Before disputes might reach a court of law, as they had in Paris with Lucien Pohl and the *Chambre Syndicale*, pearl testing laboratories were to serve as spaces in which judgments about the authenticity of merchandise could be ascertained. At first only members were eligible for testing services in Paris and London. In London, the buyer and the seller split the costs of testing unless a tests subsequently revealed a cultured pearl, in which case the seller would pay the full amount. In either case, testing took time: buyers and sellers had to wait “seven clear days” for a test.⁴⁰⁷

Nevertheless, many pearl dealers had to be persuaded that they needed to pass pearls and precious stones through laboratory facilities that added additional costs and delays. In Paris, the *Chambre Syndicale*’s secretary noted low interest in testing among

⁴⁰⁶ *Recueil Mensuel des Procès-Verbaux des Séances de la Chambre Syndicale des Négociants en Diamants, Perles, Pierres Précieuses et des Lapidaires de Paris*, no. 122 (October 1930), p. 2247.

⁴⁰⁷ Meeting, July 14, 1925, Diamond, Pearl, and Precious Stone Trade Section Minute Book 1921-1927, CLC/B/150/MS16600/001, LMA.

some of its members:

Even now there are times when a dealer writes: 'A laboratory? But why do that? We didn't have one before, and business was fine.' This dealer forgets one thing, and it is that there is an abyss between yesterday and today. The trade that does not adapt itself to the present conditions of life is doomed to a rapid decline. Yesterday, the precious stone and the treasure alone were offered to the public, so they did not have to be guarded against products likely to create confusion with them in customers' minds. Yesterday, the cultured pearl and the synthetic stone did not exist.⁴⁰⁸

Some found reasons for testing in appeals to protect "the public." Léonard Rosenthal suggested that the strongest reason for testing was to allay the public's concerns, not to prevent conflict among wholesale dealers. Even amid the introduction of machines which he had financed to a considerable degree, Rosenthal maintained the primacy of visual inspection, not the interpretation of machine-produced images, in the determination of a pearl's identity:

The Japanese pearl, as I said above, is almost always recognizable with the naked eye by a man in the trade, but to give the public the assurance to which it is entitled and the absolute certainty that is its security, a laboratory has been installed in the *Chambre Syndicale*. There, by five combined scientific processes, pearls considered doubtful are examined. "Les japonaises" are immediately recognized under conditions of absolute certainty. No doubt, however small it may be, can exist.⁴⁰⁹

The armature of pearl testing—laboratories placed at key points along the gathering and trade in natural pearls, gem testing machines designed to reveal the internal characteristics of pearls, and human gem testers trained to interpret those machines—together made possible attempts to police natural and cultured markets. But, along with identifying products, testing suggested ways to make distinctions among

⁴⁰⁸ Max Buteau, "Le service du contrôle des perles et pierres précieuses," *La Perle* 9, no. 2 (February 1932), p. 5.

⁴⁰⁹ Léonard Rosenthal, *Au Royaume de la Perle* (Paris: Payot, 1926), p. 214.

consumers. In particular, a public that sought to invest in “natural” pearls was different from a public that might otherwise prefer a less expensive object of adornment. Trade journals at times imagined female fears of having their cultured pearls brought to light by the new instrumental testing methods. “At heart, mesdames, you who own Japanese pearls have only to risk that a good friend says, ‘Let me see your pearls...I happen to have with me some cedar oil, an oil immersion objective, and an X-ray unit...’”⁴¹⁰ Testing was a means to inspire confidence in products, but it could also become a means to persuade hesitant consumers—especially female consumers—to choose something else.

Testing the Tests

In order to determine what machine-mediated output from a natural and a cultured pearl might look like, machines and pearls both underwent tests.⁴¹¹

In early 1925, Bela Szilard agreed to have his lucidoscope inspected by the Office National des Inventions. The Office turned to Robert Dollfus, a malacologist at the Paris Museum of Natural History, to provide them with an evaluation. As it turned out, Lucien Pohl was the man Dollfus looked to for supplies of pearl test specimens. Dollfus promptly acquired sixteen pearls from Pohl, who had an opportunity to judge the lucidoscope’s output from the test pearls alongside the split-open test pearls themselves.

⁴¹⁰ “On est parvenu à distinguer les perles naturelles des perles japonaises,” *Le Moniteur de la Bijouterie, de l’Horlogerie, de la Joaillerie et de l’Orfèvrerie* (May 1925), p. 22.

⁴¹¹ For more on the interrelationships between the standardization of instruments and objects used to calibrate instruments, see Jutta Schickore, “Test Objects for Microscopes,” *History of Science* 47 (2009), pp. 117–145.

Several months after Dollfus's test, Pohl wrote to Jacques Boyer that eight of the lucidoscope's sixteen test results had been either "uncertain or inexact."⁴¹² Pohl was also involved in tests of the X-ray diffraction method. As a test of a pearl's identity, X-ray diffraction served to check whether the photographic output of the test corresponded with previously verified lauegram results. Alexandre Dauvillier's initial tests of his X-ray diffraction method made use of sixteen "particularly difficult" pearls—eight "*perles japonaises*" and eight "*perles naturelles*." Lucien Pohl supplied all of them. Dauvillier reported that he was "able to formulate an exact diagnosis" for fifteen of the sixteen test pearls. He blamed a faulty image for his inability to identify the sixteenth pearl. The photographic plate produced during the failed sixteenth test had been "poor and dubious," he wrote. For some reason Dauvillier had not re-tested the pearl, but he argued that it "would certainly be distinguishable by a second exposure at a different angle of incidence."⁴¹³

Early access to testing machines gave Pohl and Dollfus ammunition in their criticisms of testing's effectiveness. As Dollfus stated in a deposition prepared for one of the cultured pearl trials, with pearl tests "the entire difficulty resides in the interpretation of what one sees."⁴¹⁴ Dollfus cast doubt upon the effectiveness of the lucidoscope and the

⁴¹² Lucien Pohl to Jacques Boyer, 14 January 1926, Robert Dollfus Papers, Bibliothèque de Malacologie, MNHN.

⁴¹³ A. Dauvillier, "Différenciation des perles naturelles et cultivées," p. 45.

⁴¹⁴ Copy of "déposition de Monsieur Dollfus Robert Ph. 38 ans, préparateur aux Hautes Etudes, devant Monsieur Krug-Basse, Juge d'Instruction en date du 4 Avril 1925," Robert Dollfus Papers, Bibliothèque de Malacologie, MNHN.

X-ray diffraction methods of pearl testing by questioning the assumed invariability of a *natural* pearl's internal structure. Of the many schematic diagrams of cross-sectioned natural and cultured pearls that appeared to that time, virtually all represented a natural pearl as a central point from which layer after layer extended concentrically outward.

Like Boutan, Dollfus stressed that *natural* pearls, objects that test designers thought of as structurally identical objects, were far more varied than schematic diagrams implied. He agreed with other pearl studies in that almost all “natural” pearls had formed as a result of the introduction of some kind of foreign matter, generally an incoming worm or other would-be parasite. However, even as pearly nacre secreted from the shell-forming tissues that folded over and enveloped many intruding objects, other objects—“secondary nuclei”—could become part of the growing pearl as well. Dollfus suggested that, in their haste to pronounce two distinct categories of pearl, wholesalers had overlooked the possibility of a larger secondary nucleus that could make an ostensibly “natural” pearl into a “cultured” one, if its core architecture led to a false positive result. The only clear distinction between cultured and natural pearls that the lucidoscope revealed to Dollfus was the far more pleasing uniformity of a cultured pearl's concentric layers.⁴¹⁵

By 1926, the lucidoscope and Dauvillier's X-ray diffraction methods themselves had undergone testing at the Office National des Inventions. Pohl and Dollfus had singled out the lucidoscope in particular for criticism. The endoscope, however, never received such a

⁴¹⁵ Copy of “déposition de Monsieur Dollfus Robert Ph. 38 ans, préparateur aux Hautes Etudes, devant Monsieur Krug-Basse, Juge d'Instruction en date du 4 Avril 1925,” Robert Dollfus Papers, Bibliothèque de Malacologie, MNHN.

checkup. Pohl complained to Dollfus in October 1926 that Perrin and Chilowsky had twice refused to let Pohl supply them with pearls and witness the testing of their method.⁴¹⁶ The bulletin of the Office National des Inventions instead carried an illustrated introduction to the machine, penned by the developer Francis Perrin himself.⁴¹⁷

In the trade journal *La Perle*, Perrin argued that testing methods that had been employed up to that time were either too laborious or else “only rarely give the certitude that a pearl is *fine*.”⁴¹⁸ As Perrin noted early on, he and Constantin Chilowsky had designed the endoscope in the first place to make use of more than one testing principle:

The discussions which have just taken place seem, to us, to show that our process and our apparatus, while furnishing a new infallible method of distinction by the lightning streak criterion, at the same time combines, in a most satisfactory manner, the advantages presented by all other optical methods suggested up to the present; the Szilard method, in a much more efficacious form, and the method of observation of the separation layers, invented by Mr. Ryziger,--all in one apparatus and almost in one operation, requiring a minimum of time and effort.⁴¹⁹

The lack of any opportunity to test Perrin’s claims of infallibility, however, added to Pohl’s concerns over competing pearl dealers’ growing access to France’s scientific community. He saw nefarious connections between the invention office (with which Francis’s father and soon-to-be Nobel Prize-winner Jean Perrin was affiliated), the French

⁴¹⁶ Lucien Pohl to Robert Dollfus, 28 August 1925, Robert Dollfus Papers, Bibliothèque de Malacologie, MNHN.

⁴¹⁷ “Endoscope pour l’examen des perles (note des inventeurs),” *Bulletin officiel de la direction des recherches scientifiques et industrielles et des inventions* (1 May 1926).

⁴¹⁸ “Messrs. Chilowsky & Perrin’s Endoscope,” *La Perle* 3, no. 1 (January 1926), p. 9.

⁴¹⁹ “Messrs. Chilowsky & Perrin’s Endoscope,” *La Perle* 3, no. 1 (January 1926), p. 9.

physical science community's public support of the difference between cultured and natural pearls, and Rosenthal's decision to spend one million francs to start the "Fondation Rosenthal," a scientific research foundation with Jean Perrin on the board of directors. "You will read there [in the most recent issue of the trade journal *Le Grand Négoce*] the details of a donation just made by Mr. Rosenthal, Patron of French Science," scoffed Pohl in a letter to Dollfus. "His munificence puts him in the good graces of a number of eminent scientists, whom he will attempt to influence in favor of his *antiscientific* activities. Fortunately, rare is the scientist who easily lets himself be influenced or even bought, contrary to what the perpetrator of the donation no doubt thinks."⁴²⁰

Still, Pohl and his camp's repeated criticisms of testing methods suggested that, even for the experts, testing a pearl was a probabilistic rather than a decisive practice. Dealers admitted that no test could provide conclusive proof of every pearl's identity. Ryziger and Galibourg wrote in 1927 that "two or three" different tests would allow for an identification to be made.⁴²¹ More tests, not a single crucial test, had led to stronger interpretive claims that a given pearl was cultured.

In the endoscope, pearl dealers found a multi-function machine that might inspire buyers and sellers with certitude. The cultured pearl and methods for its detection

⁴²⁰ Lucien Pohl to Robert Dollfus, 28 August 1925, MNHN. Emphasis mine, ellipses in original: "ses agissements...antiscientifiques."

⁴²¹ J. Galibourg and F. Ryziger, "Les Méthodes d'Examen et d'Étude des Perles Fines et des Perles de Culture," p. 133.

topped the agenda at the 1926 Amsterdam meeting of the International Congress of Manufacturers, Wholesale Merchants and Retailers in Jewelry, Gold, and Silverware. The Congress represented the first international conference of its kind. No representatives of pearl cultivation were present; the Congress's organizers had specifically refused to let any of Mikimoto's agents attend.⁴²² The sixty-four delegates who did attend the Congress witnessed the first public unveiling of two-in-one endoscope testing outside Paris and London. As London delegates reported back to the Diamond, Pearl and Precious Stone Trade Section, the Congress's attendees had "decided that there are various methods of definitely distinguishing between cultured pearls and pearls."⁴²³

The Spread of the Endoscope

The search for an infallible pearl test was also a search for an infallible supply chain, in which correctly drilled pearls gathered by hand from pearl oysters would pass through inspections and onto necklaces, bracelets, and brooches.

Pearl testing found homes where dealers hoped to ferry "natural" pearls from the Persian Gulf, to Bombay for drilling and stringing, through the wholesalers of Paris and London, and on to retail outlets around the world. Pearl testers exchanged information at international conferences about new instrumental techniques for the identification of pearls and precious stones. If in doubt, or in danger of a conflict with another pearl

⁴²² Meeting of the Standing Committee, 9 June 1926. Diamond, Pearl, and Precious Stone Trade Section Minute Book 1921-1927, CLC/B/150/MSi6600/001, LMA.

⁴²³ Meeting of the Standing Committee, 9 June 1926. Diamond, Pearl, and Precious Stone Trade Section Minute Book 1921-1927.

dealer, a pearl could always be sent to a laboratory for verification. Endoscope testing expanded across the networks that linked Paris, London, and other retail and transshipment centers to the coastal markets where pearls arrived from the sea. Within a short time the Perrin-Chilowsky pearl endoscope became the most widespread gem testing instrument in the interwar world.⁴²⁴ Not long after laboratories began to make heavy use of examinations with the Perrin-Chilowsky endoscope, the Diamond and Pearl Section and Chambre Syndicale proposed that pearl drilling practices be standardized in India. Merchants in the Gulf and India often avoided offering their best pearls individually. They required buyers to bid for packets of pearls of varying sizes and surface qualities.⁴²⁵ Most commonly, traders in India sold drilled pearls strung into “Bombay bunches.” The Diamond and Pearl Section requested a minimum drill diameter of three-tenths of a millimeter so that the endoscope needles could more easily slide through bunches of pearls as soon as they arrived.⁴²⁶

Endoscopes went to the center of pearl gathering in the Persian Gulf. In 1928, the

⁴²⁴ The endoscope also spread as members of the Paris pearl trade looked for ways to make back some of the funds they had put into its creation. In 1927, the Chambre Syndicale’s head of gem testing wrote the Diamond and Pearl Section informing them that unless they purchased twenty-five new endoscopes at fifty pounds per piece, the London gem dealers would have to return the instrument they had been using up to that time. Meeting, 9 February 1927, Diamond, Pearl, and Precious Stone Trade Section Minute Book 1927-1933, CLC/B/150/MS16600/002, LMA.

⁴²⁵ As a result, it often took several years to create a rope of pearls with several dozen—at times up to several hundred—color-matched, relatively unblemished pearls of evenly-graduated sizes. Jewellers almost undoubtedly incorporated pearls from a wide range of coastal areas into their longest and highest-priced necklaces.

⁴²⁶ 11 May 1927, Diamond, Pearl, and Precious Stone Trade Section Minute Book 1927-1933, CLC/B/150/MS16600/002, LMA.

British Political advisor to Bahrain reported that the Paris pearl dealer Jacques Bienenfeld had introduced “the apparatus for testing pearls” soon after reports indicated that cultured pearls might be arriving at the ports of the world’s largest pearl fishery in the Persian Gulf: “In cases of bored pearls it is considered infallible, but the case of unbored pearls it leaves a slight margin of doubt,” reported the advisor.⁴²⁷ In London, an “M. E. Alireza” bought two of the new endoscopes, along with “28 additional Needles and a dozen Bulbs, all of which would be shipped to Bombay.”⁴²⁸

Through local government initiatives and with direct pressure from French and British pearl dealers, the coastal areas that supplied natural pearls took steps to prohibit cultured pearls altogether. Between 1922 and 1930, three key sources of natural pearls—Western Australia, Venezuela, and Bahrain—instituted bans on the importation and possession of cultured pearls.⁴²⁹ Along with anti-cultured pearl legislation and labeling requirements came regulations that worked to shape pearls in ways that made them amenable to further inspection. Not long after laboratories began to make heavy use of examinations with the first widely accepted pearl testing instrument, the Perrin-

⁴²⁷ C. C. J. Barrett, “Report on the Trade of the Bahrain Islands together with statements of Imports, Exports, and Shipping Returns for the Year 1928,” in *The Persian Gulf Trade Reports v. 3 Bahrain I, 1905-1925* (Archive Editions, 1987). Barrett presumably did not realize that the endoscope was not a test for undrilled pearls.

⁴²⁸ 25 September 1928, Diamond, Pearl, and Precious Stone Trade Section Minute Book 1927-1933, CLC/B/150/MS16600/002, LMA.

⁴²⁹ Ronald Moore, “The Management of the Western Australian Pearling Industry, 1860 to the 1930s,” *The Great Circle* 16 no. 2 (1994), p. 134. Jacques Bienenfeld, editor of the Paris trade journal *La Perle* (and a dealer heavily invested in the Venezuelan pearl trade) introduced the April 1925 Venezuelan regulations as follows: “Nous sommes heureux d’informer nos lecteurs que, sur l’intervention de *La Perle*, avec l’appui des maisons Rosenthal, Bienenfeld, Modiano, Santana, Haiek, Miguel Abouhamad, nous avons obtenu du gouvernement du Venezuela l’arrêté suivant...” *La Perle* v. 2 no. 9 (10 June 1925), p. 2.

Chilowsky endoscope, the Paris and London wholesalers' associations proposed that pearl drilling practices be standardized in Bombay. They requested a minimum drill diameter of three-tenths of a millimeter so that the endoscope's needle could more easily slide through a drilled pearl to determine whether or not it contained a surgically implanted nucleating object.⁴³⁰ Instruments and testing certificates moved along the same circuits through which pearls changed hands. By the early 1930s, pearl testing laboratories and people engaged in research into the properties of pearls and precious stones could be found not just in Paris and in London, but in places like Vienna, Berlin, Amsterdam, Bombay, and New York City's Fifth Avenue.

In the wake of unsuccessful efforts to produce a convincing pearl test just after the arrival of Japanese spherical pearls, a substantial cross-section of Paris's international physical science community took up the challenge of identifying cultured pearls. Pearl dealers did not have persuasive methods of distinction before 1924, but the rapid unveiling of instrumental techniques thereafter offered quick and potentially corroborative ways of assessing a pearl's anatomy. In spite of objections brought forth by Pohl and his zoologist allies, other pearl dealers across Europe supported pearl testing's larger distinguishing enterprise and agreed, at least among themselves, that methods existed which could enact those distinctions.

⁴³⁰ London pearl dealers brought this up: "During the discussion it was suggested that in order to enforce a larger drilling, Indian Exporters should be advised that in future pearls drilled with a diameter of less than 3/10 mm would constitute a bad delivery, and the sale could either be cancelled by the buyer, or alternatively, he would be entitled to deduct 2.5% from the weight." 12 October 1927, Diamond, Pearl, and Precious Stone Trade Section Minute Book 1921-1927, CLC/B/150/MS16600/001, LMA.

Real Pearls Cultured

In 1927, a French appeals court revisited both Pohl's defamation suit against the *Chambre Syndicale* and Moussaïeff's suit against Pohl and Silbermann. The court's three rulings reiterated, as in the earlier 1925 ruling in Moussaïeff's case, that distinct natural and cultured categories of pearl existed. This time, however, judges suggested that testing had made such a distinction enforceable, as "laboratories were "already separating natural pearls from cultured pearls with certainty." The court affirmed that a pearl's provenance would need to be listed on all invoices.⁴³¹

For dealers in "natural" pearls, the 1927 rulings were a triumph. The following year, wholesalers and retailers gathered at their second international congress in Paris. An English translation of the conference proceedings signaled a change in dealers' attitudes:

In accordance with the surest principles of law and the most elementary equity, French jurisprudence has recognized that since cultivated pearls do not have the same value as veritable pearls, they ought to be declared as such at the moment of sale. That capital decision, reproduced by the International Bureau and sent out to all its members, has created a deep impression all over the world. It has put an end to the threat hanging over the pearl trade at one time.⁴³²

In contrast, a palpable sense of dismay rippled among supporters of pearl cultivation and its products. No one felt the sting more than the man who had been in the middle of court and machine trials, Lucien Pohl. "You have always treated me as a pessimist, but I have seen things rather clearly," wrote Pohl to the zoologist Robert

⁴³¹ "Les différents jugements sur l'affaire des perles de culture," *Le Grand Négoce* v. 7 n. 118-119 (5-20 August 1927).

⁴³² "Text of the Reports and Resolutions Passed by the Preparatory Conference," *La Perle* v. 5 n. 3 (30 Jan. 1928).

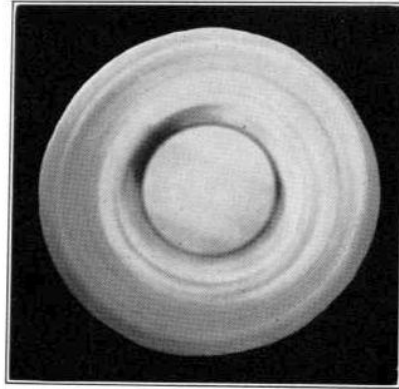
Dollfus on the day of the ruling. “The day one feels that there is no more justice, one can no longer be an optimist.”⁴³³

Meanwhile, visitors to Mikimoto’s newly opened New York office might have received a pamphlet with the prominent subtitle of *Real Pearls Cultured*. The title reflected Mikimoto’s revised commercial position after six years of French litigation—litigation that, it should be pointed out, would continue well into the 1930s. The pamphlet’s text gestured toward Lucien Pohl’s victory in court in May 1924: Mikimoto’s pearls were “real” in the sense that they were not “fake or imitations.” In the wake of subsequent French rulings in favor of distinctions between natural and cultured pearls, however, the wording in Mikimoto’s advertising materials also admitted that evidence of cultivation could be found inside a pearl: “In short, the only difference between Mikimoto and Oriental or wild pearls lies in the fact that the tiny nucleus around which the pearl is formed was, in one instance, placed in the oyster by Nature and, in the other by Man.”

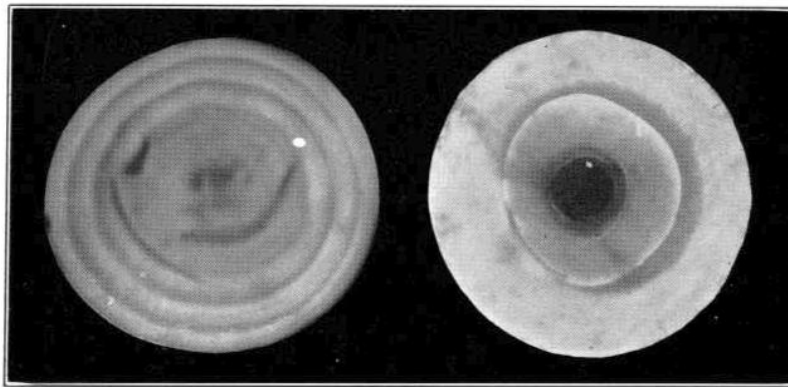
Amid court- and machine-mediated distinctions between the center of a cultured and a natural pearl, Mikimoto showed buyers cross-sections of his pearls’ interiors from the start (Figure 10). In so doing Mikimoto attempted to avoid problems of testing by signaling “tiny” internal differences in his pearls from all other pearls, cultured and natural alike. A “Mikimoto” Pearl (not, he stressed, a “Japanese” pearl) might not be “natural” in a legal sense, but Mikimoto wanted consumers to know that its external and internal structures were comparable to those of a natural pearl.⁴³⁴

⁴³³ Lucien Pohl to Robert Dollfus, 28 July 1927, Robert Dollfus Papers, Bibliothèque de Malacologie, MNHN.

⁴³⁴ K. Mikimoto, *Mikimoto Pearls: Real Pearls Cultured* (New York, undated).



Cross-section of "Mikimoto Pearl"



Two specimens of cross-section of Oriental or natural pearl

The above enlarged pictures clearly show that there is no difference between the Oriental or wild pearl and the "Mikimoto Pearl," except for the substance of the tiny nucleus. Note the heavy layers of nacre covering the nucleus

Figure 10. Mikimoto's preemptive cross-section of the "Mikimoto Pearl" (top) and two "Oriental or natural" pearls (bottom).⁴³⁵

⁴³⁵ K. Mikimoto, *Mikimoto Pearls: Real Pearls Cultured* (New York, undated).

Conclusion

Among pearl dealers in Paris who sought to avoid *perles japonaises*, separating incoming cultivated pearls from existing pearl stocks was central to the institutionalization of pressing desires: to fix a pearl's commercial identity, to protect their goods from a foreign threat, to watch over those who traded in pearls from Japan, and to restore faith that the dealer's label of *perle fine* would not be undermined.

Machines came to mediate Europe's pearl trade in two ways. In one sense, machines mediated between eye and object. Instruments provided new images and new forms of evidence to be interpreted by specialized testers. In a second sense, tests in turn mediated and settled differences of opinion among buyers and sellers. But pearl tests did not merely substitute gem dealers' visual inspections for the yes-or-no results of a machine. Even after the center of a pearl became the basis of its commercial identity, the pearl dealer's judgment of exteriors with the naked eye or under magnification did not disappear. Rather, the gem *dealer's* eye was supported by the gem *tester's* eye, the latter of which shored up trust in a pearl's interior with the light of an instrument.

Early twentieth century disputes over the distinguishability of natural pearls from cultured ones repositioned the starting point of appraisal in Europe's pearl trade from outside to inside. But the idea of testing a pearl for evidence of its inner structure was just one part of a broader argument in favor of the mutually exclusive "natural" and "cultured" categories that the practice of testing was designed to defend. Even when a buyer and seller trusted one another's motives, their inability to pick out a cultured pearl by sight

made the act of exchange itself suspect. Markets for “fine” pearls and other “precious” stones could not exist unless all parties could assure themselves that they bought and sold what they thought they were trading. In a post-1921 world, buying and selling “natural” pearls meant determining, first of all, that they were not “cultured” pearls.

Chapter Four

Everything Is Control: Cultivation and Competition in Two Bays

Ever since 1908, when its waters became embroiled in dispute over his first cultivation patent, Mikimoto Kōkichi directed his employees to orient Gokasho Bay toward the production of spherical pearls. By the 1920s, Mikimoto's footprint along the coasts of Gokasho Bay took the shape of demand for pearl necklaces. The Gokasho farm's rise as Mikimoto's primary facility for the surgical nucleation of pearl oysters was accompanied by changes in the neighboring bay of Ago, where Mikimoto had experimented with raising *akoyagai* shellfish and inducing them to produce semi-spherical cultured pearls since the 1890s. Because only negligible numbers of *akoyagai* had been found in Gokasho Bay prior to the early twentieth century, the cascade of spherical pearls from Mikimoto's Gokasho farm depended on shipments of two- and three-year-old "mother oysters"—initially by the hundreds of thousands, but before long by the millions—from his Ago farm and other villages in Ago Bay. "As with the farmer's spring and autumn, the pearler's fifth, sixth, and seventh months leave no time for idle reflection," wrote Mikimoto from Gokasho Bay in May 1913, the start of the year's shellfish arrivals and surgeries.⁴³⁶

⁴³⁶ Ototake Iwazō, *Denki Mikimoto Kōkichi* (Tokyo: Kōdansha, 1950), p. 193.

Mikimoto portrayed his network of a dozen farms, stretching from Ishikawa prefecture's Nanao Bay in the north to the waters off Palau at the southern Pacific edge of the Japanese empire, as spaces free from labor conflict. In Mie prefecture, where the Ago-to-Gokasho shellfish raising and nucleation circuit drove the company's sales of round pearls, media coverage highlighted an image of Mikimoto's smooth relations with the largely female workforce he employed and the Ago Bay villages with whom he negotiated in order to buy living shellfish and make use of waters that surrounded his headquarters on Tatoku Island. "The area of ocean space attached to the Mikimoto Pearl Culture Farm in Ago Bay now reaches 1.8 million *tsubo* (1470 acres)," wrote a reporter from the magazine *Taiyō* who had come to interview Mikimoto in 1924. "Here pearl [oyster] gathering is controlled as if the bay were Mikimoto's garden pond. The situation is such that no one is allowed to disrupt this."⁴³⁷

Before long, however, access to Ago Bay's coastlines and its living pearl oysters joined patents and pearls as flashpoints of struggle. Transformations along the expanding pearl farming shores of the Japanese empire took place amid the legal separation of natural pearls from cultured ones in Paris, but extended into a 1930s world in which new doubts about the value of all sorts of pearls came to the fore. This chapter follows a series of challenges to the exclusive claims that underlay Mikimoto's marine pearl cultivation activities, from the rise of village challenges to Mikimoto's Ago Bay hegemony in the mid-1920s to the expiration of the first generation of spherical pearl cultivation patents in the mid-1930s. It does so by looking at a decade of interlinked transformations in Ago and

⁴³⁷ "Yōshoku shinju to Mikimoto-ō," *Taiyō* v. 30 n. 12 (1 October 1924), p. 51.

Gokasho bays. Amid the substantial growth of cultivation across western Japan, Mikimoto's role as the holder of exclusive rights to cultivate shellfish in Mie prefecture—and his role as Japan's representative of pearl cultivation outside the empire—came under renewed scrutiny. In contrast, Mikimoto looked for ways to either limit the spread of saltwater cultivation or else track the overseas movement of cultured pearls from farms outside his own network. In the process, he adopted a new use for industrial property: not as a stick to attack patent infringers, but as a carrot to regulate cultivation activities by including his competitors in patent-sharing agreements.

Mikimoto, other would-be cultivators, and their subsequent chroniclers consistently framed these struggles as a test of wills, a clash of historical interpretations, and a collision of rights. Dispute looked as if it took place within the realm of the stable human claims of suzerainty over coastal waters and non-human creatures that were defined by Japanese patent and fisheries law. The key question, in other words, seemed to be over the identity of the person or group that could stake those claims. As we have already seen, legal rights were indeed a focal point of disagreement. However, battles among cultivators unfolded amid old and new understandings of the potential for bay waters to derail cultivation altogether. Private technologies and public works emerged in order to keep living pearl oysters safe in saltwater and safe from saltwater. These responses, in turn, became part of attempts to control men, women, and pearls on land. What resulted was a new set of divisions: between Mikimoto in Gokasho and his competitors in Ago, between large and small cultivators across the Japanese empire, and between cultured pearls that could leave Japan and others that could not.

Gathering and/or Cultivating Pearl Oysters in Tategami Village

In 1925, a challenge to Mikimoto's control over Ago appeared in the northern part of the bay. Its locus was in Tategami, a village located not far from his headquarters on the Island of Abundant Virtue, or Tatokujima. Its aftermath revealed new social and financial bases for the cultivation of pearls in Ago Bay and elsewhere in Japan.

The origins of the 1925 Mikimoto-Tategami battle lay two decades earlier, in the early years of Japan's first national fisheries law. As we saw in Chapter 1, the 1901 Fisheries Law (the *gyogyōhō*) standardized new categories of exclusive coastal fisheries rights, including demarcated cultivation rights (*kukaku gyogyōken*) and exclusive fishery rights (*sen'yō gyogyōken*) allocated to each village for the purpose of gathering certain varieties of marine creatures. The Fisheries Law formalized the boundaries of what had in many cases been longstanding (though, just as often, long-contested) coastal fisheries. Most dramatically, it redefined common fisheries as spaces under the management of a twinned pair of redefined units, the Meiji village and its attendant village fishing association. In principle, a single village held sole ownership over a fishery bounded by a defined area or areas of saltwater adjacent to the shoreline; in the case of waters which had previously been fished by people who were now registered in two or more different villages, only other villages with legal rights of access (*nyūgyōken*) could fish in those waters.⁴³⁸

⁴³⁸ Ninohei Tokuo, *Meiji gyogyō kaitakushi* (Tokyo: Heibonsha, 1981).

That a single village was responsible for a well-defined section of coastal waters did not, however, mean that its members were automatically entitled to gather or raise creatures in that space. Residents of a village were obliged to form a fishing association in order to exercise fishery rights. But fishing associations first had to apply for those rights, even to gather marine creatures in a village's waters. Associations did this by claiming to prefectural officials (in a prescribed written format accompanied by maps) that the gathering of a given set of creatures fell under the rubric of custom.⁴³⁹ Village fishing associations could then, if their members agreed, lease the customary gathering rights described by *sen'yō gyogyōken* to individuals (or individual corporations) outside the village. But the situation was different for other categories of fishery rights, covering activities like the use of certain kinds of nets or the cultivation of plants and animals in the water. With a village's blessing, people not listed in the village's family registry could bypass the fishing association and go directly to the prefectural government to apply for non-customary fishery rights zoned inside the village's waters.⁴⁴⁰

The latter is precisely what Mikimoto had done after the Fisheries Law took effect. Leaders in two Ago Bay villages, Ugata (1903) and Tategami (1905), agreed to allow Mikimoto Kōkichi to apply to the Mie prefectural government in Tsu for Japan's first exclusive pearl oyster cultivation in their village's waters. In other words, representatives of both villages signed a contract stating that they supported Mikimoto's attempts to

⁴³⁹ Takahashi Yoshitaka, "*Shigen hanshoku no jidai*" to *Nihon no gyogyō* (Tokyo: Yamakawa shuppansha, 2007); David Howell, *Capitalism from Within: Economy, Society, and the State in a Japanese Fishery* (Berkeley: University of California Press, 1995).

⁴⁴⁰ Ninohei Tokuo, *Meiji gyogyō kaitakushi*.

claim cultivation rights demarcated over a portion of the space established as the village's fishery under the provisions of the Fisheries Law. The precise contents of the villages' agreements with Mikimoto differed (as did the amount and structure of the payments they received from Mikimoto), but both specified that Mikimoto would hold demarcated cultivation rights in each village's waters for twenty years, the maximum period allowed by the Fisheries Law. Tategami's contract stated explicitly that Mikimoto and his descendants could extend the contract under the same terms when the initial twenty-year term expired.⁴⁴¹

Leaders in Ugata and Tategami signed their agreements with Mikimoto at a time when residents of both villages devoted far more of their energies to agriculture than to fishing. Tategami's main fishery was a small sideline in sardines for fertilizer on land. No *ama* divers based themselves in the villages; substantial diving and fishing communities clustered primarily along the parts of the bay that bordered the Pacific, not the inner reaches of the bay where Ugata and Tategami were located.⁴⁴²

Both villages relied on landed farming more than neighboring Ago Bay villages at the turn of the century, but the idea of participating in saltwater pearl cultivation grew in appeal over the intervening two decades. More pearl cultivators, all of whom sought to purchase living pearl oysters, pushed up prices for living *akoyagai* shellfish over sixty-fold,

⁴⁴¹ Ōbayashi Hideo, one of Mie prefecture's most prominent post-World War II historians and one of the first writers to publish revisionist accounts of Mikimoto's business, discussed the Ugata and Tategami disputes in "Shinju yōshokugyō sōsetsuki no shomondai: Mikimoto no dokusen to sore e no tatakai," *Chihōshi kenkyū* (1962), pp. 141-151.

⁴⁴² Ōbayashi, "Shinju yōshokugyō sōsetsuki no shomondai."

from as low as ten *sen* per *kan* (3.75 kilograms) to levels approaching six yen or more by the mid-1920s.⁴⁴³ Villagers across Ago Bay started to think about raising pearl oysters. Others made plans to lease waters zoned for cultivation, as neighboring villages in Ago and Gokasho Bays had already done with Mikimoto and other marine entrepreneurs. As a result, people in Ugata and Tategami began to rethink the bargains they had struck with Mikimoto at the turn of the century.

Moves to gain cultivation rights ownership at the level of the village fishing association arose in Ago Bay amid village movements elsewhere in 1920s Japan to renegotiate tenancy agreements on land. As Anne Waswo has argued, the rise of tenant-landlord disputes in the wake of nationwide 1918 rice riots spurred increasingly strident villager demands for more lenient terms and state support for those demands in the form of nationwide tenancy regulations, while also revealing the declining political position of landlords.⁴⁴⁴ Rice and grain cultivating villagers in metropolitan Japan also by and large supported restrictions on the importation of competing sources of rice in Korea and elsewhere in the empire. By contrast, pearl cultivation disputes saw villagers with dreams of marine landlordship (at least in the more circumscribed form of cultivation rights ownership) taking on Mikimoto, whom they had come to see as an unwanted lessee of the state waters that had been redrawn under the 1901 Fisheries Law. Disputes also saw renewed attempts to link village economic activities with export markets, as other places in Mie prefecture and elsewhere across Japan had done since the nineteenth century

⁴⁴³ *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi* (1935), p. 39-40.

⁴⁴⁴ Ann Waswo, *Japanese Landlords: The Decline of a Rural Elite* (Berkeley: University of California Press, 1977).

through silkworm raising. But unlike sericulture (though similar to the cultivation of the mulberry trees whose leaves fed silkworms), pearl cultivation could not take place inside the home. Access to ocean space was a prerequisite for participation in the bayscape of pearl cultivation.

Residents of Ugata, the first village to allow Mikimoto to apply for demarcated cultivation rights in 1903, attempted to force Mikimoto to drop his claims to those rights when they came up for renewal in 1923. Their efforts, however, were short-lived. A settlement gave Ugata's fishing association a larger payment from Mikimoto, but left cultivation rights under Mikimoto's direct control.⁴⁴⁵ The biggest fight proved to be between Mikimoto and residents in Tategami, where village leaders had agreed in 1905 to let Mikimoto apply for a twenty-year demarcated right to gather and raise pearl oysters in 550,000 tsubo (around 450 acres) of the village's waters. By June 1925, some villagers moved to contest the renewal of the agreement. Among the village's leaders was Ōnishi Kōkichi, a man who claimed to have been a strike leader in Utah mines before he returned to Tategami. Ōnishi Kōkichi, the village's mayor Ōnishi Morizō, and several others in Tategami saw the village's earlier agreement with Mikimoto as a fundamentally flawed one. Leaders of the movement invited supporters to give anti-Mikimoto speeches ("Mikimoto will destroy Tategami") and made placards ("We must overcome both our own private interests and Mikimoto").⁴⁴⁶ Village-level branches of nationally-organized associations, including the Veterans' Association and the Youth Association, mobilized in

⁴⁴⁵ Ōbayashi, "Shinju yōshokugyō sōsetsuki no shomondai."

⁴⁴⁶ *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*, p. 49, 53.

support of the campaign. Participants were made to say an oath vowing not to report back to Mikimoto.⁴⁴⁷

Chief among the Tategami villagers' grievances was the clause that allowed Mikimoto (and his descendants) to renew his agreement with the village, and renew his demarcated cultivation rights with the prefecture, every twenty years in perpetuity. But the Tategami campaign's strategy to invalidate the agreement came to hinge on interpretation of other clauses. The existing 1905 agreement stipulated that Tategami villagers would become Mikimoto's exclusive supplier of any pearl oysters they could gather in the same waters over which Mikimoto would apply for cultivation rights. But villagers said that, in practice, Mikimoto did not let them gather pearl oysters. In an interesting parallel to the rhetoric of visual appraisal surrounding cultured pearls in France and England at the time, Mikimoto claimed that there was no way for anyone to distinguish a cultivated pearl oyster from a non-cultivated oyster within the spaces covered by his exclusively demarcated fishery.⁴⁴⁸

Tategami's leaders argued, first to Mikimoto and later to prefectural and Ministry of Agriculture and Commerce fisheries officials in Tsu and Tokyo, that Mikimoto's position was faulty.⁴⁴⁹ Three arguments cut to the problem of sorting between cultivation and gathering. First, Tategami's leaders said that Mikimoto had himself been using Tategami's waters for the gathering of mother oysters with his hired *ama* divers.

⁴⁴⁷ *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi.*

⁴⁴⁸ *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi.*

⁴⁴⁹ *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi.*

However, the gathering up of shellfish as such was only covered under the exclusive pearl oyster gathering rights that the Tategami village fishing association had been granted by Mie prefecture in 1909, not by the demarcated cultivation rights that the villagers had acceded to Mikimoto.⁴⁵⁰

Second, Tategami's leaders contended that changes in methods of pearl oyster raising made it unnecessary for a single cultivator to hold demarcated rights to hundreds of acres of ocean space. Although other cultivators were also adopting similar methods, Mikimoto had a marked technological and spatial distinction of having a patented system for holding living pearl oysters inside cages suspended from floating rafts. The combination of raft and cage was a technology that, by putting shellfish into metal containers tied to ropes that could be raised or lowered from the surface of the water, had placed relatively seafloor-dwelling and immobile creatures into suspended and relatively mobile vessels. Cages had emerged as one solution to predation by octopi and other creatures. But attaching cages to floating rafts also changed the economy of diving labor: the ability to descend fifteen meters or hold one's breath underwater for any length of time was no longer necessary in order to take care of a shellfish once it had been put inside a cage. Some *ama* continued to work for Mikimoto as breath-divers. But by the late 1920s diving prowess was fast becoming something to be demonstrated to Mikimoto's visitors, not an integral part of day-to-day pearl farm work. A job with Mikimoto was

⁴⁵⁰ The village applied for gathering rights in 1903 but did not receive them until 1909. This was after Mikimoto's 1905 rights, but village leaders argued that the 1901 national Fisheries Law allowed them to continue using customary practices until they had received a ruling on the overlapping gathering and cultivation rights. *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*, p. 61.

increasingly likely to involve tasks along the shoreline, where cages could be prepared, pearl oysters could be placed in them, and both could be scrubbed and scraped of barnacles and sea plants during semi-annual cleanings.⁴⁵¹

Villagers argued that Mikimoto's extensive aquatic infrastructure signaled a departure from the initial agreement, which had merely approved Mikimoto's request to use the waters for putting surgically nucleated pearl oysters on the seafloor. Raft-and-cage enclaves had created not only new and sharply delimited spaces of cultivation but also a dramatic concentration of cultivation. Each cage was composed of seven levels. Each level held fifteen to twenty pearl oysters. A single wooden raft could support around sixty cages, thus roughly seven thousand pearl oysters, in suspension. Multiple rafts could, in turn, be lashed together.⁴⁵² Village petitions estimated that Mikimoto's rafts extended across only 100 of the 550,000 *tsubo*—less than a tenth of a percent—of the Tategami waters covered by his cultivation rights.⁴⁵³ As a result, the villagers attempted first of all to reclaim the remainder of the fishery as a site for the *gathering* of pearl oysters. They went into the waters of Ago Bay in efforts to destroy Mikimoto's wooden boundary stakes and put down new ones to mark the village's claims.⁴⁵⁴ By this logic, Mikimoto was not just infringing on the village fishing association's customary gathering

⁴⁵¹ *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*.

⁴⁵² Lucien Pohl, "Les progrès de la culture de la perle fine," VIIIe Congrès des Pêches et Industries Maritimes (Boulogne, 1923), held in Bibliothèque de Malacologie, MNHN.

⁴⁵³ *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*, p. 97.

⁴⁵⁴ *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*, p. 83.

rights. He was also cultivating pearls according to methods not foreseen under the 1905 contract.⁴⁵⁵

Third, Tategami's leaders noted that precisely because Mikimoto had essentially admitted that telling a cultivated shellfish apart from any another was not possible at first glance, all pearl oysters should be fair game for gathering rather than completely off limits.⁴⁵⁶ To Tategami's leaders, the raft-and-cage technology marked a clear boundary between the cultivated shellfish behind bars and ones outside them. The villagers put forth a variation of the argument made by Mikimoto's agents and their supporters in Europe when faced with efforts to distinguish natural from cultured pearls. Outside a cage, it was not immediately possible to sort living shellfish that had undergone a surgical nucleation procedure from those that had not. Because the villagers claimed gathering rights in the same space as Mikimoto's cultivation rights, villagers contended that all shellfish living outside cages were fair game for gathering.

In late December 1925, the six-month struggle between Mikimoto and Tategami ended with the mediation of Mie prefecture's governor. Mikimoto agreed to cede three-quarters of his demarcated rights to Tategami village.⁴⁵⁷ As a result, Mikimoto lost cultivation rights over a significant swathe of waters off the eastern edge of his

⁴⁵⁵ In November some Tategami villagers began to gather pearl oysters. Mikimoto reported them to the prefectural police. *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*, p. 103-104.

⁴⁵⁶ *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*, p. 58.

⁴⁵⁷ Ōbayashi Hideo, "Shinju yōshokugyō sōsetsuki no shomondai," p. 150.

headquarters on Tatoku Island (though officials estimated that the value of Mikimoto's remaining fourth was equal in value to amount he had lost).⁴⁵⁸

Nearly ten years later in 1935, Tategami's former mayor Ōnishi Morizō memorialized the village's battle with Mikimoto by editing the *History of the Capture of the Tategami Fishing Association's Demarcated Pearl Oyster Fishery Rights* (*Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*). Ōnishi billed it a success story of village rights protest, produced by and for the residents of Tategami.⁴⁵⁹ But the scramble to claim ocean space, or keep others away from it, was producing multiple interpretations of the pearl cultivation industry as a national industry, both in the form of Mikimoto's claims to benevolent hegemony in Ago Bay and the Tategami villagers' accounts of their own David versus Goliath tale.

The *Kakutokushi* included an anecdote, from the villagers' perspective, of an early attempt in late July 1925 to negotiate face-to-face with Mikimoto at his Tatoku headquarters. Mikimoto, here in the villagers' recollection of his response and in other interviews and correspondence, saw monopoly control over Ago's waters as the cornerstone of cultivation: "My business is a thoroughly national one. I do not make it my goal to serve the interests of one man or one house. From this point of view my business profits the nation. In order to firm up the basis upon which it rests, my ambition in the future is to make all the waters of the bay into my own exclusive fishery." Mikimoto was not alone in his view of local monopoly. Other cultivators, including Mikimoto's former

⁴⁵⁸ *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*, p. 142.

⁴⁵⁹ *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*.

patent foe Kitamura Kōichirō on the island of Tsushima, had established dominant positions in certain bays by applying for or leasing a preponderance of spatially demarcated pearl oyster cultivation rights.⁴⁶⁰

Tategami villagers recalled that Mikimoto had first appealed to their lack of experience. “As with Asakusa *nori* and Hiroshima oysters, I plan to cultivate pearls on a massive scale. I cannot say for sure that no one else could succeed at cultivation. But my business today is the result of years of hardship and struggle. This isn't something that can be done in a single day. Farmers and carpenters (*daiku*) have grown up for generations in Tategami village and other places like it. You have no experience with pearl cultivation at all. It is extremely risky for you to try your hand at it. You have no chance of making any money, so don't get any foolish ideas. Do what you have done best up to now, which is farming and carpentry.”⁴⁶¹

Mikimoto was said to have suggested that he had friends in high places. “When the Fisheries Law was being drafted, I asked Prime Minister Katsura to include pearl oyster demarcated fisheries as a fishery category of its own. In other words, these fishery rights were special rights (*tokken*) granted to my business. It is obvious that the nation's laws now protect my business. To ignore this fact, to come here telling me to hand over my fisheries rights, is the highest outrage.”⁴⁶²

⁴⁶⁰ Nagao Kayo, ed., *Tsushima shinju no umi ni ikiru Saitō Shigeo no shōgai* (Fukuoka: Sōshinsha, 2005), pp. 59, 65.

⁴⁶¹ *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*.

⁴⁶² *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*.

Finally, villagers remembered Mikimoto's move from friendly advice to a firmer warning: "My farms are not only in Tategami's waters. I have relationships with many other towns and villages. If I were to give in to Tategami's demands, its influence would soon spread to other places. Since it is clear that my business would be upturned, there is no way I can agree to whatever demands are made of me."⁴⁶³

The import of Mikimoto's words were clear to village leaders—and certainly to the chroniclers among them who subsequently relayed them in print. Hadn't people in Tategami always been farmers and carpenters, after all? Hadn't the movers and shakers of the Fisheries Law envisioned Mikimoto as the personal standard bearer of a new class of pearl oyster cultivation rights in Ago Bay and, for that matter, in Japan? Wouldn't Mikimoto's business—a business in the service of the nation—fall if Tategami were to set an example that other villages might follow?

The Mikimoto-Tategami dispute was not just about a single company squaring off against a single village. It pitted Mikimoto, the man known as Japan's first and largest pearl cultivator, against villages like Tategami, marine entrepreneurs across western Japan who sought their own access to saltwater and shellfish, and sympathetic government fisheries officials. Tategami leaders charged that Mikimoto's conduct did not exhibit the "decorum of a gentleman" (*shinshiteki taido*), one who was then serving a seven-year term in the Japanese Diet's House of Peers.⁴⁶⁴ His refusals to engage with the

⁴⁶³ *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*, p. 31-32.

⁴⁶⁴ *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*, p. 30, 109. Mikimoto was selected in 1924 as Mie's "high taxpayer representative" (*tagaku nōzeisha giin*) in an election in which the top fifteen taxpayers in each prefecture voted to send one among them to the upper house of the Diet.

villagers' demands for access to the village's bay waters spurred them to appeal to higher authorities (which they framed in an older language of powers "under heaven" (*tenka*))⁴⁶⁵ in Tsu and Tokyo and to seek out commercial allies in Kobe and Osaka. As with earlier patent battles, a choice of one man's monopoly versus a wider (but in many ways still limited) array of players began to present itself.

Over time, Tategami's leaders buttressed moral appeals for access to village waters with arguments framed in a legal language of fishing rights. Whenever villagers performed their in house protest song, the "Take Back Our Fishing Rights Anthem," (*Gyoken kakutoku sendenka*), they rued December 28, 1905 as "the day when the rights to our Tategami's ocean wealth were taken away." They announced, however, that "we have opened our eyes to legal rights" and that "the key to licenses lies with the governor."⁴⁶⁶ One man who had helped to open their eyes was a Kobe-based pearl wholesaler and pearl culture speculator named Ōkubo Tadanori. Based on the chronology of Ōnishi Morizō's 1935 narrative of the villagers' protest, which starts in June 1925 with village leaders travelling to Osaka to discuss their contract with Ōkubo, this relationship was crucial to the villagers' formulation of legal justifications for their economic concerns. When Tategami village leaders traveled to the prefectural capital at Tsu and to fisheries officials

⁴⁶⁵ *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*, p. 30.

⁴⁶⁶ The lyrics to the song's two stanzas (with several redacted areas) can be found in *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*, pp. 49-51.

in Tokyo during the latter half of 1925, they delivered petitions that included arguments drafted with Ōkubo's help.⁴⁶⁷

As the dispute between Mikimoto and Tategami stretched on, Ōkubo was among twenty-eight pearl cultivators and buyers who gathered in Kobe in November 1925 to form the *Nihon Shinju Yōshoku Kumiai*, Japan's first pearl cultivators' association.⁴⁶⁸ The twenty-eight included members like Mikimoto's onetime patent challenger Kitamura Kōichirō. Many claimed substantial demarcated cultivation rights in other parts of western Japan. Mikimoto, however, was not among them. Its members participated in and expanded the Osaka pearl auctions that had been held occasionally since 1919. Sales to Japanese brokers, known in the trade as *nakagainin*, fueled the movement of pearls from western Japanese shores to a number of foreign buyers in Yokohama and especially in Kobe. The association's auctions went so well, in fact, that Mikimoto decided to set up a new, invitation-only auction of his own. Buying from Mikimoto required a promise, on pain of expulsion, not to buy from the competing association.

In the meantime, the association attempted to create a Mikimoto-free market for pearl oysters as well as pearls. Anti-Mikimoto cultivators expanded their concerns to the management of ocean space and the acquisition of ocean creatures. Association members coalesced in support of Tategami's ongoing claims to wrest cultivation rights from

⁴⁶⁷ *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*, p. 10. This Ōkubo Tadanori is not to be confused with the late Tokugawa period *daimyō* of the same name.

⁴⁶⁸ Ozeki Nobuaki, "Senzen ni okeru shinju dantai no hensen," *Suisan jihō, shinju tokushū* (1958), 14.

Mikimoto, a challenge which also promised to make seafloor areas adjacent to one of the Japanese empire's richest sources of *akoyagai* pearl oysters available for investment.⁴⁶⁹

If ownership of rights to use Ago Bay's waters and opportunities to trade for its marine inhabitants sparked 1920s battles between Mikimoto and Ago Bay villages of Ugata and Tategami, techniques for keeping pearl oysters alive in the bay became part of struggles over cultivation well into the 1930s. In the early months of 1926, following in the wake of the Tategami dispute and the formation of the anti-Mikimoto association, the waters in some parts of Ago Bay suddenly became much colder than just about anyone could remember. When Mikimoto's employees brought up some of the shellfish, it quickly became apparent that a catastrophe had occurred. In all, about one million of Mikimoto's Ago Bay *akoyagai* had died. Even before the mass shellfish deaths in Ago, Mikimoto had already begun to have *akoyagai* shipped by motorboat from the company's Ōmura Bay farm in Nagasaki to the Katada farm in neighboring Wakayama prefecture, one of Mikimoto many continued efforts to redistribute living shellfish to different parts of his pearl culture operations.⁴⁷⁰ Amid the chill, Mikimoto announced to the local papers that he would be moving many of his older Ago Bay pearl oysters, and the infrastructure that supported them, to the company's Kata Bay farm. He decamped from the surface of Tatoku Island as well, closing the school, tennis courts, dormitories, and post office that had received attention in domestic and foreign media and Mikimoto's advertisements as a

⁴⁶⁹ Ozeki Nobuaki, "Senzen ni okeru shinju dantai no hensen."

⁴⁷⁰ "Katawan o honkyo ni shi shinju no daiyōshoku," unattributed newspaper clipping marked June 1926, Mikimoto Pearl Island Museum Archives (MPIMA).

terrestrial counterpart to his efforts at undersea development. Some of the buildings were shipped from Ago and reassembled in Gokasho, where *akoyagai* received implantations of spherical pearl nuclei and where they spent several following years caged and suspended. Mikimoto did not stop gathering and buying young pearl oysters from Ago Bay, but he made a public offer to turn the formerly—and once again—uninhabited island of Tatoku into a park.⁴⁷¹

Other cultivators across western Japan experienced the cold snap as a disaster exacerbated by a novel legal attack on their livelihoods. Many of them, like Mikimoto, relied on living shellfish imported from Ago Bay; some of them were also members of the newly formed anti-Mikimoto association. While millions of *akoyagai* froze to death in Ago Bay, however, the governor of Mie prefecture issued a temporary order that banned the movement of the bay's pearl oysters to other waters. What this meant in practice was any cultivators outside the bay who relied on Ago shellfish—and, more specifically, anyone who hoped to buy them from Tategami village—would have no legal way to ferry them (caged, usually in small skiffs but occasionally in larger vessels) to other bays in Mie, Ehime, or Nagasaki prefectures. As in the patent disputes that had raged between Mikimoto and other cultivators, word was that Mikimoto had used his connections in the Mie government to claw back a semblance of revenge just months after prefectural authorities had brokered a victory for Tategami village and its cultivator supporters in the fight over demarcated fishery rights. The association's cultivators pressured the Mie

⁴⁷¹ "Katawan o honkyo ni shi shinju no daiyōshoku."

government and the central Ministry of Agriculture and Forestry to rescind the order. More of them began to look seriously at installing rafts and cages of their own—and taking advantage of Ago Bay’s waters for cultivation.⁴⁷²

The “Report on the Study of the Mikimoto Culture Pearl”

Coastal space and access to shellfish were becoming areas of cultivation rights conflict. So too were patented techniques for inducing the formation of pearls in living shellfish. Mikimoto had once owned the world’s first and only patent for cultivating the semi-spherical pearls found in brooches, tie-pins, and rings. After 1916, as saw in Chapter 2, he was one of several Japanese owners of patents for cultivating spherical pearls that might be drilled and strung on silk threads to form one of the early twentieth century’s most sought-after objects of adornment, the pearl necklace. Newcomer cultivators turned to non-Mikimoto patent holders to license spherical pearl induction methods. Patented claims, especially three issued to Nishikawa Tōkichi (patents no. 29628, 29629, 29630, and 30771) between 1916 and 1917 and one issued to Mise Tatsuhei (patent no. 37746) in 1919, shielded the movement of practical techniques for manipulating living pearl oysters from charges of infringement. And newcomer cultivators were turning to non-Mikimoto patent holders to license spherical pearl induction methods. They generally did this by paying hefty fees to hire a pearl oyster surgeon like Fujita Masayo, who had been Nishikawa’s colleague at Tokyo Imperial University’s department of zoology. Fujita

⁴⁷² Kuru Tarō, *Shinju no hatsumeisha wa dare ka?: Nishikawa Tōkichi to Tōdai purojekuto* (Tokyo: Keisō shobō, 1987), p. 235.

Masayo and his brother Sukeyo had both worked at Tokyo Imperial University and at Yodo Suisan (reorganized in 1920 as Yodo Shinju), a pearl company in Ehime prefecture, to develop a practical method for inducing pearl formation that was protected under the terms of Nishikawa's patent.⁴⁷³ Fujita was one among a handful of technicians-for-hire who traveled around western Japan, surgically nucleating pearl oysters in return for licensing payments and teaching other cultivators to perform the nucleation process themselves.⁴⁷⁴ As a result, patent licensors, patent disseminators, and patent owners formed several different linked but geographically dispersed networks. All worked around Mikimoto, who did not license the method for which he had received a patent in 1916. Between 1921 and 1924, however, Mikimoto also brought Fujita Masayo to his pearl farms to nucleate oysters. If Mikimoto's goal was exclusive control over cultivation methods, Fujita and many other surgeons-for-hire hewed closer to a franchise model of widely diffused pearl cultivation. When Mikimoto offered to keep Fujita on staff permanently, Fujita declined.⁴⁷⁵

Just as the anti-Mikimoto association was coalescing, Mikimoto received support from Japan's invention booster community. In November 1925, Baron Sakatani Yoshiro, head of the Imperial Association for the Encouragement of Inventions (*Teikoku hatsumeï*

⁴⁷³ Kuru Tarō suggests that the pearls involved in the first May 4th, 1921 London sensation (treated in Chapter 3) may have come from Yodo suisan rather than Mikimoto. Kuru, *Shinju no hatsumeisha wa dare ka?*, p. 235.

⁴⁷⁴ See Kuru, *Shinju no hatsumeisha wa dare ka?*, pp. 216-218, 243-245; Tange Makoto, *Nihon shinju sangyōron* (Tokyo: Shinju shinbunsha, 1986).

⁴⁷⁵ Kuru, *Shinju no hatsumeisha wa dare ka?*, p. 245.

kyōkai), sent a committee of five scientists to survey Mikimoto's pearl farms in Mie prefecture. The committee included three current and former Tokyo Imperial University professors (Sasaki Chujirō, Gotō Seitarō, and Kishinoue Kamakichi); Miyashima Mikinosuke, director of Japan's first medical research facility, the Kitasato Institute; and Senoo Hidemi, professor at the state-supported Fisheries Institute (the *Suisan kōshūsho*). The zoologists Kishinoue and Sasaki had both known Mikimoto for decades; Sasaki, we may recall from Chapter 2, submitted a report on Mikimoto's behalf during the trials over patent no. 2670.

In April 1926, the committee published its findings in a *sui generis* pamphlet entitled the “Mikimoto yōshoku shinju chōsa hōkokusho.”⁴⁷⁶ The pamphlet was soon translated into English as the “Report on the Study of the Mikimoto Culture Pearl” and (presumably by Mikimoto's Paris agent Lucien Pohl) into French. Baron Sakatani located the origins of the report in “differences of opinion in Great Britain and France with respect to the nature of the culture pearl.” The committee strove to rectify this by concluding that “the culture pearl is essentially identical in nature with the natural pearl.” Along the way, the report positioned Mikimoto as the overseas standard bearer of patented-in-Japanese pearl cultivation methods by presenting the spherical cultured pearl from the start as “the Mikimoto culture pearl.”⁴⁷⁷

⁴⁷⁶ “Mikimoto yōshoku shinju chōsa hōkokusho,” pamphlet (Tokyo: Teikoku hatsume kyōkai, 1926).

⁴⁷⁷ “Report on the Study of the Mikimoto Culture Pearl,” pamphlet (Tokyo: Imperial Association for the Encouragement of Inventions [Teikoku hatsume kyōkai], 1926).

The “Report on the Study of the Mikimoto Culture Pearl” described a company built on and sustained by patents, seventeen of them active.⁴⁷⁸ One 1924 patent (no. 60312) covered a system for the collection of free-swimming pearl oyster larvae, also known as spats. It consisted of a rectangular wire cage set inside a free-standing frame that could be sunk to the seafloor. The cage housed a washboard-like arrangement of steepled flat mortar boards into which holes had been drilled. Working from the observation that spats swim away from light (and, in general, toward the seafloor), dark material covered the sides and floor of the cage to attract larvae toward the boards—sometimes more than ten thousand in a single cage. As the report noted, “the silkworm cultivation which has developed to its present state from its origin in the wild silkworm, is an interesting parallel.” Mikimoto, indeed, no longer depended primarily on gathered oysters in the 1920s. Whereas other cultivators “flock[ed] to Ago Bay” to bid at auction for *akoyagai* shellfish, Mikimoto’s patent allowed him to amass “almost countless young pearl-oysters in his possession for his own use.”⁴⁷⁹

Above all, the “Report on the Study of the Mikimoto Culture Pearl” (in Japanese and in its translated forms) stressed Mikimoto’s priority in developing methods of spherical pearl cultivation. It highlighted Japanese patent no. 29409, issued to Mikimoto just before the first Nishikawa patents in 1916, and a subsequent improved method for which a patent had been granted in 1919 (patent no. 33640). At the same time, the report

⁴⁷⁸ The report described nine patents on “culture pearls,” four on “culture cages,” two on “Attachment of Larvae,” and two on “regulation of lustre of pearls.” “Report on the Study of the Mikimoto Culture Pearl,” p. 2.

⁴⁷⁹ “Report on the Study of the Mikimoto Culture Pearl,” p. 4-5.

made no mention of competing methods, which, in Nishikawa's case, had been patented overseas in Australia and the United States (but not in Japan) before Mikimoto's patent no. 29409. Mikimoto's two patents together described a method for removing a square piece of shell secreting epidermal tissue of a still-living (but soon to be dead) donor pearl oyster, wrapping the tissue around "a tiny fragment of fresh water mussel," sewing the "fleshy bag" shut with a cord, and inserting it beneath the epidermal tissue of a second living pearl oyster. Seconding the earlier opinions of H. Lyster Jameson and Louis Boutan at the start of the London and Paris pearl sensations, the committee concluded that the resulting pearls were "in lustre, colour, in shape, and in every other way, equal to natural pearls."⁴⁸⁰ "For this invention, now universally known, Mr. Mikimoto deserves the highest praise," read the report's English language translation.⁴⁸¹ But the Imperial Society for the Encouragement of Invention made a second move by asserting national priority in spherical pearl cultivation through Mikimoto's priority: "Thus we claim for Japan the honor of succeeding in producing by means of modern science the round culture pearl, before any other country even dreamed of such a possibility."⁴⁸²

With the Invention Society's endorsement, Mikimoto and his employees soon ferried copies of the "Mikimoto Culture Pearl" report to England, France, and the United States. During a subsequent 1926 journey in San Francisco, Mikimoto went with one of his traveling companions, the doctor Miyashima Mikinosuke (who was among the invention

⁴⁸⁰ "Report on the Study of the Mikimoto Culture Pearl," p. 2-3.

⁴⁸¹ "Report on the Study of the Mikimoto Culture Pearl," p. 3.

⁴⁸² "Report on the Study of the Mikimoto Culture Pearl," p. 2.

association committee's five members) to Palo Alto meet with Stanford University president and noted ichthyologist David Starr Jordan.⁴⁸³ Mikimoto brought Jordan, who had visited Mikimoto's Ago Bay Farm several years before in 1922, a copy of the invention report's English-language translation. Several long passages of the report appeared verbatim in *Scientific American* (cited as "the Sasaki circular") as part of Jordan's 1927 article "Mikimoto and the Cultured Pearl."⁴⁸⁴ Other periodicals carried snippets of the report as well.⁴⁸⁵ Mikimoto's English and French language advertising materials, in turn, cited Jordan as a supporter of the equivalence of natural and cultured pearls and as someone who acknowledged Mikimoto's leadership role in pearl cultivation.

Patents and the Reorganization of Cultivation

Questions about patent ownership were enmeshed in Mikimoto's complicated family ties. In 1926, Nishikawa Tōkichi's son Nishikawa Shinkichi turned twenty years of age. At that time Shinkichi gained ownership of the patents that formed the basis of techniques licensed by the vast majority of Mikimoto's competitors (and, from the early 1920s, by

⁴⁸³ Kuru Tarō mentions this episode in *Shinju no hatsumeisha wa dare ka?* Mikimoto himself spoke of his plans to travel to Palo Alto in the Japanese-language San Francisco newspaper *Nichibei Times* (2 November 1926), a clipping of which is held in MPIMA.

⁴⁸⁴ David Starr Jordan, "Mikimoto and the Culture Pearl," *Scientific American* (October 1927), pp. 300-302. This article also included a condensed version of an article Jordan wrote after his 1922 visit to Japan. See David Starr Jordan, "The Culture-Pearl Fishery of Japan," *The Scientific Monthly* v. 17 n. 4 (October 1923), pp. 388-393.

⁴⁸⁵ Page three of the 16 October 1927 edition of *The Japan Times and Mail* carried dueling articles. On the left was a version of Jordan's *Scientific American* article, subtitled "Culture Pearls Show No Difference in Color, Form, or Substance from the Native [sic?] Pearl;" on the right, an article by a W. Grahmann, translated from German to English, with the subtitle "Science Discovers New Way in Which to Tell Difference Between Natural and Cultivated Pearls."

Mikimoto himself). Shinkichi, however, was also Mikimoto's grandson. Mikimoto had once in fact licensed the patent-pending Nishikawa method from his son-in-law Tōkichi in the early twentieth century, a time during which Tokichi had stayed several times on Tatoku Island. But Mikimoto and the elder Nishikawa had fallen out in the years before Tōkichi's 1909 death. Nearly two decades later Mikimoto appealed to Shinkichi, who been raised by Mikimoto's daughter and who had lived with his grandfather's financial support, to direct the patents on Shinkichi's behalf. One of Mikimoto's strategies was to invoke the Imperial Association for the Encouragement of Invention committee's report, which his patent lawyer Uchimura Tatsujirō—who was, to top things off, a relative of committee member and Mikimoto travelmate Miyashima Mikinosuke—brought up to Shinkichi as evidence of his grandfather's priority in pearl cultivation. At the end of 1927, Mikimoto received an unprecedented Imperial Invention Association-sponsored award from Emperor Hirohito.⁴⁸⁶ The following year Shinkichi agreed to allow Uchimura to manage the licensing of his patents. As a result, Mikimoto took direction of the same patents used by his competitors.⁴⁸⁷

Shinkichi's transfer of patent management responsibilities to Mikimoto's legal team did not happen without resistance. Nishikawa Tōkichi's brothers, one of whom had been engaged in cultivation in with farms including those owned by the Ōmura Bay Pearl

⁴⁸⁶ See, for example, the article "Mr. Mikimoto's Great Work Now Recognized," in *The Japan Times and Mail*, 4 December 1927.

⁴⁸⁷ Much of this paragraph relies on documents that were part of the deceased author Kuru Tarō's personal collection of Nishikawa Tōkichi's papers. See, generally, chapter 8 of *Shinju no hatsumeisha wa dare ka?*

Company, advised Shinkichi not to relinquish control over the patents.⁴⁸⁸ Kawamura Tamiji, a Kyoto Imperial University zoologist who had worked closely with Nishikawa Tōkichi and who had helped to edit a posthumous 1914 volume of his writings, publicly asserted Nishikawa's priority and questioned the Mikimoto narrative as part of a December 1927 article in the well-known journal *Kaizō*.⁴⁸⁹ Not long thereafter, Shinkichi sent letters to other cultivators informing them of his decision to give Mikimoto's lawyer control over the Nishikawa patents.⁴⁹⁰ Some members of the anti-Mikimoto association brought up what would have been an unthinkable idea just three years before: allying with the Pearl King.⁴⁹¹ In September 1928, many of the same cultivators who had once joined together against Mikimoto agreed to form the *Dai Nihon Shinju Kumiai*, a new association headed by Mikimoto's younger brother Saitō Shinkichi.⁴⁹²

The second-generation cultivators' association addressed some of Mikimoto's long-held desires to place limits on the number of cultivators and cultured pearls. The growing backlash against spherical cultured pearls in 1920s Europe had prompted Mikimoto to propose the implementation of an industry-wide system for grading pearls, not just for his own company but for his competition as well. In August 1925, just after the

⁴⁸⁸ Shinkichi's uncle Nishikawa Torakichi wrote Shinkichi in 1926 as was about to turn twenty and gain rights to the patent. Kuru Tarō, *Shinju no hatsumeisha wa dare ka?*, p. 284.

⁴⁸⁹ Kawamura Tamiji, "Nihon no shinju," *Kaizō* (December 1927), p. 49.

⁴⁹⁰ Kuru Tarō, "Shinju no hatsumeisha wa dare ka?," p. 287.

⁴⁹¹ It had, however, become thinkable not long after Nishikawa turned twenty years old in 1926. Several leaders of the association brought up the options of allying with Mikimoto at a general meeting held in November that year. Ozeki Nobuaki, "Senzen ni okeru shinju dantai no hensen."

⁴⁹² Ozeki Nobuaki, "Senzen ni okeru shinju dantai no hensen."

French Agriculture Ministry's nomination of three members of the Paris pearl wholesaler community as fraud repression agents to enforce labeling requirements for cultured pearls, Mikimoto's overseas managers informed commercial attachés connected to the Japanese Foreign Ministry of the company's desire for pre-export pearl inspections in Japan. Testing offices needed to be established "at each cultivation site," with tests carried out "according to the strictest standards" to an extent that "not even a single substandard pearl would leave any cultivation sites."⁴⁹³

The reconstituted association established new boundaries around spherical pearl cultivation practices. It consolidated the three foundational sets of 1916-1917 patents—granted to Nishikawa, Mise Tatsuhei, and Mikimoto—along with a method subsequently patented by the cultivator Ōtsuki Kikuo. Mikimoto's method was reserved for the Mikimoto Pearl Company alone. Mikimoto agreed not to contest the widespread use of cultivation methods based on the Nishikawa patented process, but only under certain conditions. One condition was that only association members would make use of the Nishikawa process. A second was that members were to pay licensing fees to the association for the use of the patents: one *sen* per pearl oyster. A system of quotas specified the total number of pearl oysters on which each cultivator could operate; Mikimoto himself agreed to pay a yearly three-thousand yen licensing fee for the nucleation of 300,000 oysters with the Nishikawa method.⁴⁹⁴

⁴⁹³ Accessed through the Japan Center for Asian Historical Records (JACAR). Reference Code B02030443400.

⁴⁹⁴ Ozeki Nobuaki, "Senzen ni okeru shinju dantai no hensen." A copy of the quota agreement is held in MPIMA.

Amid European comparisons of cultured pearls to thinly electroplated silverware, members of the new association were bound to keep all their oysters in the water for at least three years, to allow for a thicker covering to form over the spherical nuclei that were surgically implanted in each shellfish.⁴⁹⁵ Attempts to enforce a minimum time period before the opening of shellfish worked against small-time cultivators who wanted to harvest their pearls as soon as possible. Pearl cultivation attracted marine entrepreneurs in the 1920s, but a new farm faced significant risks.⁴⁹⁶ A one-man cultivation outfit might purchase and surgically nucleate twenty thousand *akoyagai* each year, a far cry from the millions of pearl oysters that Mikimoto's technicians operated upon annually at the Gokasho Bay farm. One hypothetical pearl cultivation budget hinted that most small-time newcomers took out yearly loans to buy materials and shellfish. No money would come in, moreover, until the first crop of pearl oysters could be gathered and opened after three, four, or even five years in the water. According to this calculation, a newly started cultivator might clear ten thousand yen in the third year of operation, two years after (hypothetically) going into debt for eight times or more that amount.⁴⁹⁷ The estimate did not account for the fluctuating prices offered by wholesale buyers in Kobe or for the varying quantities and sizes of the pearls a cultivator could obtain in a given year.

⁴⁹⁵ Ozeki Nobuaki, "Senzen ni okeru shinju dantai no hensen."

⁴⁹⁶ Tategami villager leaders themselves noted that there were "sixty to seventy" cultivators in more than one hundred locations throughout Japan as of 1925. *Tategami gyogyō kumiai shinjugai kukaku gyogyōken kakutokushi*, p. 39.

⁴⁹⁷ Fujita Masakatsu, *Shinju yōsei* (Tokyo: Rakusuikai, 1923).

From 1928 onward, the Mikimoto-led association implemented a system, in principle, for structuring pearl cultivation practices in the water, grading pearls into multiple categories before they left Japan, and selling them through prescribed auction channels. Two inspectors (graduates of the Tokyo *Suisan kōshūsho* fisheries institute) examined pearls according to their size, shape, and presence or lack of blemishes. Pearls that made the first grade received the association's in-house export seal. Pearls that did pass inspection went to a reconstituted Osaka auction that, for the first time, included some of the Mikimoto pearls not reserved for the company's in-house sales outlets.⁴⁹⁸ These practices were part of a longer history of Japanese export inspections, one that since the early Meiji years had included publicly supported centers for the empire's most valuable agricultural commodities of silkworms, silk, tea, and rice. The twist here was that patents drove the formation of the pearl inspection system. Inspections, in turn, provided a rationale for issuing seals of approval to a first cut of export-quality pearls while sentencing the remainder to quarantine away from brokers in Japan and retail buyers elsewhere in the world.

Restructured local markets, however, soon met the vicissitudes of markets elsewhere in the world. Wall Street's stock market crashed in October 1929, just as the new association's inspection system was getting underway. With the turmoil of depressed overseas demand came two changes—Mikimoto's increasingly intensive pearl cultivation

⁴⁹⁸ *Kikinzoku tokei shinbun*, 21 October 1928, MPIMA; Tange Makoto, "Shinju sangyō ni okeru hinshitsu kisei," *Kikan shinju bijinesu* no. 1 (April 1989).

and rising numbers of new small-time cultivators—that together struck a blow at the association and its mission of control.

1. “Mikimotoed”

In Gokasho Bay, Mikimoto appointed his son-in-law Mutō Inatarō, then on leave from his post as a vice-admiral in the Japanese navy, as the new director of the farm. At the beginning of 1931, Mutō shut down the Gokasho Bay farm for four months on the orders of Mikimoto, who cited reports of plummeting sales in the company’s New York store during the previous year’s Christmas season. “America’s huge downturn (*dai fukeiki*) has ravaged my own life’s work, the cultured pearl industry,” said Mikimoto on the eve of the new year. “As it stands, the ‘Mikimoto Pearl’ will not be able to keep going. I have no choice but to order the suspension of activities at all my pearl farms until the end of next April.” Forecasting according to a calendar of global exposition, Mikimoto announced that “I am prepared for the possibility that America’s depression might not be relieved until the 1933 Chicago World’s Fair.”⁴⁹⁹

Mutō reopened the Gokasho farm in the spring of 1931 with plans for efficiency through mechanization. Mother oysters underwent X-ray inspections in order to check that their implanted nuclei were being covered with pearl nacre secreted from the mantle tissues that had been transplanted alongside them. Workers at the farm began to produce the wire cages that housed shellfish *en masse*. A contraption moved cages into and out of

⁴⁹⁹ *Osaka Mainichi Shinbun*, 31 December 1930. Mikimoto claimed that total revenues would fall by 800,000, a “42 percent drop”—indicating expected 1930 annual sales of 1.9 million yen.

bubbling vats that left them coated in a protective layer of tar. Another machine separated pearls from the flesh and shell of dead mother oysters. For at least one winter, “heaters” (*danbō*) of some sort had been used in order to warm the bay waters near the farm’s oysters; this was abandoned once it was determined that some shellfish did not fare well under the heat either.⁵⁰⁰ Under the vice-admiral’s direction, the farm began to construct some of the boats that plied the waters of the bay in-house as well. As one visiting American correspondent put it in early 1932 (a year after the brief shutdown), if Dearborn, Michigan had been “Fordified,” Gokasho Bay had been “Mikimotoed.”⁵⁰¹

The Gokasho farm reached its largest extent in 1934, when a man named Ogihara Takayuki arrived from Tokyo’s elite Waseda University as one of Mutō’s new managers. Men and women hauled in bivalves for mechanical shucking and separation all year round, as Ogihara later recalled, “regardless of the season.” In all, over one thousand employees processed ten million oysters per year. Not all the shellfish survived their subsequent years caged in the water, but enough did to yield an annual haul of six million pearls. They were, by more contemporary standards, rather small: half reached five millimeters in diameter, the remainder between six and seven millimeters.⁵⁰²

Of the many changes that had transformed Gokasho in the early 1930s, one thing stood out to Ogihara. Where male technicians had once been solely responsible for

⁵⁰⁰ *Shin'en shinju nanajūnen*, (Tokyo: Shinju Shinbunsha, 1978), p. 154.

⁵⁰¹ Henry Albert Phillips, “A Pearl Farm in Japan,” *The Baltimore Sun*, 24 January 1932. For Mutō’s reforms to the Gokasho farm, see *Mikimoto shinju hatsumei 75 shūnen: 1893-1968* (Mikimoto shinju kaisha, 1968).

⁵⁰² *Shin'en shinju nanajūnen*, pp. 154-155.

surgically nucleating living pearl oysters, female technicians now predominated. In the Gokasho Bay farm, as in other Japanese industries, ideas of rationalization had gone hand in hand with the employment of nimbler female fingers for lower wages.⁵⁰³ When Mutō or Ogihara stepped inside the Gokasho farm's surgery building (they were the only two outside employees regularly allowed such access), they did not see the lines of exclusively male technicians who had operated on living *akoyagai* through the 1920s. Instead they found a surgical ward that had come to be populated by two hundred women and only thirty men.⁵⁰⁴

The growth of cultivation along Gokasho Bay's shores was accompanied by redesigned ways for putting more round pearls onto more silk strings. Before the formation of the 1928 cultivators' association, a portion of Gokasho's pearls had gone to auction in front of a select group of buyers who gathered near Mikimoto's Toba residence. By the early 1930s, some pearls went to the cultivator association's Osaka auction, but most remained in Toba, where Mikimoto built a new pearl processing factory to absorb Gokasho's increased production. Pearls arrived in Toba for sorting, drilling, and stringing into necklaces that could be sold in Japan or sent abroad through Mikimoto's Kobe export office.⁵⁰⁵

⁵⁰³ See, for example, Janet Hunter, *Women and the Labour Market in Japan's Industrialising Economy: The Textile Industry Before the Pacific War* (Routledge, 2004).

⁵⁰⁴ *Shin'en shinju nanajūnen*, p. 154.

⁵⁰⁵ *Mikimoto shinju hatsumei 75 shūnen: 1893-1968*.

Red Tide Rising

Intensification permeated Mikimoto's network of farms. In Gokasho this entailed more shellfish, more mechanization, and new uses for female labor. Mikimoto worked to maintain his overseas image as the preeminent protector of pearl oysters in the Japanese empire. But round-the-clock cultivation produced more than pearls. It revealed risks for shellfish even in the waters of Mikimoto's flagship farm.

One of those risks was the category of "red tide," known by Mikimoto since the late nineteenth century as *akashio*.⁵⁰⁶ *Akashio* became a pressing issue of comparison in the 1930s United States just after the arrival of news about deadly discolored waters in Mikimoto's Gokasho Bay pearl farm. Gokasho Bay existed as a model of cultivation outside the Japanese empire, but it also became part of American debates over the problems that might accompany Japanese shellfish if they were to move to other waters.

In the autumn of 1933, a village fisher working the waters of Gokasho Bay discovered "a dense and distinctly bordered mass of *akashio* with a width of around two meters" near one of the two streams that fed into the northeastern corner of the bay.⁵⁰⁷ Mikimoto's cousin, a pearl fishery technician named Oda Masashichi, added the report to several decades of coastal observations the company had compiled in Gokasho and Ago

⁵⁰⁶ See Chapter 1.

⁵⁰⁷ Oda Masashichi, "Gymnodinium Mikimotoi Miyake et Kominami n. sp. (MS) no akashio to ryūsandō no kōka," *Dōbutsugaku zasshi* n. 47 (1935), p. 36.

Bays. This time, however, discolored waters did not stay limited to just one part of Gokasho Bay, as had often happened in the past.⁵⁰⁸

A group of outside observers visited the Gokasho Bay pearl farm in late January to observe the unusual conditions. Among them were Yatsu Naohide, Oda's mentor and head of the Misaki Marine Zoological Station, and the University of Pennsylvania zoologist Clarence E. McClung. Mikimoto's cousin Oda later wrote that in past cases cultivators and fishers had simply waited for shellfish and other marine creatures to die. This time, he decided to take action after receiving a tip from Yatsu about the pesticide potential of a certain bluish chemical substance. "I put crystalline copper sulfate into a cloth bag and went out onto the water," wrote Oda. He attempted to eliminate the microscopic sources of the discolored water by, as he said, "poisoning them all."⁵⁰⁹

Oda went on to note that soon after his initial experiment he took ten more bags of copper sulfate with him on a motorboat. He unloaded the contents of the bags atop the worst-looking areas. A kilogram of the crystals dissolved in about half an hour, causing any massed microorganisms it contacted to "ball up or become like a sheet floating on the water surface." For three days from the ninth of February, Oda claimed to have added about ninety kilograms of copper sulfate to Gokasho Bay's waters. At that point, he noted,

⁵⁰⁸ Oda Masashichi, "Gymnodinium Mikimotoi Miyake et Kominami n. sp. (MS) no akashio to ryūsandō no kōka," pp. 40-41.

⁵⁰⁹ Oda Masashichi, "Gymnodinium Mikimotoi Miyake et Kominami n. sp. (MS) no akashio to ryūsandō no kōka," p. 45.

the water “had become completely clear.” No harm, so far as he could tell, had befallen the oysters.⁵¹⁰

What prompted this application of blue substances to the sea? It is quite possible that Oda and his mentor Yatsu had both heard about this copper sulfate remedy from their visitor Clarence (C. E.) McClung, who had been spending a fellowship as Rockefeller Visiting Professor at Keiō Medical School in Tokyo.⁵¹¹ Mikimoto employee Ogushi Jirō later hinted that McClung, known for his researches on microscopy and tiny organisms, had mentioned copper sulfate and bleach due to its use in “American oyster culture farms.”⁵¹² A combination of copper sulfate, lime and water called the “Bordeaux mixture” (or *bouillie Bordelaise*) had been well-known since the late-nineteenth century as a fungicide developed for use on the grapevines of southern France.⁵¹³ Similar concoctions found applications in a number of agricultural and aquacultural cases elsewhere. At the Fourth International Fisheries Congress held in 1908, two officials from the United States Bureau of Fisheries advocated “doses” of copper sulfate as a cure for the dense blue-green algae that formed in the bodies of fresh water that supported most of the hatcheries and other fisheries facilities in the United States.⁵¹⁴ Closer to McClung's ken was likely

⁵¹⁰ Oda Masashichi, “Gymnodinium Mikimotoi Miyake et Kominami n. sp. (MS) no akashio to ryūsandō no kōka,” p. 46.

⁵¹¹ “Items of Interest,” *The Collecting Net* n. 9, p. 69.

⁵¹² Ogushi Jirō, *Shinju no kenkyū* (Tokyo: Itō Bunshindō, 1938), p. 88.

⁵¹³ George D. Gale, *Dying on the Vine: How Phylloxera Transformed Wine* (Berkeley: University of California, 2011).

⁵¹⁴ Millard C. Marsh and R. K. Robinson, “The Treatment of Fish-Cultural Waters for the Removal of Algae,” *Bulletin of the Bureau of Fisheries* (1908), pp. 874-890.

something resembling a 1930 report on the use of copper sulfate to eradicate starfish from oyster beds, given at a joint convention of the Oyster Growers and Dealers Association and the National Association of Shellfish Commissioners.⁵¹⁵ In whatever manner McClung may have ferried this information to Mikimoto's pearl farm, it galvanized Mikimoto's employees into initiating a trial course of chemical warfare in Gokasho Bay.

In America, word of Japanese shellfish disease brought with it the specter of possible disease transmission to *edible* oysters. Rumors began to fly in print when the president of the Oyster Growers and Dealers Association of North America sent out a warning about millions of “Japanese oysters” that had perished “due to some undetermined disease.” The president, “fearing that this disease might be transmitted to American oysters,” requested the United States Commissioner of Fisheries to investigate the causes of shellfish mortality in Japan.⁵¹⁶

As Philip Pauly has noted, the late 1910s rise of American biological nativism—directed in part against insects and other “alien crop enemies” that had arrived along with Japanese cherry trees donated by Tokyo city officials—reflected (and in some ways preceded) broader support for 1920s immigration restrictions.⁵¹⁷ Edible oyster cultivators highlighted two related flashpoints of concern in depression-era United States. The first was the implementation of American restrictions on the immigration of foreign shellfish.

⁵¹⁵ Melbourne Romaine Carriker, *Taming of the Oyster: A History of Evolving Shellfisheries and the National Shellfisheries Association* (Groton, CT: The Sheridan Press, 2004), pp. 57-58.

⁵¹⁶ “Japanese Oysters Suffer Mortality,” *Maryland Fisheries* n. 27 (March, 1934), p. 2.

⁵¹⁷ Philip J. Pauly, “The Beauty and Menace of the Japanese Cherry Trees: Conflicting Visions of American Ecological Independence,” *Isis* v. 87 n. 1 (1996), pp. 51-73.

From the early 1930s, a number of U.S. states, including Maryland, began to place embargoes on the importation of edible “Jap oysters” for cultivation along American coastlines. Christine Keiner has shown that although government-affiliated biologists and Chesapeake oystermen held opposing views about privatization (which, as in Mie prefecture, biologists and cultivators generally supported and oyster gatherers generally opposed), both shared 1930s impulses to ban the arrival of non-native mollusks like the *Crassostrea gigas* “Pacific Oyster” according to a oyster species hierarchy that seemed to mirror racial discourses of pure breeds, unfit hybrids, and the nebulous threat of a bivalve yellow peril.⁵¹⁸ The second was a longstanding connection between mollusks and disease. Outbreaks of typhoid in the late nineteenth and early twentieth centuries became linked to the consumption of raw oysters, then one of the most valuable seafood catches in America. Even after the seafood regulations implemented under America's Pure Food and Drug Act of 1906, the popular image of the unsanitary qualities of oysters dissuaded enough people from eating shellfish to prompt the very formation of the National Oyster Growers and Dealers Association two years later in 1908. In late 1924, an oyster-borne typhoid outbreak in major U.S. cities only underscored this danger.⁵¹⁹

In response to the 1934 Oyster Growers and Dealers Association complaint about pearl oysters, the acting United States Commissioner of Fisheries, Charles E. Jackson, echoed some of the opinions stressed at the world's first conference on *akashio* discolored

⁵¹⁸ Christine Keiner, *The Oyster Question: Scientists, Watermen, and Maryland Chesapeake Bay Since 1880* (Athens, Ga.: University of Georgia, 2009), pp. 210-213.

⁵¹⁹ Keiner, *The Oyster Question*, p. 110.

waters, held several weeks earlier in Tokyo and attended by C. E. McClung, Mikimoto, and many of Japan's fisheries and weather scientists. Participants at the Tokyo conference stressed that while *akashio* ravaged pearl "oysters" (*shinjugai*), discolored waters had not affected farms in northeastern Miyagi prefecture that raised entirely different varieties of edible oysters (*kaki*) for shipment to largely Japanese-run farms in Washington state.⁵²⁰ Back in the United States, the Commissioner of Fisheries likewise wrote that the propagation of tiny dinoflagellates, "called in Japan 'red current,'" did not have any relationship to the areas of northeastern Japan from which edible oysters were imported. Although admitting that the present case was "unusual" due to its timing so late in the year, Jackson noted that "the dangers of introducing into our waters the microorganism causing 'red current' appears to be very remote." An informant in Japan—the very same C. E. McClung—assured Jackson that "the organism causing 'red current' is always present in certain sea waters; it is not poisonous, but when occurring in enormous numbers smothers or suffocates the oysters."⁵²¹

For pearl cultivators and their financial backers in Japan, the variability of the water put a premium on the recording and comparison of present and past ocean conditions. Outbreaks of discolored waters in Ago and Gokasho Bays showed no clear trend that might allow one to predict when phenomena classifiable as *akashio* might occur. In that sense, links to other kinds of disaster were also being made clear. At the 1934 *akashio* conference, Yatsu Naohide, the head of the Tokyo Imperial University's

⁵²⁰ "Akashio zadankai," *Kagaku chishiki* v. 14 n. 4 (1934).

⁵²¹ "Japanese Oysters Suffer Mortality," pp. 2-3.

Misaki Zoological Station, argued that “*Akashio* are the same as earthquakes. We need to keep a complete record of past events and be on the lookout for unusual conditions at all times.”⁵²²

Mikimoto and visitors to his farms had long mentioned *akashio* and other saltwater threats to cultivation in English and French language publications. At the end of 1934, American Rotarians read the exploits of one of their Tokyo Rotary Club counterparts when Mikimoto (likely translated into English by his son Ryūzō) recounted a process of pearl cultivation stalked by unforeseen marine hazards:

The cultivation of oyster pearls is fraught with dangers and tribulation. All the perils of the Orient must be faced—the typhoon which comes up suddenly without warning and sweeps away entire colonies of infant oysters. Unexpected thaws of mountain snows pour chilly torrents into the bays and inlets destroying marine life. And again there is always the dreaded *Akashiwo*, a murderous marine parasite which swarms the seas in discolored red currents like locusts which darken the Mongolian landscape, even hiding the sun in their onward rush over crop-denuded fields.⁵²³

Mikimoto’s translated words here brought the continental Asian farming landscapes of Japanese Manchurian settlement together with his bayscapes of pearl cultivation. “All the perils of the Orient” described aquatic dangers that were limited to Mikimoto’s “colonies of infant oysters” in the Japanese empire. However, such accounts glossed over the transnational chemical warfare that had, just months before, turned parts of Gokasho Bay several new shades of blue.

⁵²² “*Akashio zadankai*,” p. 115.

⁵²³ Kokichi Mikimoto, “Farming Oysters for Pearls,” *The Rotarian* v. 45 n. 12 (1934), p. 53. Much of the piece, although not this passage, overlapped with an article published a year earlier in Japanese. Mikimoto Kōkichi, “Yōshoku shinju o tsukuriageru made,” *Chūō kōron* (February 1934).

The South Seas Speed-Up

Elsewhere in the Japanese empire, warmer waters presented opportunities to make shellfish produce pearls faster than they ever had in Gokasho Bay. “Japanese” *akoyagai* were on the move to bays along other Pacific coastlines—as were other varieties that had been seen together with *akoyagai* only in mother-of-pearl shell entrepôts and in the drawers of university and museum mollusk collections.

In early May 1935, the Mie prefecture editions of several newspapers reported that thirty-five thousand living *akoyagai* shellfish gathered from Mikimoto’s Gokasho pearl farm (five thousand of them already surgically nucleated) had embarked upon a nearly three-week-long journey.⁵²⁴ Their destination was the southernmost of Mikimoto’s pearl farms, this one located along bay waters off the Palauan island of Koror, in the Japanese-controlled League of Nations Mandate territories often collectively referred to in Japan as the South Seas Islands (*Nan’yō guntō*). The language surrounding the incoming shellfish was redolent of the contemporaneous fanfare that attended schemes to persuade struggling Japanese farmers to settle in the continental expanses of Manchuria.⁵²⁵ Reporters hinted at the expectations that surrounded the molluscan “pioneers of Japanese pearl oyster expansion into the different world of the South Seas.”⁵²⁶ These *akoyagai* were

⁵²⁴ Ōmura Hajime, “Parao ni okeru shinju yōshoku saku,” *Chirigaku* v. 9 n. 6 (1941), p. 46.

⁵²⁵ Louise Young, *Japan’s Total Empire: Manchuria and the Culture of Wartime Imperialism* (Berkeley: University of California Press, 1998), especially chapters 7 and 8.

⁵²⁶ *Osaka Mainichi Shinbun* (Mie edition), 28 May 1935.

expected to yield the company's flagship spherical pearls "two years faster" than in the metropole.⁵²⁷ In short, the waters of Palau promised a "pearl cultivation speed-up" (*supiido appu*).⁵²⁸

Mikimoto had sent employees to survey Palau since at least the early 1920s and probably before that.⁵²⁹ In 1926 he purchased the *Nan'yō sangyō* company, the first aquacultural venture in Palau when it opened for business in 1917. Mikimoto gained control over the cultivation rights granted to it through the Japanese Mandate government, the *Nan'yō chō*. He continued the previous company's strategy of working with the local *kurochōgai* variety of shellfish, sometimes known in English-speaking circles as "black-edged" pearl oysters because of its darker-hued mantle tissue, which secreted mother-of-pearl (and pearls) of a similar though variable color.⁵³⁰ Since then, Mikimoto's onsite managers had maintained a staff of several technicians. They hired Palauans to gather *kurochōgai* from nearby waters, though by the late 1930s these pearl oysters of this variety were often purchased from fishers in other parts of the islands.⁵³¹

Company pamphlets and newspaper features on Mikimoto's business rarely failed

⁵²⁷ *Osaka Mainichi Shinbun* (Mie edition), 7 May 1935.

⁵²⁸ *Ise Shinbun*, 7 May 1935.

⁵²⁹ Mikimoto's Paris agent Lucien Pohl made reference to Mikimoto's early experiments with black-edged *Margaritifera* varieties (also classed as *Avicula*) in Palau in a 1923 speech at the 8th French congress on fisheries and maritime industries. Lucien Pohl, "Les progrès de la culture de la perle fine."

⁵³⁰ Ogushi Jirō, head of Mikimoto's Palau pearl farm from 1937, wrote that the purchase had happened in May 1926. Ogushi Jirō, *Shinju no kenkyū*, p. 173. A later South Seas fisheries report hints that the acquisition may have been finalized in 1928. Marukawa Hisatoshi, *Nan'yō suisan sōsho* v. 8 (Tokyo: Nan'yō suisan kyōkai, 1940), p. 12.

⁵³¹ Letter from Ogushi Jirō at Palau Pearl Culture Farm to Mikimoto Tokyo Office, June 25, 1939, held in MPIMA.

to announce that the company's pearl farms encompassed millions of pearl oysters spread over a staggering 41,000 acres. Less apparent, however, was that these figures represented vast disparities. Well over ninety percent of Mikimoto's pearl oysters were *akoyagai* living along Mie coastlines.⁵³² "Japanese" *akoyagai* lived in densely-packed conditions, both inside cages and along Mikimoto's contested and shrinking cultivation areas in Mie Prefecture. By contrast, Mikimoto's twelfth farm in Palau accounted, by my calculations, for over ninety percent of the company's stated cultivation acreage of 41,000 acres.⁵³³ If the Palau farm served to bump up Mikimoto's cultivation numbers and stretched the map of his operations, it also existed, at least on paper, as a warmer—and comparatively underpopulated—aquatic pasture for the cultivation of *akoyagai* and other pearl-bearing shellfish varieties.

The idea of a nearly endless (and almost always nebulous) southern Pacific frontier had long served as a trope for Japanese dreams of escape, migration, and expansion.⁵³⁴ From the late nineteenth century, in fact, sojourners, many of them from Wakayama

⁵³² Mikimoto's Palau operations did not deal with more than 100,000 pearl oysters of all varieties each year, in contrast with the five million or more in all twelve farms combined. By 1938, only a little over a hundred thousand "silver-lipped" *Margaritifera maxima* (soon to be introduced in this paper) had been brought from the "outer Nan'yō" (*soto Nan'yō*) to the "inner Nan'yō" (*uchi Nan'yō*) of Japanese-mandated waters in Palau. See Ogushi Jirō, *Shinju no kenkyū*, p. 174.

⁵³³ As of 1922, Mikimoto claimed cultivation rights over around 3.7 million *tsubo* of ocean space in eleven bays in Mie Prefecture (7), Wakayama Prefecture (1), Nagasaki Prefecture (1), Ishikawa Prefecture (1), and Okinawa Prefecture (1). If Mikimoto's stated total of 41,000 acres (or the rough equivalent of 50 million *tsubo*, as was often stated in Japanese-language publications) is roughly accurate, then the twelfth farm at Palau likely accounts for over ninety percent of this total. For the 1922 figures see Ototake Iwazō, *Denki Mikimoto Kōkichi* (Tokyo: 1950), pp. 200-201.

⁵³⁴ See Mark Peattie, *Nan'yo: The Rise and Fall of the Japanese in Micronesia* (Honolulu: University of Hawaii Press, 1988); Robert Tierney, *Tropics of Savagery: The Culture of Japanese Empire in Comparative Frame* (Berkeley: University of California Press, 2010).

Prefecture, began heading to Australia, where they settled on an island known as Thursday. Around Thursday Island and along other parts of the northern and northwestern coasts of Australia at Broome and Darwin, they set out for silver-lipped pearl oysters to be sold as mother-of-pearl for buttons, cutlery handles, and other manufactures.⁵³⁵ Unlike the *ama* divers employed by Mikimoto, male divers in Australia, whether Japanese or not, used air-pumped and helmeted “dress diving” methods rather than their lungs alone for reaching the seafloor. Obtaining pearls was itself not the primary goal of such work, though other people, including most notably the British-Australian fisheries scientist William Saville-Kent, had made several early pearl induction experiments before his death in 1908.⁵³⁶

Even as the pearl oyster gathering activities of the southern hemisphere divers were receiving journalistic attention in Japan, British and French zoologists were cataloguing pearl oyster varieties across the world’s oceans. In 1901, for example, H. Lyster Jameson published his reclassification of the pearl oyster holdings of the British Museum. His study included many of the largest pearl oyster samples he himself had gathered during surveys in British New Guinea and along other shores. To the zoologist’s eye these bivalves formed a species, which from then on took the name *Margaritifera maxima*

⁵³⁵ See Kataoka Chikashi, *Nan'yō no Nihonjin gyogyō* (Tokyo: Dōbunkan, 1991). One interesting early account of the Thursday Island Japanese pearl migrants can be found in South Seas booster Hattori Tōru’s *Nankyū no shinshokumin* (Tokyo: Hakubunkan, 1894).

⁵³⁶ See Anthony James Harrison, *Savant of the Australian Seas: William Saville-Kent (1845-1908) and Australian Fisheries* (Tasmanian Historical Research Association, 1997).

Jameson.⁵³⁷ Jameson's was an attempt to revise classifications of "the common commercial forms" of pearl- and mother-of-pearl-bearing shellfish, as indeed such varieties had long gathered interest that was hard to consider either wholly zoological or wholly economic. Jameson placed the variety known both as "The Pearl-Oyster of Japan" and "The 'Japan lingah shell' of the London markets" into a provisional category of *Margaritifera martensii* applied by Dunker in 1872. However, he retained the suspicion that it might be a smaller "local form" of *Margaritifera vulgaris*, which came in greatest abundance from British-controlled fisheries in Ceylon and Southern India and from the world's largest pearl fishery in the Persian Gulf.⁵³⁸

Japanese observers also began to reassess the position of metropolitan *akoyagai* coastlines as a northern periphery of global pearl oyster biogeography. Following Japan's 1914 occupation of Germany's southern Pacific colonies, a wide range of inquiries and surveys addressed questions about the availability and suitability of warmer "South Seas" waters for pearl induction and other fisheries activities. As one Japanese government report noted around 1918, the advantages of pearl oyster cultivation in formerly German-controlled South Seas coastlines were manifest: "In high water temperatures, shellfish secrete layers of mother-of-pearl without rest. As a result, whereas in the metropole it would take three or four years to get a pearl after inserting a nucleus, in the *Nan'yō* it

⁵³⁷ H. Lyster Jameson, "On the Identity and Distribution of the Mother-of-Pearl Oysters; with a Revision of the Subgenus *Margaritifera*," *Proceedings of the Zoological Society of London* 70 issue 2 (August 1901): 372-394.

⁵³⁸ H. Lyster Jameson, "On the Identity and Distribution of the Mother-of-Pearl Oysters" (1901), p. 386.

should take one-third that time.”⁵³⁹

Mikimoto, for his part, looked to apply methods of pearl induction to the largest variety of “silver-lipped” *shirochōgai*, H. Lyster Jameson’s *Margaritifera maxima*, which lived along shores outside Japanese control throughout the southern Pacific. One of Mikimoto’s first overtures had been to the American colonial government in the Philippines. Mikimoto targeted waters along parts of Mindanao that were becoming areas for Japanese settlers looking to grow *abacá* (*Musa textilis*) for rope fibers and other products. From the early 1900s the movement of such settlers had been facilitated by tenant farming arrangements overseen by the Ohta Development Company.⁵⁴⁰ Mikimoto turned to the company as well. Ohta addressed an English-language letter on Mikimoto’s behalf to Frank Carpenter, the American Governor of Mindanao and Sulu, excerpted here without copy editing:

Mr. K. Mikimoto has been lucky enough in obtaining the knowledge of cultivation of pearls and pearl-oysters that thrive in Japan...This species has a small and thin shell, and produces a superior kind of pearls. Only defect with them is that they are small in size for their mother shells have small thin shells. He has been ever thinking of applying his original method of pearl-cultivation with the large species of the tropical waters. It was few years ago that he began the experiment at Loo Choo Islands. In the experimental farm, he cultivate *Margaritifera margaritifera*, D. and culture-pearls have been produced in them. He regret that he has had no access to try his experiments with the best species of the pearl-oysters *Margaritifera maxima*, Jameson.⁵⁴¹

As the Ohta Development Company request indicated, Mikimoto’s employees had

⁵³⁹ *Tsuchiya kaigun chūshō ichigyō* (3). Accessed through the Japan Center for Asian Historical Records (JACAR). Reference Code C10128153200.

⁵⁴⁰ Grant K. Goodman, *Davao: A Case Study in Japan-Philippine Relations* (Kansas City: The University of Kansas Press, 1967).

⁵⁴¹ Letter from the Manila Office of the Ohta Development Company to Governor Frank W. Carpenter, Department of Mindanao & Sulu, Philippine Islands, March 18, 1915. Gaimushō, “Hitō ni oite hōjin no shinju yōshokugyō kaishi keikaku ni kansuru ken.” Accessed through JACAR. Reference Code B11091927100.

already begun to work along the shores of Okinawa Prefecture's Ishigaki Island, at times referred to in Japanese and in other languages by the name of the kingdom that formerly claimed suzerainty over Ishigaki and other islands in the Yaeyama archipelago, Ryūkyū (or the then-common sinicized English-language moniker of "Loo Choo").

The problem in the Philippines and in Australia, however, was that officials were growing hostile to Japanese migration and the possibility of commercial, and perhaps even naval, encroachment. In Australia, opposition to Japanese settlement combined with the threat of pearl and pearl oyster cultivation. To the Australian members of mother-of-pearl industry associations in Western Australia and elsewhere, cultivation had the potential to undercut or even expand to encompass existing areas of pearl oyster gathering. The government of Western Australia banned pearl and pearl oyster cultivation activities outright with the 1922 Pearling Act, a piece of legislation that took force amid rumors of attempts during the following year to shepherd Japanese pearl surgeons to Australian shores.⁵⁴² Even so, the prospect of silver-lipped pearl oyster farms continued to intrigue some in the Australian federal government. Indeed, using Australian shellfish seemed to some like a way to improve upon Japanese *akoyagai* pearl cultivation. "The Japanese export trade in culture pearls exceeds £1,000,000 per annum," remarked a 1926 report from the Australian Advisory Council for Science and Industry. "The natural pearls obtained in Australia are vastly superior to the Japanese natural pearls, and it is thought that in a like manner pearls cultured in Australia would be

⁵⁴² Ronald Moore, "The Management of the Western Australian Pearling Industry, 1860 to the 1930s," *The Great Circle* 16 no. 2 (1994), p. 134.

superior to those of Japanese origin, if that were found to be the case the trade now going to Japan would be diverted to the Australian Industry.”⁵⁴³

Even as Mikimoto sought coastlines with access to the largest pearl oysters, those shellfish were often shielded from Japanese attempts to gather and cultivate them. The one Japanese exception was a Mitsubishi-funded venture headed by Fujita Masayo’s older brother Sukeyo, a Tokyo Imperial University-trained former Fisheries Bureau official. Like Masayo, Sukeyo had firsthand experience in Nishikawa Tōkichi’s efforts to develop *akoyagai*-based spherical pearl cultivation methods at the Misaki Zoological Station. After being rebuffed in the Philippines like Mikimoto, in 1920 Fujita Sukeyo negotiated access to waters off the island of Boeton in the Dutch-controlled Celebes, in what is now a part of Indonesia.⁵⁴⁴ There he and his small staff gathered nearby silver-lipped pearl oysters and focused their efforts on inducing them to produce pearls. At the time of Fujita Sukeyo’s death in 1932, the company, subsequently reorganized within the Mitsubishi Company’s holdings as the South Seas Pearl Company (the *Nan’yō shinju kaisha*), had begun to produce cultivated spherical pearls from silver-lipped oysters on a small but profitable basis.⁵⁴⁵

But a consistent problem, as elsewhere in the southern Pacific, was maintaining access to pearl oyster beds. The company’s fishing rights agreement with the Dutch

⁵⁴³ “Advisory Council of Science and Industry. Pearl shell industry and cultured pearls.” National Archives of Australia (NAA), reference Code A8510, 68/186.

⁵⁴⁴ *Mitsubishi shashi dai 11 satsu dai 27 kan* (1920), p. 5212.

⁵⁴⁵ *Shirochō shinju yōshokujigyō no gaiyō* (1935), held in Mitsubishi shiryōkan (MS).

specified that the only *shirochōgai* available for collection were those that could be found within 3 miles of its leased seafloors.⁵⁴⁶ Other nearby shores were legally off-limits. The company hoped to nucleate around ten thousand pearl oysters per year; only around eight thousand or so could be found annually.⁵⁴⁷ In 1935, the company made an agreement with Tange Fukutarō, a native of Wakayama prefecture who was one of the first Japanese boat-owning entrepreneurs to get into long-distance shell gathering in the early 1930s. Tange promised to bring back thousands of living *shirochōgai* from the Aru Islands.⁵⁴⁸ Long-distance contracts allowed cultivators to avoid the dangers of being caught gathering shellfish where they faced legal prohibitions. At the same time, it shifted the problem of avoiding Dutch, Australian, and British coastal patrols from pearl cultivators to lugger owners. But as in Australia more than a decade before, the Dutch government began to cast suspicious eyes upon the South Seas Pearl Company and other Japanese-owned businesses in its territories. The South Seas Pearl Company's 1935 annual report hinted at this, remarking that "Applying our countrymen's unique technical skills within [Japanese] Imperial territory would also lead to great increases in national wealth."⁵⁴⁹ Several of the company's employees left in 1936 in order to set up a second pearl farm near Koror in Palau, where they joined three other cultivation ventures—

⁵⁴⁶ *Mitsubishi shashi dai 11 satsu dai 27 kan* (1920), p. 5212.

⁵⁴⁷ Ikeda Minoru, *Shirochō shinju oidachi no ki* (1979), p. 5, held in Mitsubishi shiryōkan (MS).

⁵⁴⁸ Ikeda Minoru, *Shirochō shinju oidachi no ki*, held in MS.

⁵⁴⁹ *Shirochō shinju yōshokujigyō no gaiyō* (1935), p. 8, held in MS.

including, of course, Mikimoto's.⁵⁵⁰

The “northern” *akoyagai* that arrived in Mikimoto's Palau farm in 1935 shared those waters with another group of new arrivals that had come from nearly the opposite direction: several thousand *shirochōgai* from the Arafura Sea, gathered by a refitted shell lugger somewhere off the northwest coast of Australia and purchased by Mikimoto's employees for around three yen apiece.⁵⁵¹ Like the much smaller *akoyagai*, the dinner-plate-sized *shirochōgai*—the world's largest producer of marketable pearls, as hinted in the English translation of its Latin names, *Margaritifera maxima*—had rarely if ever been recorded alive along Palau's shores. And never before had living *akoyagai* and *chōgai* varieties appeared together in close proximity. The manager of the Palau Mikimoto farm, a Mr. Nakasugi, was said to be looking forward to side-by-side studies of their “powers of production.”⁵⁵²

The silver-lipped shellfish that came to Mikimoto's Palau pearl farm were part of a broader state effort to integrate a range of longer- and shorter-term settlers in the South Seas: pearl divers and boat operators, biological researchers, and pearl cultivators. The Palau Tropical Biological Station, the only state-supported scientific research facility in Japan's South Seas territories, had also just opened its doors in 1935.⁵⁵³ A zoologist writing

⁵⁵⁰ *Shirochō shinju yōshokujigyō no gaiyō* (1937), held in MS.

⁵⁵¹ At Mikimoto's Palau farm, prices depended on the size of each individual *shirochōgai* but were “around three yen.” Ogushi Jirō, *Shinju no kenkyū*, p. 174.

⁵⁵² *Osaka Mainichi Shinbun* (Mie edition), May 28, 1935.

⁵⁵³ The standard work on the Palau Tropical Biological Station is Sakano Tōru, “Parao nettai seibutsu kenkyūjo: sono tanjō kara shūen made,” *Kagakushi kenkyū* v. 22 (1995): 180-196.

a few years later would recall that “if you exit the Palau Tropical Biological Station, turn right, and walk two blocks down, you will reach the Mikimoto cultivation farm.”⁵⁵⁴ The biological station received new researchers from Japan every two or three months, some of whom reported on the pearl cultivation activities taking place in the bays. Ogushi Jirō, who became head of Mikimoto’s Palau farm in 1937, worked especially closely with the biologists at the tropical station.⁵⁵⁵ (So too did at least one employee from the South Seas Pearl Company’s Palau farm.)⁵⁵⁶

By the late 1930s, Palau had become a center of the mother-of-pearl trade as in no other time before or since.⁵⁵⁷ The capital of Koror was a boomtown; the number of Japanese incomers to Palau overtook the local population.⁵⁵⁸ Phosphate fertilizers, sugar, Pacific finfish, and *shirochōgai* shells arrived ready for packaging, canning, and boxing before reshipment to Kobe and other ports in the metropole.⁵⁵⁹ Commentators at the time pointed to the change that had taken place around 1936, when the number of Palau-based pearl shell luggers began to increase dramatically.⁵⁶⁰ Nothing excited pearl

⁵⁵⁴ Marukawa Hisatoshi, *Nan’yō suisan sōsho* v. 8 (Tokyo: Nan’yō suisan kyōkai, 1940), p. 12.

⁵⁵⁵ Dōmoto Teiichi, head of the *Nan’yō chō* division of internal affairs (*naimu*), wrote a preface to Ogushi’s 1938 pearl study in which he compared Ogushi’s pearl cultivation activities to the research on coral, plankton and algae, and tropical fish being carried out by academic visitors to the Palau Tropical Biological Station.

⁵⁵⁶ Sakano Tōru, “Parao nettai seibutsu kenkyūjo.”

⁵⁵⁷ Paul M. Ehrlich, *Koror: A Center of Power, Commerce, and Colonial Administration* (Saipan: Micronesian Archaeological Survey Report Number 11, 1984). Peattie, *Nan’yo*.

⁵⁵⁸ See for example Ehrlich, *Koror*, pp. 44-52.

⁵⁵⁹ Peattie, *Nan’yo*.

⁵⁶⁰ In 1936 there were 81 Palau-based pearl luggers bringing 2,200 tons of shell into port. As Ogushi Jirō, the then-head of Mikimoto’s Palau pearl farm put in 1938, “In recent years Palau has increasingly become a

cultivators more than the possibility of bringing in a steady number of live *shirochōgai* pearl oysters along with the millions of husked shells that came each year. And as was also becoming clear, there were possibilities for incorporating multiple shellfish species into a Mikimoto method of pearl cultivation.

2. Reengineering the Waters of Ago Bay

In Ago Bay, financial crisis opened up a different world of opportunities and challenges for Mikimoto's pearl cultivating and pearl buying competitors. At the end of 1931, finance minister Takahashi Korekiyo spearheaded Japan's re-embargo of gold exports after nearly two years on the gold standard. The dollar value of the yen promptly dropped over fifty percent.⁵⁶¹ New cultivators and new buyers appeared amid growing demand for newly discounted spherical cultured pearls. The post-yen devaluation rise of pearl cultivation was more visible in Ago Bay, next door to Mikimoto's biggest Gokasho Bay farm, than anywhere else in the Japanese empire. But this development was not simply an outgrowth of Japanese monetary policy; rather, it occurred amid depression-era public works projects that reshaped Japan's first bayscape of pearl cultivation.

The early-to-mid 1930s were marked by worldwide depression, but the Japanese state and villages alike also came to see these years as a distinctively *rural* time of crisis. Actively reformist impulses, often aimed paradoxically at the preservation of village ways

center for the pearl shell gathering industry, in which boats leave Palau for foreign territories (*gaikokuryō*) and international waters (*kōkai*).“ Ogushi Jirō, *Shinju no kenkyū*.

⁵⁶¹ See Mark Metzler, *Lever of Empire: The International Gold Standard and the Crisis of Liberalism in Prewar Japan* (University of California, 2005).

of life, worked in interlinked ways at national, prefectural, and village levels.⁵⁶² Coastal fishing associations and their villages were part of these efforts as well. Global depression highlighted just how important pearl cultivation had become to a large swath of Ago Bay's residents, not just Mikimoto's company.

It was in such a context that in April 1931 the governor of Mie prefecture authorized a 135,000 yen expenditure for the construction of a canal between the Ago Bay villages of Katada and Funakoshi, where local leaders had spearheaded efforts to make a formal construction request.⁵⁶³ The villages joined at the narrowest point along the long east-west peninsula that created a physical and linguistic barrier between inner Ago Bay waters to the north (the *naikai* or *wankai*) and those of the outer Pacific Ocean to the south (the *gaikai*). It was a place near which Mikimoto had once operated a morning and evening ferry service between Tatoku Island and the peninsular villages where many of his young female divers lived: not just Katada and Funakoshi but also places like nearby Wagu and Koshika.⁵⁶⁴ Now it was where the Taishō Construction Company, based in the town of Yamada near Ise Shrine, oversaw the digging and concrete reinforcement of a 660-meter-long, 15-meter-wide waterway thereafter known as the Fukaya canal (*Fukaya suidō*).⁵⁶⁵

⁵⁶² Kerry Smith, *A Time of Crisis: Japan, the Great Depression, and Rural Revitalization* (Harvard University Asia Center, 2001).

⁵⁶³ Sogabe Ichita, *Shimagun shi* (Mie ken kyōdo shiryō kankōkai, 1975), p. 104.

⁵⁶⁴ "Yōshoku shinju to Mikimoto ō," p. 57.

⁵⁶⁵ Sogabe, *Shimagun shi*, p. 104. Another of the canal's proposed functions was to give offshore fishers in those villages easier access to the Pacific while also providing them safer ports in the inner bay.

The Fukaya canal was, in part, a response to the 1926 cold waters that had killed one million of Mikimoto's pearl oysters and doubtless many millions more. Along with decades-long observations of discolored water, a pattern of pearl oyster deaths in cold water was emerging throughout Japan. Water temperatures seemed to change suddenly and locally in parts of individual bays. The phenomenon became known, like the "red current" *akashio*, as the "cold current" or *reichō* 冷潮.

Cold current damage had been especially severe in Nagasaki's Ōmura Bay, where the winter of 1917 had taken the lives of many if not most of the shellfish at one of Mikimoto's largest competitors, the Ōmura Bay Pearl Company.⁵⁶⁶ Accumulating experience with pearl oyster disaster and the growing historical consciousness of the threat it posed to the saltwater economy of pearl cultivation shaped responses to changes in bay waters. In Mie Prefecture, the memory of the 1926 Ago Bay pearl oyster disaster spurred research into the problem of cold currents. Fisheries scientists at the prefecture's experimental fisheries station put *akoyagai* ranging from one to five years of age in several cages, which they then suspended alongside self-recording thermometers (*jiki kandankei*) in thirteen areas where fishing associations and other cultivators worked with pearl oysters in Ago Bay. After four years of observations, the station concluded in early 1932 that *akoyagai* faced a clear and measurable danger from cold water. As one newspaper headline put it, "At a temperature of 7 degrees [Celsius], pearl oysters die. At 8 degrees, they are just barely safe."⁵⁶⁷ This relationship had been established with two

⁵⁶⁶ Ōmurawan shinju kabushikigaisha, *Eigyō hōkokusho* (1918), p. 1, in author's possession.

⁵⁶⁷ *Osaka Mainichi Shinbun* (Mie edition), 16 January 1932.

kinds of recording instruments: living shellfish and less sentient thermometric apparatus. If shellfish were observed alive at a recorded temperature of 8 degrees but observed to be dead at 7 degrees, the practical question was how to avoid having oysters and 7-degree-or-below water in the same place at the same time. Observers at the prefectural experimental fisheries station recounted in the early 1930s that even during the disastrous cold current of 1926, waters at the mouth of Ago Bay had been as high as 13 or 14 degrees Celsius, well above the newly-established 8-degree borderline of *akoyagai* physiology; the lowest and most dangerous temperatures had been well inside the Bay, where Mikimoto and other cultivators kept the bulk of their pearl oysters.⁵⁶⁸

Even with agreement that waters below a certain temperature might kill pearl oysters, not all pearl cultivators had the same options to act. Nor did they all experience cold currents as deadly events in their specific part of the bay. In broad terms, two responses presented themselves. The first was to take advantage of differences in ocean temperatures within and outside the bay. With the mobility enabled by his raft-and-cage system in mind, in the summer of 1932 Mikimoto secured a twelve-year lease of ocean space from the Goza village fishing association near the mouth of Ago Bay at “Squid Inlet,” or *Ika-no-ura*.⁵⁶⁹ Mikimoto planned this warmer-water space, better fed by the waters of the *kuroshio* black current moving north along Japan’s Pacific coast, as an

⁵⁶⁸ *Osaka Mainichi Shinbun* (Mie edition), 16 January 1932.

⁵⁶⁹ *Osaka Asahi Shinbun* (Mie edition), 6 July 1932.

“evacuation area” (*hinanchi*) to which his caged inner bay pearl oysters could be towed and left in suspension during the winter months.

But evacuation was only one response. A second possibility was in some ways far more radical: to re-engineer the waters of Ago Bay itself. The Fukaya canal promised to give warmer Pacific waters a shorter path into the inner part of the bay.⁵⁷⁰ The months of late 1932 and early 1933 provided an immediate test of the canal’s effects on the recently established 8-degree line. By December, the thermometers in waters around the mouth of the bay gave readings of precisely eight degrees, far lower than anything measured in the same area during the 1926 cold current. This was safe for the *akoyagai*, according to the rubric established by the prefectural fisheries station, but virtually all cultivated pearl oysters lived inside demarcated fisheries located along the inner bay, where temperatures could be expected to go far lower. Newspapers reported that Mikimoto continued to evacuate *akoyagai*. Fukaya canal, it seemed, was having little effect on temperatures in the bay.⁵⁷¹ Yet even during the colds of February, the impending catastrophe had still not materialized. The fisheries station reported that the inner bay’s waters registered similar “safe” temperatures to those in the mouth of the bay—a rather different situation from the huge water temperature disparities observed in 1926.⁵⁷² Any earlier doubts about the Fukaya canal’s effects on the bay appeared to have been ill-founded. A new conclusion

⁵⁷⁰ It also promised to make the inner bay a more enticing location for harboring fishing vessels.

⁵⁷¹ *Osaka Mainichi Shinbun* (Mie edition), 23 December 1932.

⁵⁷² *Ise Shinbun*, 1 February 1933.

quickly found publication: the “purple waters of the Pacific” had neutralized the cold current.⁵⁷³

In the immediate aftermath of the Fukaya canal’s success, cultivators in other prefectures started to look anew at Ago as a place to base their pearl businesses.⁵⁷⁴ By the following year, Ago Bay villages hosted more than seventy cultivators in total, more than two-thirds of Japan’s cultivator population.⁵⁷⁵ Few Ago Bay villages changed more than Funakoshi, one of the villages alongside which the new canal ran. Funakoshi had hosted sporadic cultivation ventures since 1904, when a barrel merchant named Nakayama Shunnosuke gave the pearling life a brief go after selling some of his containers to Mikimoto. Outside Mikimoto’s contested fisheries in the northern part of Ago Bay, distinctions between demarcated fishery rights (*kukaku gyogyōken*) and village exclusive rights (*sen’yō gyogyōken*) were observed more often in the breach: by the early 1930s twenty or so cultivators (around half from outside the village proper) were using village waters for raising pearl oysters.⁵⁷⁶ The completion of the new waterway, however, prompted Funakoshi to formalize its claims over cultivation. “The opening of the Fukaya canal has resulted in a rush of new cultivators, and thus we find it necessary to apply for a

⁵⁷³ “Shinjuwan kara murasaki no Taiheiyō e!” 9 March 1933, newspaper article (source newspaper not listed), MPIMA.

⁵⁷⁴ “Shinjuwan kara murasaki no Taiheiyō e!”

⁵⁷⁵ *Ise Shinbun*, 5 February 1933.

⁵⁷⁶ Nakata Minoru, “Shinju yōshokugyō no dōnyū to engan gyoson no hen’yō: Mie ken Shimagun Daiōmachi Funakoshi,” *Aichi daigaku bungaku ronsō* v. 32 n. 3 (1966), pp. 81-82.

demarcated fishery,” recorded the village fishing association during a general meeting held in November 1932.⁵⁷⁷

The Fukaya canal transformed the pearl oyster economy of Ago Bay. The sense of victory over cold current in Ago Bay, however, was part of the ebb and flow of problems and solutions that followed attempts at continuous pearl monoculture. Between 1926 and 1936 the total number of cultivators increased from 33 to 258; the bulk of that increase was in Ago Bay.⁵⁷⁸ The new generation of cultivators entered the business at a different time in the life of Japan’s pearl cultivation patents. Early twentieth century attempts at cultivating semi-spherical pearls left newcomers open to criminal patent infringement charges from Mikimoto. By the early 1930s, a new cultivator did not necessarily have to go through official association channels to license patented methods. Some surely did follow the association’s one-sen-per-oyster patent licensing fee structure. But in practice a new cultivator could simply hire a technician skilled in the arts of shellfish surgery, without asking about (or in fact without knowing anything about) the vagaries of patent law.

Virtually all cultivators came to the water having pursued other lines of landed work.⁵⁷⁹ Indeed, the new generation of Ago cultivators included a number of speculators who had not previously worked as a fisher or marine cultivator as such. But others saw the chance to become an independent smallholder after having worked for established

⁵⁷⁷ Nakata Minoru, “Shinju yōshokugyō no dōnyū to engan gyoson no hen’yō: Mie ken Shimagun Daiōmachi Funakoshi,” *Aichi daigaku bungaku ronsō* v. 32 n. 3 (1966), p. 82.

⁵⁷⁸ These statistics are compiled in Uraki Shin’ichi, *Shinju no keizaiteki kenkyū* (Tokyo: Tokyo daigaku shuppankai, 1970), p. 107.

⁵⁷⁹ See Nakata Minoru’s chart of new cultivators’ former occupations in “Shinju yōshokugyō no dōnyū to engan gyoson no hen’yō.”

cultivators and exporters. Among this latter type was Kakuta Kazō, who had worked for several years in Mikimoto's employ before becoming a pearl broker. As someone who had traveled between Ago Bay and Kobe on behalf of foreign buyers, Kakuta observed firsthand the changes taking place in the bay and quickly moved to speculate on cultivation rights. In 1933 he started a pearl farm in waters off the village of Katada, on the other side of the Fukaya canal from Funakoshi. Cultivators like Kakuta paid fishing associations for access to demarcated fishery space, but they also looked to villages for *akoyagai* shellfish taken from villages' catch-and-gather fisheries and demarcated pearl oyster farms.⁵⁸⁰ *Ama* divers fueled the provision of living pearl oysters to the new generation of cultivators. In Ago Bay, they did so through the mediation of village fishing associations and outside buyers. Fishing associations regulated the sale of pearl oysters gathered by divers from inside and outside the village during the diving season, which lasted from April to October (including periods during which diving was restricted and with some local variation). Five to ten percent of a sale typically went to *ama* once a fishing association and a buyer reached a price.⁵⁸¹ Where fishing associations raised pearl oysters for live sale in demarcated farms—as in the village of Hamajima, which supplied many of its oysters to Mikimoto—divers often received a fee based on the weight of the pearl oysters they brought up from the seafloor.⁵⁸²

⁵⁸⁰ *Shin'en shinju nanajūnen*, p. 74.

⁵⁸¹ Ōhara shakai mondai kenkyūjo, ed., *Honpō rōdōsha oyobi nōmin jijō Shōwa 9-nendo* [1934] (Tokyo: Kurita shoten, 1935).

⁵⁸² See, for example, *Hamajima gyogyō kyōdō kumiai no ayumi* (1991), pp. 68, 104.

The 1930s spread of the pearl oyster trade brought with it interest from Japanese social scientists who sought to observe, compare, and reform labor conditions across the empire.⁵⁸³ Studies of *ama* divers in Mie prefecture's Shima region suggested that marine product gathering was an important source of income in *ama* households. This was especially true along Ago Bay's southern peninsula, stretching from the village of Funakiri to the village of Goza. As central as *ama* divers were to Mikimoto's public portrayal of his cultivation activities, and as important as they would be in other pearl purveyors' advertising, pearl oysters were only one among a range of marine creatures—including abalone, seaweeds, and other kinds of shellfish and crustaceans—for which *ama* divers received cash payments. Importantly, most of a typical diver's income came from the gathering not of pearl oysters but rather of other kinds of marine plants and animals. Two or even three divers might reside in a single household and account for two-thirds of a total income of 300 yen or so. Nevertheless, this was an amount that, as a report by the (then Osaka-based) Ōhara Institute for Social Research noted, supported "a lifestyle level far lower than that of an urban laborer."⁵⁸⁴

Prices for living *akoyagai* pearl oysters fell throughout the 1930s as more village fishing associations established cooperatives to market them; there were 43 in Ago Bay's Shima district alone in 1934. Mikimoto employee Ogushi Jirō wrote of the change in pearl oyster prices between the 1920s and 1930s that "at one time prices reached seven to ten

⁵⁸³ "Ama" *rōdō jijō* (Nagoya chihō shokugyō shōkai jimukyoku, 1934).

⁵⁸⁴ Ōhara shakai mondai kenkyūjo, ed., *Honpō rōdōsha oyobi nōmin jijō Shōwa 9-nendo* [1934] (Tokyo: Kurita shoten, 1935), p. 73.

yen per *kan* (3.75 kilograms), but now they are between one and three yen.”⁵⁸⁵ One Mie geographer estimated in 1937 that ninety-six percent of the twenty-three million-plus pearl oysters then employed in Japanese pearl cultivation came from the prefecture’s waters.⁵⁸⁶ The vast majority could be found in Ago Bay, which received the nickname “Pearl Harbor” (*Shinjuwan*) in newspapers and in tourist flyers for the train line that extended close to its shores.⁵⁸⁷

The Kobe Connection

The growth of lower-cost pearl cultivation inside Mikimoto’s network of farms—and, in many cases, outside the national cultivator association’s guidelines—was accompanied by the increasing prominence of Kobe as a cultured pearl entrepôt. The port city linked coastal farms with pearl processors, pearl brokers, and wholesalers from around the world.

When Kakuta Kazō first came to Kobe as a pearl broker around 1930, he found clients among the city’s foreign importers and exporters. A Syrian (Kakuta referred to him as Indian) importer of diamonds and Mexican opals and Italian exporters of coral from the Seto Inland Sea all turned to brokers like Kakuta for supplies of cultured pearls.

Others accepted orders from representatives associated with the Paris Chambre Syndicale

⁵⁸⁵ Ogushi Jirō, *Shinju no kenkyū*.

⁵⁸⁶ Geographer Tsujii Kōtarō claimed that 23.06 million out of 23.90 million shellfish in total were living in Mie. See Tsujii Kōtarō, “Mie-ken ni okeru shinju yōshoku no chirigakuteki kenkyū (1),” *Chiri kyōiku* 26 (April 1937), p. 65.

⁵⁸⁷ “Shinjuwan kara murasaki no Taiheiyō e!” in MPIMA.

des Perles Fines de Culture, a new syndicate that had emerged in the wake of the pearl trials.⁵⁸⁸ Colonial Taiwanese, German, Italian and, as we will see in greater detail in the following chapter, American buyers all appeared in Kobe as well.

The activities of a Japanese broker followed the arrival of foreign buyers in the fall and continued until their return the following summer. Many of these new linkages between broker and exporter formed outside the purview of the association and its auction system. Brokers, in turn, operated through contacts with cultivators. An Osaka broker named Kawaguchi Kenjirō, whom Kakuta later referred to as having been “an incredibly wealthy man,” was among the brokers who targeted precisely the pearls that some cultivators did not feel were worth selling.⁵⁸⁹ As Kawaguchi himself later put it, there were two ways to buy pearls. The first was to meet directly with cultivators and make offers for pearls in the northern Ago Bay island of Kashikojima, at the terminal of the rail line that ran south from Toba. The second way was to bid on pearl oysters while they were still in the water.⁵⁹⁰ The key, in either case, was to find cultivators before their pearls reached auction in Kobe or Osaka.

Whether purchased in sorted parcels or later plucked from living shellfish, pearls and their brokers next moved to Kobe. The most controversial step in new cultured pearl buying patterns was the emergence of Kobe-based processors who specialized in whitening pearls in order to conceal surface blemishes. Specialists in the new trade had

⁵⁸⁸ *Shin'en shinju nanajūnen*, p. 74.

⁵⁸⁹ *Shin'en shinju nanajūnen*, p. 74.

⁵⁹⁰ *Shin'en shinju nanajūnen*, p. 125.

first learned methods for oxidizing pearls, it was said, from Italian dealers in coral, another variety of calcium-carbonate-based marine object of adornment.⁵⁹¹ Whitening did more than make the unsellable sellable. It also served to adjust and standardize hues to match what many foreign exporters saw as geographically specific color preferences for pinkish, yellowish, or whitish pearls. Whether a cultured pearl was marketable when it first left the water did not always stop it from changing hands eventually. Nor was it necessarily a problem for Mikimoto, who also adopted whitening methods.

Most foreign exporters dealt in cultured pearls as a sideline to other trading activities, just as some of them, including the family of Lucien Pohl in Yokohama, had done since the turn of the twentieth century. By the early 1930s, around two dozen exporters had appeared, as had a similar number of Japanese brokers, all of whom competed to purchase pearls sent by cultivators throughout Japan.⁵⁹² Kobe was their clearinghouse, a place where pearls—whitened, drilled, and strung—became pearl necklaces.

Good Pearls and Bad Pearls

Pearl sales did not funnel through a single channel. Rather, as we have seen, the city of Kobe alone came to house a complex array of buying and selling arrangements. As far as many contemporaneous observers were concerned, the second-generation pearl cultivator association, and by extension its policing functions, existed “in name only”

⁵⁹¹ *Shin'en shinju nanajūnen*, p. 74.

⁵⁹² *Shin'en shinju nanajūnen*, p. 74.

(*yūmei mujitsu*).⁵⁹³ In May 1932, Mikimoto spearheaded the reorganization of the pearl cultivator association under a new name: the *Nihon Yōshoku Shinju Suisan Kumiai* (the Japan Cultured Pearl Fisheries Association). Cooperation through patent sharing no longer framed the alliance of cultivators.⁵⁹⁴ As a state-authorized commercial fisheries association (*suisan kumiai*), the new organization gained the power, at least in principle, to make newcomers join them, to have all cultivators submit their pearls for testing, and to destroy any pearls that failed to make the grade. Leadership shifted from Mikimoto's brother Saitō Shinkichi to Mikimoto himself.⁵⁹⁵

Mikimoto launched the new association several months later in front of Kobe's Chamber of Commerce. Clothed in a *hakama* and a bowler hat, he shoveled scoopfuls of pearls into flames that leapt from a metal barrel. Within hours, 720,000 "bad" pearls had gone up in smoke.⁵⁹⁶ Mikimoto's pearl burning soon took its place among other 1930s responses to diagnoses of agricultural overproduction in Brazil's coffee exporting states and America's corn and pig farming centers. "Burning a surplus is not an original idea, although this is the first time pearls have been burned because there were too many," wrote one columnist in the *Boston Globe*.⁵⁹⁷ As Mikimoto himself put it, "Burning bad

⁵⁹³ *Ise chōhō*, 4 May 1932, MPIMA.

⁵⁹⁴ The locus of licensing for the 1916 and 1917 Nishikawa patents—the first of which (and perhaps the second) received a five-year term extension in 1931—moved from the association to a spun-off but related patent management association.

⁵⁹⁵ Ozeki Nobuaki, "Senzen ni okeru shinju dantai no henshen."

⁵⁹⁶ Mikimoto and the NYSSK referred to them by a variety of epithets that emphasized badness (*furyōhin* 不良品), shoddiness (*soakuhin* 粗悪品), or their post-inspection status as "discards" (*haikihin* 廃棄品).

⁵⁹⁷ *The Daily Boston Globe*, 13 October 1932.

pearls today will show that no bad pearls will leave from now on.”⁵⁹⁸ The performance of Mikimoto’s pearl industry leadership reached a domestic audience of cultivators and an overseas audience of buyers. It was also a display of his attempts to be a market mover. Mikimoto floated calculations hinting that the price of pearls from Japan would go up by thirty percent after the burning—news that was duly reported overseas as well.⁵⁹⁹

However, the Kobe pearl burning obscured fundamental problems. The foremost of these was, as we have seen in Gokasho Bay, that cultivation quotas did not in practice restrict cultivation. Mikimoto’s stated annual quota of 300,000 pearl oysters nucleated according to the Nishikawa method does not bear scrutiny of contemporaneous claims of millions of pearl oyster surgeries. It was a level of production made possible through the adoption of what was by all accounts a far more reliable Nishikawa method than the needle-and-silk-thread sutures required by the method first developed in part by Kuwabara Otokichi, a dentist by training who had once been in Mikimoto’s employ.⁶⁰⁰ Other cultivators neglected to report discrepancies from their quotas as well. Under the terms of the new association a cultivator who attempted to start up a new pearl farm close to other existing farms had to gain the approval of those neighbors. Newcomers had to agree not to operate on behalf of silent owners, not to steal other pearl cultivator’s technicians, and to agree to production regulations. Yet even with the new association’s

⁵⁹⁸ *Kōbe yūshin nippō*, 11 October 1932, MPIMA.

⁵⁹⁹ *Kōbe yūshin nippō*, 11 October 1932, MPIMA.

⁶⁰⁰ *Mikimoto shinju 100 nenshi* (1994), p. 68.

detailed regulations, overall production continued to increase.⁶⁰¹ Pearls fetched lower and lower prices at cultivator association auctions held between 1928 and 1939.⁶⁰²

Cultivation was increasingly possible for smallholders, but the rush to repay debts also gave incentives to shorten the amount of time surgically manipulated pearl oysters spent in the water:

During these past few years, cultured pearls have been selling like crazy overseas amid the mantra of depression. Nowadays, areas that wouldn't have been given a second thought are being turned into culture farms. One-year-old "poor quality products" are going onto the market in large quantities. This is becoming a huge issue for Mikimoto and other established cultivators. New cultivators have nothing like the capital of Mikimoto-level cultivators. It's a battle of "bourgeois versus proletarian" (*buru tai puro*), but both sides have valid arguments.⁶⁰³

Divisions among cultivators were becoming clear. "Proletarian" cultivators—a group also described by Mikimoto and his allies as "cultivators of little capital"—were problems for cultivators of big capital precisely because smallholders seemed eager to sell as quickly as possible.⁶⁰⁴

⁶⁰¹ After 1933, the Ministry of Agriculture and Forestry mandated that members of the cultivation association make patent licensing agreements directly with a patent holder, not with the association as had been done since 1928. The association could only take a mediating role. In order to do this, in June 1934 the Nishikawa Method Patent Use Group (*Nishikawa-shiki tokkyo jisshidan*) was formed. After mid-1934, Nishikawa Shinkichi entered into agreement not with a single association but with eight representatives of the association, who signed the new patent licensing contract on behalf of the other members. "Senzen ni okeru shinju dantai no hensen," p. 50.

⁶⁰² Auction prices showed consistent year-on-year drops (amid increasingly higher volumes of pearls for sale), from 36.9 yen per *monme* (3.7g) in the 1928-29 auction season down to 1.6 yen per *monme* in 1938-39. Put another way, this meant that 33.3 kg of pearls brought around the same revenue at auction in 1928-29 (328,000 yen) as 844.7 kg of pearls did in 1938-39 (369,000 yen). These statistics should not be read as a comprehensive snapshot of the cultured pearl trade; many of Mikimoto's pearls (and many other cultivators' pearls) moved outside the auction system. Uraki Shin'ichi, *Shinju no keizaiteki kenkyū* (Tokyo: Tokyo daigaku shuppankai, 1970), p. 107.

⁶⁰³ *Tokyo suisan shinbun*, 18 May 1934, MPIMA.

⁶⁰⁴ *Tokyo suisan shinbun*, 18 May 1934, MPIMA.

“Bourgeois” and “proletarian” positions took different shapes among cultured pearl dealers as well. Brokers continued to purchase pearls directly from smallholder cultivators, largely on behalf of foreign exporters based in Kobe. Yet by 1933, Mikimoto’s Paris agent Lucien Pohl was bemoaning the continued influx of “inferior goods” into France. “Since 1921, that is to say over 12 years, my main work has been to educate up the public and all buyers that culture pearls are real pearls,” wrote Pohl. “All my efforts were counterbalanced by the bad policy of Japanese producers, who put big quantities of rubbish or stained pearls on the market.”⁶⁰⁵ Through the formation of cultivator associations and quality control standards, Mikimoto had sought to combat what he saw as a growing problem of cultured pearl overproduction—and, as a result, burgeoning glass-and-fish-scale “imitation pearl” competition. From Paris, Lucien Pohl suggested that any line that may have existed between a cultured and an imitation pearl was blurring: “Culture pearls are often put on the market through low class dealers, and the consequence is that public considers them more and more as imitation pearls; sometimes even, public thinks that imitation pearls are of a higher class than culture pearls.”⁶⁰⁶ Japanese consular attachés in London sent similar warnings.⁶⁰⁷

Difficulties in regulating pearl cultivation in the water extended to difficulties in policing the movement of cultured pearls. One industry insider later estimated that only

⁶⁰⁵ Letter from Ikeda Kakichi, 19 July 1933, MPIMA.

⁶⁰⁶ Letter from Ikeda Kakichi, 19 July 1933, MPIMA.

⁶⁰⁷ Tange Makoto, “Shinju sangyō ni okeru hinshitsu kisei,” *Kikan shinju bijinesu* no. 1 (April 1989).

two-thirds of the association members' pearls went through pre-export inspection.⁶⁰⁸

Mikimoto's program of coordinated pre-export pearl inspections arose with the capture of the two Nishikawa patents that had put him in a position to enroll other cultivators into a producer's association. Public disposals of pearls that did not make the cut had been part of attempts to convince buyers outside Japan that only high quality pearls would be sent abroad. The urgency of controls on production only increased in the aftermath of the Japanese Empire's abandonment of the gold standard.

Indeed, new ranks of cultured pearl buyers worried almost everyone with a stake in the natural pearl trade as well. In Bahrain, two merchants named Abdullah bin Muhammad and Muhammad bin Salih each received prison sentences of seven years under the kingdom's 1930 law that had made the importation of Japanese "cultured" pearls into the kingdom a criminal offense. The judge in their case was the British political advisor to Bahrain, Charles Dalrymple Belgrave. Belgrave was one among a number of British imperial officials who were on the lookout for a "test case" which, if handled properly, might discourage other would-be pearl smugglers of cultured pearls.⁶⁰⁹

Several years after Mikimoto's pearl burning spectacle, some in Mie looked back on it as a futile display.⁶¹⁰ Mikimoto's rapid Gokasho farm expansion and the "bad" pearl destruction in Kobe reflected the company's own conflicting positions toward the

⁶⁰⁸ Tange Makoto, "Shinju sangyō ni okeru hinshitsu kisei."

⁶⁰⁹ *South China Morning Post*, 10 September 1935; *Records of the Persian Gulf Fisheries* vol. 3, 1930-1962 (Cambridge: Cambridge University Press, 1995), 262-264; Charles Belgrave, *Personal Column* (London: Hutchinson, 1960), 41-42, 53.

⁶¹⁰ "Even destruction by fire was for naught" (*shōkyaku shobun mo mizuawa*), as noted in *Ise Shinbun*, 17 January 1937.

embrace of new classes of potential consumers and the restriction of new classes of competing cultivators. In 1933, less than a year after taking over the restructured cultured pearl association, Mikimoto stepped down from its presidency. Leadership passed to Mikimoto's Oxford-educated son Ryūzō, whose energies were by all accounts spent most vigorously on lawn tennis and the collection of Japan's premier library of works pertaining to John Ruskin. He too resigned in 1934. Pearl testing, along with other attempts at quota enforcement, ground to a halt.⁶¹¹

From Cultivator to Buyer

In May 1936, Mikimoto Kōkichi made a momentous announcement. With pearl prices falling in Japan and overseas, Mikimoto said that he would reduce the scale of his pearl cultivation activities by two-thirds. "This is my reorientation from cultivator to buyer," proclaimed Mikimoto. Citing the difficulties posed by over 230 other cultivators who were, as he saw it, throwing "shoddy and recklessly overproduced pearls" (*sosei ranzōhin*) onto the market, Mikimoto decided that he only would buy their "first class pearls" (*ittōhin*) instead.⁶¹²

Mikimoto, in turn, slated most of the company's subsidiary farms for shutdown. The biggest closing of all was in Gokasho Bay, recently home to the largest pearl farm in the world.⁶¹³ The retreat from Gokasho, however, had been brewing in the months before

⁶¹¹ Tange Makoto, "Shinju sangyō ni okeru hinshitsu kisei."

⁶¹² *Ise Shinbun*, 2 May 1936. See overseas coverage in *The China Press*, 13 May 1936; *South China Morning Post*, 19 May 1936; *The Atlanta Constitution*, 25 July 1936.

⁶¹³ *Osaka Mainichi Shinbun* (Mie prefecture edition), 2 May 1936; *Ise Shinbun*, 2 May 1936.

Mikimoto's announcement. In early 1935, Mikimoto fired 73 pearl nucleating technicians under an unprecedented agreement whereby they would start up new farms in Ago Bay and sell their best pearls to Mikimoto. It was the first time since the Gokasho Bay farm's 1908 opening that Mikimoto had allowed his most highly skilled employees to start up farms of their own.⁶¹⁴ By the autumn of 1935, most of the thousand or so remaining employees at the Gokasho farm had lost their jobs as well.⁶¹⁵

Facing the impending expiration of the Nishikawa patents, after which all newcomers would be able to try their hands at cultivation without paying licensing fees, the Pearl King's new business strategy began to resemble what had facilitated the rise of other commodity kings throughout the modern world: buying and branding.⁶¹⁶ As the English-language Hong Kong daily *The China Press* put it, a "culture-king" was becoming a "sales-king."⁶¹⁷ Mikimoto planned to purchase only the best pearls from other cultivators and sell them under the company's *akoyagai* pearl oyster logo, which had been featured in the New York trade journal *The Jewelers' Circular* as a leading example of the value of trademarks.⁶¹⁸ At the same time, Mikimoto had a hand in the creation of new markets that could bypass wholesaler buying in Kobe and Osaka and

⁶¹⁴ The gender of the fired technicians is not clear, but it appears likely that male technicians were targeted for this scheme. *Osaka Asahi*, 18 February 1935.

⁶¹⁵ *Shin'en shinju nanajūnen*, p. 154.

⁶¹⁶ The association had already succeeded in getting a five year extension on the 1916 Nishikawa patents before their scheduled 1931 expiration. *Shin'en shinju nanajūnen*, p. 48.

⁶¹⁷ *The China Press*, 13 May 1936.

⁶¹⁸ *The Jewelers' Circular* v. 106 n. 11 (August 1936), pp. 42-43.

substitute for the Toba auctions where Mikimoto had once sold the pearls from his own farms. With the support of Mie prefecture's governor, Mikimoto announced that a new auction would be held at Kashikojima, at the north end of Ago Bay, in addition to the association's existing auction in Osaka.⁶¹⁹

Contracts to purchase other cultivators' pearls redistributed the risks of 1930s cultivation in a way that seemed to tilt in Mikimoto's favor. But Mikimoto's cultivation rollback also spotlighted the extent to which the export-driven pearl economies of Ago and Gokasho had come to support local livelihoods. The fishing association in Gokasho village responded with alarm to Mikimoto's impending move and the job losses that would accompany it. Village leaders petitioned to Mie prefecture, this time not to have Mikimoto leave the village's waters, as in Tategami, but rather to have him stay.⁶²⁰ Negotiations extended from the end of 1935 through the beginning of 1937, when the two sides reached an agreement whereby Mikimoto would keep a few employees on the payroll in Gokasho even as the farm's shutdown proceeded. Mikimoto's remaining nucleation facilities moved east from Gokasho Bay to Shima's second largest town (after Toba) of Hamajima, where the fishing association had contracted with Mikimoto since the early twentieth century to supply him with living pearl oysters. The new

⁶¹⁹ *Osaka Asahi*, 3 April 1936.

⁶²⁰ Where fishing rights rather than pearl farm jobs were at stake, however, the Tategami model tended to apply. In Ishikawa prefecture's Nakai village, fishers protested against Mikimoto's renewal of the demarcated rights he had received from the prefecture twenty years before. As in Tategami, the village fishing association applied for its own fishing rights in order to invalidate Mikimoto's claims. The mayor explained that "The gathering of pearl oysters near Nakai has resulted in no profits at all for the village. We are now of a mind that we want to get the fishing rights that represent salvation for seventy fishers in southern Nakai." *Hokkoku Shinbun*, 29 September 1936.

headquarters, now called “New Tatoku” (Shin Tatoku), found a home along the western shore of Ago Bay.⁶²¹

The manager of Mikimoto’s Kobe office, a certain Mr. Suzuki, spelled out his employer’s changed approach to cultivation in greater detail during a roundtable discussion with other Mie prefecture representatives of commerce and industry that was serialized in the *Ise shinbun* newspaper. The newspaper’s headline for that day’s conversation was suggestive: “Everything Is Control” (*Subete wa tōsei*). Suzuki offers one point of entry to Mikimoto employees’ emerging understanding of their company’s place amid the changes of the 1920s and early 1930s:

The center of pearl sales is Paris, France. Pearls must pass through Paris. About the time when we first sold cultured pearls, people in the Paris market said that cultivation was unwanted, and tried to interfere with the importation of cultured pearls. A major problem ensued. We struggled to open up sales routes. We said that cultured pearls were cheaper than natural ones but of the same quality. We slowly made progress and sales increased. Eventually natural pearls from the Persian Gulf and India were overthrown. Once this happened other Japanese, as is their flaw, made low quality fakes and exported them in huge quantities. Cultivators also increased and led to a continual decline in their products. Merchants got to the point where if they bought pearls they would suffer a loss, so they stopped making any attempts to buy. Thus we arrived at today’s pitiable situation. Japan and especially Mie prefecture, which accounts for eighty percent of production, have received a huge blow.⁶²²

Suzuki put forth a story of rise and fall: an initial foray into the Paris market; early success and even victory over natural pearl networks; increasing concern over smallholder Japanese cultivators; close attention to overseas importers’ opinions; attempts to organize smallholders; and eventual setbacks based on outsider meddling and insider rule-breaking of myriad sorts. At a basic level, Suzuki articulated the company’s transformed

⁶²¹ Mikimoto *shinju hatsumei 75 shūnen: 1893-1968*.

⁶²² *Ise shinbun*, 17 November 1936.

idea of competition. It did not include direct battles with natural pearl networks. Nor was it simply a question of small-scale versus large-scale cultivators. Rather, competition was a problem conceived in terms of threatening relationships between small-time cultivators and foreign (coded here as Jewish) cultured pearl buyers:

Among the foreigners who deal in pearls there are many of low character. They harass cultivators with hardly any capital. There are many Jews among this type of merchant. They know the problems (of small cultivators) and have a disposition to try to buy as cheaply as possible. The key thing is not to go along with them. Of course, the depression has invited these problems. If those with capital were to buy the products of those without capital I don't think that this would happen.⁶²³

In Mie prefecture, those “with capital” were at the forefront of proposals to reign in the twin specters of foreign competition (ignoring the Japanese brokers who facilitated the trade) and overproduction by hitching themselves more fully to the prospect of state regulation of production within the empire:

I hear that [Mie prefecture] Governor Tomita has begun to investigate controls. I have high hopes that control would be a great thing for our world famous pearl kingdom of Mie Prefecture. In 1930, when I made detailed observations of foreign markets, I heard pleas for control from importers in a number of countries. After I returned to Japan all the cultivators in the country came together to form a control association, but rule breakers appeared and the association could not carry out its functions. Today that association still exists, but in name only. If there were comprehensive controls, today's dire situation would clear up immediately.⁶²⁴

Crucially, even as Mikimoto stepped back from the fray of cultivation, he and his employees continued to support prefectural efforts to regulate it.⁶²⁵ Soon after Mikimoto's turn toward pearl buying, some Mie officials broached the possibility of pursuing policies along the lines of the 1930s regulations on production and sales then being implemented

⁶²³ *Ise shinbun*, 17 November 1936.

⁶²⁴ *Ise shinbun*, 17 November 1936.

⁶²⁵ *Shin'en shinju nanajūnen*, p. 41.

in the African diamond industry, though no concrete proposals appear to have emerged from it.⁶²⁶ In 1939 Mikimoto sent a proposal of own, a “pearl control plan” (*shinju tōsei keikaku*), to the governor.⁶²⁷

Talk of control grew at the national level as well. Established pearl cultivators were at the forefront of efforts to reign in the twin specters of competition and overproduction by hitching themselves more fully to the prospect of state regulation within the empire. Members of the cultured pearl fisheries association discussed the prospect of dissolution at an emergency general meeting in April 1939, but decided instead to petition the Diet to regulate pearl cultivation under the terms of the 1934 Export Fisheries Product Control Law (*Yushutsu suisanbutsu torishimari hō*). The Ministry of Agriculture and Forestry promptly issued an order requiring cultivators to obtain a government license. The association formed the Japanese Pearl Sales Control Company (*Nihon shinju hanbai tōsei kabushiki kaisha*) in order to arrange the distribution of mother oysters, the purchasing of equipment, and the sales of pearls. In the wake of the United States freeze on Japanese assets and subsequent British and Dutch embargoes on exports in July 1941, around 200 cultivators left (or were pressured to leave) their farms. The remaining 106 cultivators formed a cooperative that bought up the mother oysters and equipment owned by the resigning members.⁶²⁸

⁶²⁶ A brief discussion of “British Africa’s diamond control methods” appears in *Ise Shinbun*, 17 January 1937.

⁶²⁷ *Shin’en shinju nanajūnen*, p. 41.

⁶²⁸ *Shin’en shinju nanajūnen*, pp. 53-54.

Conclusion

The story of pearl cultivation in Ago and Gokasho bays from the mid-1920s to the mid-1930s can be, and indeed has been, told as a village story, a Mikimoto story, and a Japanese story. But battles over cultivation in the Japanese empire also shed light on historical interpretations at other scales.

The British political advisor to Bahrain Charles Dalrymple Belgrave reported in 1937 on the changes he had observed during his dozen years in the Persian Gulf. Belgrave had arrived in Bahrain in 1925, at the height of the pearl boom that was bringing together hundreds of boat owners, thousands of indentured divers (many from the coasts of east Africa), and scores of merchants based in Bombay, Paris, and elsewhere in the world.⁶²⁹ Starting in 1925, he charted “five years of prosperity during which the State depended upon the diving industry, two lean years when the pearl market began to droop, two years of crisis during which the revenue did not cover the expenditure, one year of slight recovery followed by a sudden large increase of revenue from oil.”⁶³⁰ A pearl gulf, in short, was looking more and more like an oil gulf. Two developments struck Belgrave as the driving forces behind this change: “general financial depression in Europe, and especially the increasing competition of cultured pearls which were produced in Japan.”⁶³¹

⁶²⁹ Matthew S. Hopper, “The African Presence in Arabia: Slavery, the World Economy, and the African Diaspora in Eastern Arabia, 1840-1940” (PhD diss., UCLA, 2006).

⁶³⁰ “General Review, December 1937,” in *Bahrain Government Annual Reports, Volume II: Reports on Pearl Industry from 1937 to 1942* (Cambridge Archive Editions, 1987), p. 8.

⁶³¹ “General Review, December 1937,” p. 7.

In the 1930s Persian Gulf, the story of the natural pearl began to be narrated, as it is still overwhelmingly narrated to this day, as a story of decline spurred by the 1929 depression (not by the 1921 European “faked pearl sensation”) and sealed by competition from a united foe, the Japanese cultured pearl. Yet as we have seen in this chapter, Mikimoto had always seen more than one kind of Japanese cultured pearl. He created at least two ways of dividing pearls: first, between exportable “good” pearls and burnable “bad” ones, and second, between Mikimoto pearls and everything else. Distinctions between natural and cultured pearls were secondary concerns in Ago and Gokasho bays.

In Ago Bay, too few late nineteenth century pearl oysters became too many 1930s pearls. Meiji-era fisheries boosters had seen Mikimoto’s attempts at shellfish raising as the solution to a problem of “reckless overharvesting” that was both cause and consequence of skyrocketing prices for pearls. Global depression brought with it a different situation: the “reckless overproduction” of pearls in Ago Bay, a brief window of extraordinarily “Mikimotoed” waters in Gokasho Bay, and a wider range of routes by which pearls could move overseas from Kobe. Sorting good pearls from bad was a cornerstone of Mikimoto’s efforts to sort competing cultivators, competing pearl buyers, and the products that changed hands between them.

Mikimoto’s opportunity to police distinctions between good and bad Japanese pearls, and his primary identity as a cultivator, expired with the patents he had used first to exclude competitors and later to bind them together. The diagnosis of reckless overproduction was likewise blamed for, and exacerbated by, falling prices for natural and cultured pearls alike. Even so, cultured pearls—and especially Mikimoto pearls—took

more prominent places in the United States in the years before the Japanese attack on Hawaii's Pearl Harbor. It is to interwar Manhattan we next turn.

Chapter 5 Draft

The American Handshake: Representing Cultivation on Fifth Avenue and Pearl Island

In October 1926, Mikimoto Kōkichi left Yokohama for his first trip to the United States. Upon arriving in California he addressed reporters from San Francisco's Japanese-language newspaper community, including the *Shin Sekai* (*The New World*). "I have pearl culture farms across Japan and in the South Seas island of Palau," said Mikimoto. "I have opened shops in Paris and London. I have come to operate as the world's Pearl King. Pearls are next to raw silk as one of Japan's important exports. Japan accounts for one-eighth of world pearl production. Eighty percent of Japan's share comes from me."⁶³² Mikimoto exuded success unbounded by geographic constraints, yet the statistics he cited glossed over other changes that were occurring around him. "One-eighth of world pearl production" implied that cultured pearls and natural ones were bought and sold interchangeably; "eighty percent of Japan's share" suggested Mikimoto's overwhelming domestic dominance. Yet during the 1920s, two concurrent developments—French and British pearl wholesaler resistance to Japanese cultured pearls and the nascent anti-Mikimoto cultivator movement in western Japan—were redrawing the boundaries of

⁶³² *Shin Sekai*, 2 November 1926, MPIMA.

Mikimoto's business. Both pushed Mikimoto and his employees closer to the United States of America. "Once I turn seventy, I plan to make the United States the center of my battles for the next ten years," the sixty-eight-year-old Mikimoto told the *Shin Sekai*.⁶³³ From the mid-1920s until 1941, when Japanese aircraft bombed the United States Pacific Fleet stationed in Hawaii's Pearl Harbor, Mikimoto indeed looked to Americans as his most important audience. A result of this was that Mikimoto became one of the most visible exponents of Japanese interests in 1930s America, even though his company's position was not coterminous with Japanese exporters *in toto*, with other cultivators and buyers of "Japanese" pearls, or, to be sure, with Japanese proponents of autarkic self-sufficiency and sumptuary restraint.

At a 1926 send-off party for his impending American journey, Mikimoto received a letter of introduction from the entrepreneur Shibusawa Eiichi (1840-1931), which he subsequently used to arrange a visit in New Jersey with an even better-known inventor figure, Thomas Edison. In San Francisco, Mikimoto made reference to Shibusawa's vocabulary of commercial relations, vowing to the *Shin Sekai* to "take on the mantle of private diplomacy (*minkan gaikō*) in order to do everything in my power for handshakes between Japan and the United States."⁶³⁴ Mikimoto's appeal to the private diplomacy of *minkan gaikō* positioned his company not just as a storefront or a firm, but as a permanent commercial representative of Japan in the United States. The term *minkan gaikō* itself gained currency in Japan in the aftermath of the "Gentleman's Agreement" of

⁶³³ *Shin Sekai*, 2 November 1926.

⁶³⁴ *Shin Sekai*, 2 November 1926.

1907-1908, in which the Japanese government accepted informal restrictions on Japanese migration to America. It reflected moves by Shibusawa Eiichi and other Japanese elites to encourage the exchange of certain kinds of Japanese things—facilitated, in historian Mitziko Sawada’s phrasing, by Japanese “gentlemen” rather than Japanese “culprits”—in a post-Gentleman’s Agreement United States.⁶³⁵ The term suggested a style of foreign relations (*gaikō*) that, as with the idea of a Gentleman’s Agreement itself, was outside formal bureaucratic channels of state-to-state diplomacy.⁶³⁶ Its space was the *minkan*, an unofficial sphere of “private” actors who portrayed themselves as operating in an elite culture of sociability outside the realms of imperial politics and racial divisions. Nonetheless, they identified themselves and their interlocutors in a language of nation, national interests, and nationality.⁶³⁷ Moreover, the private diplomacy of *minkan gaikō* went hand in hand with public performances that intersected obliquely or directly with

⁶³⁵ Mitziko Sawada, “Culprits and Gentlemen: Meiji Japan’s Restrictions of Emigrants to the United States, 1891-1909,” *Pacific Historical Review* v. 6 n. 3 (August 1991), pp. 339-359. For a laudatory account of Shibusawa’s earlier attempts to forge business alliances in the United States, see Kimura Masato, *Shibusawa Eiichi: Minkan keizai gaikō no sōshisha* (Tokyo: Chūkō shinsho, 1991).

⁶³⁶ Mikimoto and Shibusawa’s invocations of *minkan gaikō* share certain overlaps with later scholars’ analytical categories, such as historian Akira Iriye’s notion of “cultural internationalism.” My reading of the published and archival materials used in this chapter does not allow me to separate “cultural” factors from political and economic questions of power and access, as Iriye has done. Where I do agree with Iriye’s valuable monograph is his argument that the notion of “culture” itself has had a changing and contested history. Ideas of race, culture, and civilization were all part of late nineteenth and early twentieth century Japanese justifications of equality with the West which, it was hoped, might allow for the construction of an inter-imperial culture of sociability even as it produced racialized hierarchies within empires. Akira Iriye, *Cultural Internationalism and World Order* (Baltimore: Johns Hopkins, 1997).

⁶³⁷ The seminal analysis of the development of opposing private and public categories of *min* 民 and *kan* 官 (different from the *minkan* 民間 discussed above), a distinction that itself justified claims of imperial rule, can be found in Carol Gluck, *Japan’s Modern Myths* (Princeton University Press, 1985).

state concerns. It existed alongside the power of vernacular media to disseminate narratives in multiple places and in multiple languages.⁶³⁸

Mikimoto's attempt to produce a new image and a new market for his products placed him and his employees in a unique position to engage with Americans. He arrived in the United States with visions of *minkan gaikō*, but he did so just as fears of Japanese immigration and rising worries over low-price Japanese imports were being undergirded by formal legal restrictions on the movement of people and things. One crystallization of these tensions was the 1924 passage of the Immigration Exclusion Act, a piece of legislation that tightened controls over incoming Japanese people. Another was the implementation of punitive tariffs on certain kinds of made-in-Japan objects. In America, however, cultured pearls were not treated in the same way that many other Japanese imports came to be in the 1930s. United States customs law did not, in fact, even classify the products of cultivation as "industrial" goods or "manufactures." They were rather, like other "natural" pearls taken from living shellfish, grouped together as "raw materials" without regard to their geographical provenance.

As such, Mikimoto's employees in New York attempted to deal with other Fifth Avenue pearl retailers in a national market where the United States government made no legal distinction between natural and cultured pearls. What they discovered was that the impetus for pearl protectionism was not located solely or even primarily at the scale of the nation-state. As we have seen in the previous two chapters, multiple visions of market

⁶³⁸ Alternatively, the contemporaneous (and in practice largely interchangeable) of *kokumin gaikō* 国民外交 refers to diplomacy among citizens of different states.

purity existed simultaneously in the early twentieth century's pearl empires. On one hand, decades before public outcry over "blood diamonds" led to the Kimberley process and other schemes for documenting a stone's provenance in the 1990s, European pearl wholesalers created techniques for identifying "natural" pearls and singling out "Japanese cultured" pearls in the places where their own pearls were gathered, bought, and sold.⁶³⁹ On the other, friction over what constituted a Japanese cultured pearl led to Mikimoto's efforts to label some pearls "bad" and destroy them even before they left Japanese ports.

Mikimoto's employees found that machine-mediated pearl testing and other technologies for separating nature from culture spread to New York merchants with links to the same Paris and London wholesalers who sought to regulate the labeling of pearls from Japan. Local dreams of separation and purity existed alongside the formation of convergent supply chains that were as far flung as Paris and Kobe and as close as a few blocks of Manhattan. These convergences shaped parallel efforts to sell pearls. Americans heard a wide range of stories about the material and personal linkages that brought natural and cultured pearls to glass display cases and to their front doors. Creating a captive audience for those stories became a pressing concern for Mikimoto and for many others. In the United States and Japan, Mikimoto tried to demonstrate that his company was both unconnected to Japanese aggression on the Asian mainland and invested in a liberal world order of inter-imperial trade. One way he attempted this was by constructing exclusive spaces of commerce and display. Through 1941, Mikimoto pursued

⁶³⁹ See, for example, Franziska Bieri, *From Blood Diamonds to the Kimberley Process: How NGOs Cleaned Up the Global Diamond Industry* (Ashgate Publishing, 2013).

wholesale and retail sales throughout the company's network of shops, offered tours of his Toba "Pearl Island" theme park, and put on exhibitions around the United States.

Financial crisis and political crisis were not neatly separable for Mikimoto and his competitors. Wall Street's 1929 stock market crash, and the unhitching of British and Japanese currencies from a basis in gold, reshaped evaluations of different kinds of pearls. "Oriental" pearls lost their place as objects of speculation, a position they had held even after wholesalers began to reclassify them as "natural" pearls following the initial uproar over "Japanese cultured" pearls in 1921. In response, Fifth Avenue natural pearl wholesalers mounted an unprecedented campaign to bring their products back into favor. But waiting in New York, and elsewhere in the world, were Mikimoto's employees. So too were American purveyors of pearls who bought from the ranks of non-Mikimoto cultivators in Kobe. In different ways, both sought to reach a middle class of female consumer who might purchase a middle class of pearl.

Mikimoto's project of discerning, responding to, and shaping American tastes took a new tenor following the September 1931 Japanese military attack that came to be known as the Manchurian Incident. What we find are Mikimoto's selective efforts to separate his pearls spatially and rhetorically from the militaristic trappings of the wartime Japanese empire. All the while, Mikimoto's overseas employees watched for signs of anti-Japanese sentiment in the United States amid the intensification of war in China. But on Fifth Avenue and in Toba, the company's exhibitions were ongoing. Public strategies of private diplomacy appeared from, and were sustained by, schemes to sell Mikimoto pearls and a Mikimoto method of saltwater cultivation.

The Pearl King's Emissaries

Mikimoto's turn to America arose from the contingencies of the 1920s, yet it also followed from several decades of efforts to sell pearls inside and outside the Japanese empire. Some of our earliest records of Mikimoto's cultured pearl sales activities come from the diary of one particularly well-to-do Japanese woman, Hozumi Utako. Starting in October 1899, Mikimoto began to bring his pearls in person to Utako at the Tokyo residence she shared with her husband, Meiji Japan's foremost legal thinker Hozumi Nobushige. Utako recorded fifteen of Mikimoto's house calls through 1906, the end of her published diaries. Mikimoto brought Utako something different each time: sometimes a variety of loose pearls, other times an unusual piece of jewelry. Utako made special requests, such as the time she asked for nine large cultured pearls. She got a glimpse of her jeweler's budding overseas ambitions when Mikimoto once showed her a box of three hundred pearls that he was planning to send to Italy.⁶⁴⁰

Mikimoto made special efforts to court the favor of Utako and her circle of acquaintances—including, in all likelihood, her father Shibusawa Eiichi. But as his farming infrastructure grew in the early twentieth century, Mikimoto delegated the tasks of selling, explaining, and defending pearls to other men in his employ. Some were part of Mikimoto's circle of friends and family who lived to the south of Ise Shrine. Others were

⁶⁴⁰ *Hozumi Utako Nikki* (Tokyo: Misuzu shobō, 1990), pp. 495-496, 534, 548, 552, 584, 599, 606, 616, 670, 686, 833, 841, 946-947.

hired from commercial schools in Japan's major cities. Still others worked as local commission agents outside the empire. Mikimoto was alone among other pearl cultivators in consistently sending salesmen (until the 1930s they were a male tribe) abroad to sell pearls directly at exhibitions and, increasingly, from overseas Mikimoto shops. The company's spheres of activity gradually expanded from the company's main store in Tokyo's Ginza district to branch offices and shops in London, Shanghai, Paris, New York, Bombay, Chicago, Los Angeles, and San Francisco. Together, the company's emissaries gained local windows onto the desires and concerns of overseas wholesale buyers and retail customers.

In March 1899, just a few months after harvesting his first crop of semi-spherical "culture pearls," Mikimoto opened a retail shop on a side street near Tokyo's Ginza commercial district. Mikimoto's younger brother Saitō Shinkichi headed the shop, where he sold pearls and other jewelry items along with Mikimoto's brother-in-law Kume Takeo.⁶⁴¹ Mikimoto sent Saitō, Kume, and a sizable number of culture pearls to the United States for the 1904 St. Louis Louisiana Purchase Exposition. Since his early years as a late-nineteenth century dealer in China-bound marine products like sea cucumber and abalone, Mikimoto had taken an interest in exhibitions in Mie prefecture and elsewhere in Japan. He was no stranger to foreign ones either, having sent "natural" pearls to the 1893 Chicago World Columbian Exposition and "culture pearls" to the 1900 Paris Exposition Universelle, among others.⁶⁴² But in a departure from his past focus on on-site

⁶⁴¹ *Mikimoto shinju hatsumei 75 shūnen: 1893-1968* (Mikimoto shinju kaisha, 1968).

⁶⁴² *Mikimoto shinju hatsumei 75 shūnen*.

exhibition and sales, Mikimoto used the 1904 Louisiana Purchase Exposition as an extended opportunity to have his employees observe how people in America bought and sold pearls. With seventeen-year-old Kume in tow, the twenty-seven-year-old Saitō spent several months in the United States. After leaving St. Louis they focused on New York City. Saitō negotiated sales agreements with New York importers, but above all, he focused on gathering information related to the city's bustling pearl and precious stone trade.⁶⁴³

Saitō and Kume's New York sojourn changed the way Mikimoto's young company sold pearls in Japan. Soon after the pair's return from America Saitō decided, "based upon my experience observing conditions abroad," to move the shop from a side street to a more prominent position on Ginza's main shopping thoroughfare.⁶⁴⁴ The Fifth Avenue headquarters of Tiffany & Co. provided Saitō with a model for creating an air of exclusivity in Tokyo. In the half century since its founding in 1837 as a purveyor of stationery, silverware, and other "fancy goods," Tiffany & Co. had become a place where the most expensive pearls and precious stones in the United States changed hands. Much of the growth in this trade had taken place since the late 1800s boom in South African diamond supplies and the parallel spike in "oriental" pearl prices, when the company had engaged the services of a man named George Frederick Kunz (1856-1932). By the turn of the century, Kunz was the United States' best-known gem expert, one of a broader group of scientifically trained consultants who gained prominent public roles in America during

⁶⁴³ *Mikimoto shinju hatsumei 75 shūnen.*

⁶⁴⁴ "Zaikyō kenjin hōmon roku," *Ise Shinbun*, 28 April 1908.

the nineteenth century. Upon his return to Japan, Saitō cited Kunz as the inspiration for the store's new all-male salesforce. Saitō reckoned that sales women might be appropriate "if this were a department store like Mitsukoshi," but protested that "a jewelry shop is something else altogether." He recalled Kunz's reputation as an evaluator of pearls and precious stones, which, he thought, allowed customers to make worry-free purchases. By contrast, he felt that female employees were "too casual" and failed to "push sales enough."⁶⁴⁵ As at Tiffany's (and at Tokyo's turn-of-the-twentieth-century Japanese department stores like Mitsukoshi), the Ginza shop adopted fixed prices in order to avoid haggling. Instead, salesmen directed customers' attention toward the methods by which culture pearls had been produced in the water. Saitō created a sitting room in the store's second floor, complete with pearl oyster shells and a display outlining the company's method of marine pearl cultivation.⁶⁴⁶

Selling culture pearls in early twentieth century Tokyo was an exercise in introducing a primarily foreign clientèle to a product, a male sales staff, and techniques of display that were consciously patterned after practices current in what Mikimoto's employees saw to be the world's three fashion centers: Paris, London, and New York. The Ginza shop placed advertisements in newspapers and magazines in San Francisco and Shanghai. Employees sent calling cards to (American and European) foreigners who stayed at Tokyo's hotels, inviting them to visit the store. When visitors came, salesmen tried to keep them engaged for as long as possible. Stoves crackled in the winter; electric

⁶⁴⁵ "Zaikyō kenjin hōmon roku," *Ise Shinbun*, 30 April 1908.

⁶⁴⁶ "Zaikyō kenjin hōmon roku," *Ise Shinbun*, 30 April 1908.

fans buzzed in the summer. As Saitō explained it to readers of the Mie prefecture daily *Ise Shinbun*, the Ginza shop's main purpose was to "take in money from abroad."⁶⁴⁷ "When it comes to foreigners," Saitō counseled, "the most important thing is to ensure that your hands can scratch their every itch."⁶⁴⁸

Where did foreigners itch? In the first two decades of the twentieth century, Mikimoto paid Kobayashi Rikiya as much as eight thousand yen per year, more than any of his other employees, to answer this very question. Kobayashi studied French in Tokyo and spent time abroad before Mikimoto hired him and sent him to Europe's largest precious stone entrepôts. He based himself in London and Paris for much of the period between 1908 and 1915. There he studied European jewelry fashions by collecting samples and gathering print materials.⁶⁴⁹ Transportation links were vital in keeping the wheels of pearl fashion turning. "It used to take around fifty days to get the latest magazines from Paris, London, and New York," said Saitō, "but with the opening of the Siberian railway it now takes less than thirty."⁶⁵⁰

Before long, however, Mikimoto began to seek more direct connections to overseas consumers. London was the first place where Mikimoto actively tried to expand his sales infrastructure. Kobayashi and Mikimoto's first two salesmen, Saitō and Kume, gathered together in London for the 1910 Anglo-Japanese exposition. Kobayashi stayed on

⁶⁴⁷ "Zaikyō kenjin hōmon roku," 30 April 1908.

⁶⁴⁸ "Zaikyō kenjin hōmon roku," 30 April 1908.

⁶⁴⁹ *Mikimoto shinju 100 nenshi* (Tokyo: Kabushikigaisha Mikimoto, 1994), p. 77.

⁶⁵⁰ "Zaikyō kenjin hōmon roku," *Ise Shinbun*, 4 May 1908.

afterwards in order to plan out a strategy for opening an overseas base. A key issue was one of merchant agency versus direct management: would it be better to make a deal to consign pearls through established dealer channels or establish a branch abroad?

Mikimoto chose a compromise path, stationing employees alongside agents in London. In 1911, long-serving Mikimoto employee Katō Toranosuke and London-based dealer Samuel Jones opened the company's first overseas branch office in the Hatton Garden Diamond House.⁶⁵¹

The company's Japanese sales staff expanded throughout the 1910s. Mikimoto developed a close relationship with the *Ōkura shōgyō gakkō*, a commercial school founded by the leader of the Ōkura trading company, the very firm through which Mikimoto had made his first attempt to consign pearls to London in 1898.⁶⁵² Longtime employees Kume Takeo, Wada Shintarō, and Suzuki Riichi all studied accounting and foreign languages at Ōkura school before joining the company.⁶⁵³ Advertisements in major Japanese newspapers announced the international comings and goings of Mikimoto's salesmen. In the absence of crisis, however, Mikimoto did not closely oversee his emissaries' activities. Saitō claimed to enjoy a free hand in day-to-day management of the Ginza shop, formally reporting to Mikimoto once a year on Christmas day.⁶⁵⁴

⁶⁵¹ *Mikimoto shinju 100 nenshi*, p. 77.

⁶⁵² *Mikimoto shinju 100 nenshi*, p. 77.

⁶⁵³ Katō Toranosuke mentioned this in his preface to Kanbe Kōkichi, *Shanghai Mikimoto shinjuten no kaiko* (Mikimoto Kōkichi shiryōhensan iinkai, 1961), held in MPIMA.

⁶⁵⁴ "Zaikyō kenjin hōmon roku," 28 April 1908.

Overseas salesmen kept in contact with the company's farming and sales headquarters by letter, but Mikimoto generally waited until after they had returned to Japan for a longer debriefing at his Toba estate in Mie prefecture.⁶⁵⁵

Mikimoto scaled back his European activities during the First World War. He briefly turned his focus instead to Chinese ports, which had once served as the destination for the bulk of his nineteenth century trade in processed marine products. In the early twentieth century China was one of the world's largest markets for smaller pearls, known in Japan as *keshidama*, which could be used as *materia medica* or in face creams, rather than as objects of adornment. There Mikimoto attempted to sell his cultured wares. In 1914 Mikimoto sent his younger brother Saitō to Shanghai, where a Mikimoto shop opened on the city's Nanjing Road shopping thoroughfare under the management of employee Kanbe Kōkichi.⁶⁵⁶

Much of the Shanghai shop's jewelry came from Tokyo, where Saitō Shinkichi was, by the end of the First World War, running the jewelry factory that Mikimoto had acquired in the early twentieth century. Saitō instituted Japan's first workingman's church and ran a night school for employees, providing training while working to avoid workplace labor disputes with the factory's all-male workforce.⁶⁵⁷ The Ministry of

⁶⁵⁵ Ototake Ai, *Chichi, Mikimoto Kōkichi o kataru* (Mikimoto, 1993), p. 202.

⁶⁵⁶ Kanbe Kōkichi, *Shanghai Mikimoto shinjuten no kaiko*.

⁶⁵⁷ A 1923 Tokyo prefectural government survey listed 81 male employees at the factory. *Shokkō no fukuri zōshin shisetsu gaiyō* (Tokyo: Tokyofu, 1924), pp. 100-102. For an overview of the factory school's curriculum, see *Kaisha kōjō nado ni okeru jitsugyō fukushū kyōiku shisetsu no jōkyō* (Tokyo: Monbushō jitsugyō gakumukyoku, 1919), pp. 19-21. A summary of the factory's leisure activities can be found in *Nōritsu zōdai kagakuteki shimatsuhō hōkokusho, dai 5 satsu* (1923), pp. 6-8.

Agriculture and Commerce had named the jewelry factory a model factory (*mohan kōjō*) in 1922.⁶⁵⁸ The “model factory” was a formal designation that appeared amid Japan’s World War I manufacturing boom, but it was a label which also bore some relation to the Tatoku Island farm’s earlier accolades as a “model” space of marine cultivation. It was around this time, moreover, when Mikimoto was named purveyor to the imperial household for the January 1923 wedding of the crown prince, the soon-to-be Emperor Hirohito.⁶⁵⁹ The factory’s employees attired the crown princess in a manner befitting her title, by constructing a pearl-studded tiara along the lines of headwear that accompanied weddings and coronations elsewhere in Europe.⁶⁶⁰

Mikimoto instructed his employees to emphasize what he called the “Mikimoto style” (*Mikimoto-ryū*).⁶⁶¹ That Mikimoto was conscious of his company’s image should not in itself come as a surprise. He was one of a larger cohort of late-nineteenth century Japanese businessmen who took advantage of print advertising, branding, and exhibitions—all techniques of display with antecedents in Tokugawa Japan’s commercial world.⁶⁶² By the 1910s, Mikimoto had joined a far smaller group of design-oriented

⁶⁵⁸ *Teikoku hatsumeikaden jōkan* [v. 1] (1930), p. 91.

⁶⁵⁹ Ototake Iwazō, *Denki Mikimoto Kōkichi* (Tokyo: Kōdansha, 1950), p. 415.

⁶⁶⁰ Takashi Fujitani, *Splendid Monarchy: Power and Pageantry in Modern Japan* (Berkeley: University of California Press, 1996); Sally A. Hastings “The Empress’ New Clothes and Japanese Women, 1868-1912,” *The Historian* v. 55 n. 2 (June 1993), pp. 677-692.

⁶⁶¹ “Zaikyō kenjin hōmon roku,” *Ise Shinbun*, 28 April 1908.

⁶⁶² Peter Kornicki, “Public Display and Changing Values: Early Meiji Exhibitions and their Precursors,” *Monumenta Nipponica* v. 49 n. 2 (Summer 1994), pp. 167-196; Gennifer Weisenfeld, “From Baby’s First Bath’: Kaō Soap and Modern Japanese Commercial Design,” *The Art Bulletin* (September 2004), pp. 573-598.

entrepreneurs who purported to sell the products of their factories (and saltwater farms) directly in Europe, without relying solely on agents, foreign export buyers, or Japanese general trading companies.⁶⁶³

Saitō described the Ginza store's jewelry designs and glass display cases as "all American-style, pure and simple."⁶⁶⁴ But as soon as Mikimoto's employees began to attend overseas exhibitions in the West coast of the United States, the contradictions of living overseas as Japanese gentlemen became apparent. When Katō Toranosuke looked back on widespread American interest in pearl cultivation methods at Seattle's 1909 Alaska-Yukon Pacific Exposition, he also recalled the Oregon restaurant where he had been refused service.⁶⁶⁵ Kume Takeo subsequently caused a minor international incident when he was arrested in California on charges of shirking customs payments on items of pearl jewelry he had brought for sale at the 1915 San Francisco and San Diego expositions.⁶⁶⁶

With expansion and long-term overseas residence also came new problems of comparison in the places where Mikimoto's employees sold pearls in close proximity to other dealers of both natural and cultured pearls. Shops in London, Shanghai, and Paris,

⁶⁶³ Mikimoto's closest global sales analogue in the early twentieth century was perhaps the Aichi-based Morimura Ichizaeomon (1839-1919) and his Noritake porcelain factory. One Japanese advertising monograph is organized around this corporate pairing. See Fujii Nobuyuki, *Sekai ni hiyaku shita burando senryaku* (Tokyo: Fuyō Shobō Shuppan, 2009).

⁶⁶⁴ "Zaikyō kenjin hōmon roku," *Ise Shinbun*, 1 May 1908.

⁶⁶⁵ Katō Toranosuke, *Mikimoto shujin to watashi to no kankei* (Mikimoto Kōkichi shiryō hensan iinkai, 1968), held in MPIMA.

⁶⁶⁶ "Japanese Pearl Exhibitor Arrested," *San Francisco Chronicle*, 16 October 1915.

moreover brought Mikimoto's salesmen into close contact with other pearl merchants. Mikimoto had long attempted to ingratiate himself with local trading powers. In 1916, Mikimoto traveled to Shanghai to host a reception for over one hundred Chinese pearl dealers.⁶⁶⁷ Things did not work out entirely as planned. Kanbe later reminisced of the company's first-generation semi-spherical culture pearls that Chinese buyers "still did not fully accept their value" and, as such, the shop sold items of pearl jewelry primarily to European and American customers.⁶⁶⁸ The Shanghai shop closed after the First World War (though it would later reopen during the second Sino-Japanese War). Paris and London became wholesaling conduits for the spherical pearls that started to come from the Gokasho farm in larger quantities after 1919. But wherever Mikimoto's round pearls went in Europe, dispute followed. As a result, Mikimoto and his emissaries began to look once more to the United States.

Seo Juzō's Fifth Avenue

A few months prior to his 1926 trip, Mikimoto sent employees Katō Toranosuke and Yokohama Reikichi ahead of him to America.⁶⁶⁹ Both undertook an advance mission to set up a display featuring a five story, pearl encrusted pagoda for the Philadelphia World's Fair. As Katō later wrote, in Philadelphia he observed none of the overt hostility the company had at times faced in Europe (or, for that matter, on the West coast of the

⁶⁶⁷ *Mie shinbun*, 26 November 1916.

⁶⁶⁸ Kanbe Kōkichi, *Shanghai Mikimoto shinjuten no kaiko*.

⁶⁶⁹ *Yomiuri Shinbun*, 28 March 1926.

United States): “We had prepared for something more like the resistance we experienced in London.”⁶⁷⁰ Selling pearls year-round in the United States fell under the purview of Seo Juzō, who had worked in London amidst the post-1921 Japanese pearl “sensation.” In 1927, as Mikimoto continued onward to Europe with Katō, Seo assumed the position he would hold for over a decade as manager of the Mikimoto shop on New York City’s Fifth Avenue.

Seo Juzō came to Fifth Avenue while French court battles raged over the products of pearl cultivation. As we saw in Chapter 3, rulings in Paris established legal requirements for the labeling of “cultured” pearls. By the following decade, members of Europe’s largest international jewelers’ association, a group known by its French acronym B.I.B.O.A., had adopted commercial pearl definitions according to the presence or absence of “human agency” in the formation of pearls in a living shellfish—even where national governments did not acknowledge legal distinctions between nature and culture.⁶⁷¹ Anti-cultivation pearl wholesalers and retailers sponsored the development of testing instruments, the formation of testing laboratories, and the issuance of certificates of authenticity. Documentary records of provenance and production, and instruments to establish or confirm a pearl’s identity, were part of efforts to enforce distinctions between natural and cultured pearls.

New York was far and away the most valuable market for the pearls that passed through Paris in the 1920s. The dependence of French intermediaries on rising pearl

⁶⁷⁰ Katō Toranosuke, *Mikimoto shujin to watashi to no kankei*.

⁶⁷¹ B.I.B.O.A., *International Nomenclature of Admissible Trade Names* (The Hague: B.I.B.O.A., 1936).

prices in general, and American demand in particular, was reflected in the title of the French trade journal *La Perle*, the successor to its earlier twentieth century incarnation, *Le Diamant*. French and American purveyors of pearls forged links that brought pearls to a growing ranks of monied speculators in the United States. In 1917, amid the wartime slowdown in transatlantic trade, Jacques Cartier traded his best double strand of pearls in return for the property that would become his company's Fifth Avenue flagship store.⁶⁷² American-owned emporia like Tiffany & Co. and French-owned counterparts like Cartier shared space along New York's Fifth Avenue. There many of the city's most highly priced "oriental" pearls could be found.

Yet the United States remained an equal legal playing field for natural and cultured pearls throughout the early twentieth century. Cultured pearls were a peculiar exception to 1920s American trends of formalized legal restrictions on Japanese immigration and rises in punitive value-added taxes on imported Japanese manufactures.⁶⁷³ Since the late nineteenth century, customs officials in the United States had considered all pearls that formed inside living shellfish as "raw materials" for tariff purposes.⁶⁷⁴ This interpretation remained in effect during the 1920s and 1930s. Even as

⁶⁷² Hans Nadelhoffer, *Cartier: Jewelers Extraordinary* (New York: Harry N. Abrams, 1984), p. 131.

⁶⁷³ See, for example, Edward S. Miller, *Bankrupting the Enemy: The U.S. Financial Siege of Japan Before Pearl Harbor* (Naval Institute Press, 2007).

⁶⁷⁴ Tariffs became an issue for hemispherical pearls in 1904, not long after Saitō and Kume had arrived in the United States. Courts in America eventually ruled that hemispherical pearls could be imported under a lower tariff as "natural" pearls, not as "manufactured" items. In contrast to subsequent controversies that would arise over spherical cultured pearls, the issue of distinguishing hemispherical pearls from spherical ones was dismissed as a problem by American customs officials: "These Japanese pearls, although of excellent quality, are easily distinguished by an examination of their base, and are of much less value than

the sweeping 1930 tariff legislation known informally as the Smoot-Hawley Act imposed sixty percent *ad valorem* tariffs on glass pearls manufactured in Osaka, it halved the tariff on pearls from living shellfish to ten percent.⁶⁷⁵

Further dampening possible criticism of Japanese pearl competition was the decline of an American freshwater pearl industry that had once boomed along the Missouri River and its tributaries during the resurgence of global pearl demand in the late nineteenth century, a time during which Tiffany & Co. under George F. Kunz had briefly emerged as a major buyer.⁶⁷⁶ In the 1920s and 1930s, however, there were fewer substantial domestic freshwater pearl gathering interests to appease. And as Japanese shell buyers in Tianjin and elsewhere in mainland China folded, Mikimoto and other cultivators also began to buy freshwater shells gathered in the American Midwest, a forerunner of a trade that would increase dramatically after the post-World War II Occupation of Japan.⁶⁷⁷ Saltwater pearl cultivation in Japan thus did not compete with

those produced entirely by natural means.” See *Treasury Decisions Under the Customs, Internal Revenue, Industrial Alcohol, Narcotic and Other Laws*, v. 8 (U.S. Government Printing Office, 1905), p. 13.

⁶⁷⁵ United States Tariff Commission, *Post-war Imports and Domestic Production of Major Commodities* (Washington, D.C.: Government Printing Office, 1945), pp. 1199-1202. Like raw silk, uncut diamonds and other stones could be imported to American processors duty-free.

⁶⁷⁶ In 1890, Kunz wrote of an 1878 “pearl excitement” near Waynesville, Ohio and a similar 1889 event in Wisconsin. During the latter freshwater pearl gathering boom, “more than \$10,000 worth” had arrived in New York over a period of three months. Before Kunz’s time with the company, Charles L. Tiffany acquired a 93 grain pearl found near Paterson, New Jersey, which he later sold to Empress Eugenie of France for \$2,500. Kunz noted, however, that “it is to-day worth four times that amount.” George F. Kunz, *Gems and precious stones of North America* (New York: The Scientific Publishing Company, 1890), pp. 229-230.

⁶⁷⁷ See, for example, a report of the Ehime prefectural fisheries experiment station that mentions *karasugai* from China and the United States or *chōgai* from Australia as suitable shellfish varieties for nuclei. *Ehime ken suisan shikenjo gyōmu hōkoku Taishō 2* [1913] (1923), p. 56.

freshwater shellfish gathering in the United States; rather, it relied on American shell. It was not in customs offices but rather along New York's Fifth Avenue where conflicts over cultured pearls reached their highest pitch. In spite of established pearl dealers' warnings, prices for pearl necklaces, "oriental" and "Mikimoto" alike, did not falter after Seo Juzō came to Fifth Avenue. Total levels of American pearl imports remained near record highs throughout the 1920s.

But Seo quickly found that attempts to divide natural from cultured pearls had spread across the Atlantic as well. "First class (*ichiryū*) Fifth Avenue shops will not buy cultured pearls at all," wrote Seo to the Ginza shop several months after his arrival in Manhattan. "Even when they buy natural pearls, they require a certificate (*hoshōsho*) guaranteeing that they are not cultured pearls."⁶⁷⁸ Among the Fifth Avenue shops that did not wish to deal in cultured pearls was Tiffany & Co. While Seo Juzō established his first local sales contacts down the street, Tiffany's employees oversaw the arrival of several Perrin-Chilowsky pearl endoscopes.⁶⁷⁹ These instruments formed the core of the first pearl testing laboratory in the Americas.

Seo Juzō's Fifth Avenue turned out to be something different from Cartier or Tiffany & Co.'s Fifth Avenue. The unshared meaning of "first class" became a problem for

⁶⁷⁸ Seo Juzō to Mikimoto Kōkichi, 12 October 1927, held in MPIMA.

⁶⁷⁹ "It was reported that one of the last consignment of Endoscopes which had been allocated to Messrs. Mappin & Webb Ltd., had, with the consent of this firm, been transferred to Messrs. Tiffany & Co., also that M. Seldmann had advised on June 28th that a further consignment of eight machines was being despatched by the week ending July 2nd, but so far, these had not reached this country." 13 July 1927, Diamond, Pearl, and Precious Stone Trade Section Minute Book 1921-1927, CLC/B/150/MS16600/001, LMA.

Mikimoto and his employees precisely because it struck at the heart of the claims of quality and exclusivity, based on Kunz's earlier example at Tiffany & Co., that Mikimoto's salesmen had used to great effect in the Ginza shop. Mikimoto's strategy to avoid discrimination was, in effect, to redefine the company's products as a comparable, and in certain ways preferable, alternative to natural pearls. For example, when "first class" pearl purveyors around in the world began to require documentation proving that the pearls they bought were not cultivated, Mikimoto came out with his own certificates of guarantee in Ginza. The certificates made explicit his attempts to link his company's pearls with what he called "other genuine pearls."⁶⁸⁰ The company's advertising in the United States also at times emphasized distinction through aristocratic patronage, noting that the company operated "By Warrant of Appointment to Their Majesties of Japan."⁶⁸¹ As with the company's counterparts in Japan, overseas employees framed Mikimoto's relationship to the imperial family as that of a European-style purveyor to the king.

Not long after Seo Juzō's arrival on Fifth Avenue, coverage of Mikimoto in *The Jewelers' Circular*, New York's leading pearl and precious stone trade journal, noted that Mikimoto reserved his best pearls for the United States market before sending any to his

⁶⁸⁰ One example of Mikimoto's certificates of guarantee was published in the *Deutsche Goldschmiede-Zeitung* n. 3 (1927), held in the Natural History Museum Vienna Department of Mineralogy Archives. The individually numbered certificate, which lists the Ginza shop's address and includes Mikimoto's signature, states that "The pearls from my culture farms are real and true pearls, as they are grown in the living oyster under better conditions than other pearls. I, therefore, guarantee that they will give the same satisfaction and wear quite as long and as well as other genuine pearls."

⁶⁸¹ *The Jewelers' Circular* v. 104 (February 1934), pp. 34-35. The language of imperial patronage had been a feature of Mikimoto's Japanese-language newspaper advertising since the early 1920s.

Toba auction.⁶⁸² In Manhattan, Seo Juzō took those pearls to a different clientele. One buyer was Yamanaka Shōkai, one of the oldest and largest conduits of imported Japanese and Chinese art objects in North America.⁶⁸³ Where Saitō had looked to create a retail space distinct from Japanese department stores like Mitsukoshi, Seo aggressively sought out orders from jewelry buyers at some of New York's larger retailers. Among these was the Broadway branch of Wanamaker's, where Philadelphia retailer John Wanamaker and his son had long intermingled commerce and spectacle in shop windows and showrooms.⁶⁸⁴ The jewelery department at Wanamaker's became Seo's single largest client in the late 1920s.⁶⁸⁵

Pearl Island

Mikimoto and his employees devoted significant energies to speak on behalf of pearls in America. Relaying images of pearl cultivation to a broader public became one of the company's primary activities after the Paris trials and the opening of the New York shop. Mikimoto's emissaries were central to efforts to promote the company's products by introducing audiences to its production methods—and by inviting people to come to

⁶⁸² "Japanese Cultured Pearl Buyers at the Home of K. Mikimoto," *The Jewelers' Circular* v. 96, 10 May 1928, 91.

⁶⁸³ Kuchiki Yuriko, *Hausu obu Yamanaka: Tōyō no shihō o ōbei ni utta bijutsushō* (Tokyo: Shinchōsha, 2011).

⁶⁸⁴ For a seminal work of American cultural history that focuses on the rise of Wanamaker's as a forerunner of twentieth century consumerism, see William Leach, *Land of Desire: Merchants, Power, and the Rise of a New American Culture* (New York: Pantheon, 1993).

⁶⁸⁵ Wanamaker's accounted for 8,300 dollars of Seo's total December 1927 sales of 20,000 dollars. Seo Juzō to Mikimoto Kōkichi, 29 December 1927, located in MPIMA.

Japan to see, and ideally write home about, a variety of cultivation that was staged to be both cutting-edge and timeless.

Mikimoto made new efforts to turn the process of pearl cultivation itself into an object of consumption along with his pearls. In Japan, his salesmen company eagerly sought out passengers who arrived on the foreign cruise liners that regularly docked in Yokohama.⁶⁸⁶ One of the ways they lured visitors to the Ginza shop—rebuilt, along with much of the district, after the 1923 Great Kantō Earthquake—was the prospect of free film screenings. *Ama* divers took center stage in a reel entitled “Romance of the Cultured Pearl.” After 1930, the film and others like it found viewers in a second floor room in the remodeled Ginza shop.⁶⁸⁷ Film reels also traveled abroad, for screenings arranged by Mikimoto’s salesmen and by Japanese embassies that, as in France, lent copies to interested parties.⁶⁸⁸ “The cinema films disclose clearly every step in the production of cultured pearls,” wrote a reporter for *The Japan Times*. The film’s disclosure of “every step” of pearl cultivation, however, was a selective display of comprehensiveness. “The Romance of Pearl Culture in Japan” elided longer debates over patents and the manipulation of shellfish. Legal battles were not, to be sure, what sold pearls. In any

⁶⁸⁶ My perusal of early 1930s issues of *The Japan Times and Mail* suggests that specific appeals to cruise line passengers emanated from a wide range of Japanese retailers in the vicinity of Yokohama and Tokyo.

⁶⁸⁷ *The Japan Times and Mail*, 6 February 1930; *Mikimoto shinju hatsumei 100 nenshi*, 91.

⁶⁸⁸ Mikimoto appears to have brought the film with him in 1927 to London, where his agent Samuel Jones arranged a public viewing. As Jones put it, “You will later on see a film of Mikimoto’s fisheries, and this will give you in a clear and concise manner the way we have brought our fisheries to a fine art.” Samuel L. Jones, “A Talk on Cultured Pearls,” *The Watchmaker, Jeweler, Silversmith and Optician* (June 1927), p. 1041. For other accounts of company film screenings, see *Bulletin du Muséum d’histoire naturelle* (November 1929), p. 339; “Film Discloses How Round Pearl Is Made,” *Boston Globe*, 29 May 1932; *The Times of India*, 3 March 1933; *The Japan Society of London Transactions and Proceedings v. 33 1935-1936*, p. xix.

event, what captured viewers more than the maps of Mikimoto's far-flung farm network, or the paper hand manipulating a paper nucleus into a paper oyster, were images of *ama* divers and technicians at work with living shellfish. As the reporter for *The Japan Times* described it, "Through skillful photographing the calm bay at Yamada, where one of Mikimoto's ten oyster farms is situated, scenes of women divers in white bathing suits plunging from boats into the sea with baskets for the oysters, pictures of undersea marine life and the Mikimoto laboratories at Yamada are most interestingly depicted."⁶⁸⁹

The company's centerpiece of cultivation was not in Ginza. Rather, it could be found on the "Yamada" farm in and around Pearl Island (*Shinjugashima*), a landmass sitting just over one hundred meters from the shore in Toba's harbor. Even as Mikimoto's cultivation operations relocated pearl oysters to cages and his female workforce out of the water and into shellfish surgical wards, Pearl Island put shellfish *ama* divers on display in the flesh. It was a new captive environment not for animals but for people. "Pearl Island" was Mikimoto's name for the island of Ojima. Before it became a theme park, Ojima had housed coal and other supplies for the Japanese navy and later for the Imperial Steamship Company (the *Teikoku kisen kabushikigaisha*). Visions of a new tourist attraction—along with the post-World War I closing of the Imperial Steamship Company's Toba shipyard—underlay the town's 1928 gift to Mikimoto of a former storage site inherited from the company. Under Mikimoto, the island was slated to become an "amusement area." Mikimoto quickly moved to transform the hilly island into a exhibition space dotted with

⁶⁸⁹ *The Japan Times and Mail*, 6 February 1930.

freshly planted trees and home to a fully stocked fishing pond. Another arrival was Mikimoto's childhood home, which was transported and reassembled from its previous resting spot on the far shore in Toba. On Pearl Island, it became a small museum.⁶⁹⁰

The island was central to a Mikimoto narrative of family invention. By the late 1920s and into the 1930s, published accounts began to locate Mikimoto's late-nineteenth century semi-spherical pearl invention on Ojima. The island was where Mikimoto claimed to have discovered his first pearls in 1893, alongside his late wife Ume, in several of the shellfish they had moved from Mikimoto's first Ago pearl oyster plot in the wake of an 1892 outbreak of *akashio* discolored water in the bay.⁶⁹¹ The island pointed to a cultivation origin story that avoided discussion of contested early twentieth century claims over patents and fishing rights through the contrivance of predating them. The story, moreover, was visual and tactile. Pearl Island staged elements showcased in films like "Romance of the Cultured Pearl," according to modes of hospitality cribbed from earlier visits by members of the imperial family and foreign zoological observers. Above all, the island was designed for the display of pearl cultivation in action. The floating rafts and oyster-filled metal cages in the waters around some parts of the island came to resemble the Gokasho farm in miniature. Yet without question, the island's primary attraction was its female *ama*, clothed in matching white costumes of a type Mikimoto

⁶⁹⁰ *Kōtaigō heika gyōkeiki, Mie ken hen* (Tokyo, 1938), p. 120.

⁶⁹¹ Kuru Tarō discusses how, during the early twentieth century, Mikimoto publicly shifted the date of the company's first semi-spherical pearls back in time from 1894 (the year, as we have seen, of his first patent application) to an 1893 moment of invention on Ojima/Shinjugashima. See Kuru Tarō, *Shinju no hatsumeisha wa dare ka?: Nishikawa Tōkichi to Tōdai purojekuto* (Tokyo: Keisō shobō, 1987).

had required divers in his employ to wear since the early twentieth century. By the 1920s, the company's marine operations were moving from the seafloor to the surface with the company's system of pearl oyster cages suspended from wooden rafts. Even so, it was smiling and white-suited *ama*—to a far greater extent than the surgical manipulation of shellfish and nucleus implantation—who came to symbolize the company's pearl farming methods.⁶⁹² Visitors watched from the island as divers jumped from boats and grabbed *akoyagai* pearl oysters. Tourists within the empire began to arrive *en masse* aboard ferries that shuttled paying customers from the mainland to the island and back. Sitting next door to a boom in pilgrimages to Ise Shrine, Pearl Island's annual attendance peaked at over 130,000 visitors in 1937 and remained at over 100,000 per year through 1941.⁶⁹³

Not all foreigners welcomed the growth of tourism in Toba and the environs of Shima. Pan-Pacific Union director Alexander Hume Ford lamented the changes taking place on the island and its environs: "But alas, at Toba the Government has asked Mr. Mikimoto the pearl king, to put one of his experiment stations here that the tourists may come and see the way pearls are cultured and how the girls dive for the oyster shells. Well, may that keep them in their hideous modern dress from the rest of the peninsula."⁶⁹⁴ In a sense, Ford's grumblings were off the mark; Pearl Island's role as a site

⁶⁹² See, for example, the pamphlet. *Mikimoto Pearls: Real Pearls Cultured* (New York, undated).

⁶⁹³ Pearl Island's yearly attendance records are as follows: 138,265 (1937), 133,580 (1938), 119,903 (1939), 120,720 (1940), and 102,380 (1941). *Mikimoto shinju 100 nenshi*, p. 295. School trips to Ise Shrine exploded during the 1930s; more than two million students visited in 1939. Helen Hardacre, *Shintō and the State, 1868-1988* (Princeton: Princeton University Press, 1989), pp. 108-110.

⁶⁹⁴ *The Japan Times*, 31 March 1931.

of mass entertainment existed from the start alongside its status as Mikimoto's exclusive property. Indeed, Mikimoto occasionally shut down the island for the entertainment of certain visitors. Ford saw "the way pearls are cultured" from the other side of the shore, as a guest in Mikimoto's landed Toba estate. Along with the handful of Americans who had come as Mikimoto's guests to southern Mie before Pearl Island's 1929 opening, Ford received a reception fit for the imperial family. Among Mikimoto's special guests was Maurice Holland, the director of engineering and research at the United States National Research Council and someone who had published about "The Romance of Pearl Culture in Japan" after meeting Mikimoto in New York several years before.⁶⁹⁵ Gokasho Bay was on Holland's itinerary when he brought a group of American delegates to the Tokyo World Engineering Congress in 1929. "I feel sure that I speak for all of them when I say the visit to your pearl farm was the outstanding high light [sic] of their entire trip to Japan," wrote Holland to Mikimoto. "As a result of their visit you now have in America, ten very influential friends who will sing the praises of your scientific achievements and acknowledge the greatness of your contribution to the sciences."⁶⁹⁶ Many of the protocols for Ford and Holland's visits mimicked those first tried on visitors from the Japanese imperial household. One that received particular acclaim in English-language travel writings was an edible re-creation of pearl discovery: a course of freshly gathered fried

⁶⁹⁵ Maurice Holland, "The Romance of Pearl Culture in Japan," *Travel* (October 1928), pp. 13-17, 43.

⁶⁹⁶ Maurice Holland to K. Mikimoto, 18 November 1929, located in MPIMA.

akoyagai meat, served inside a bivalve shell, each containing a pearl or two stuffed back inside its flesh.⁶⁹⁷

Pearl Island became a space for hosting each of the audiences to whom Mikimoto had long appealed for support: the imperial household, Tokyo and Mie elites, and foreign guests. It was a frequent stop for foreign journalists: the first overseas visitors to the newly constructed Pearl Island included an invited contingent of reporters from the *New York Times* and several other American newspapers.⁶⁹⁸ Mikimoto entertained a near-constant stream of diplomats, journalists, newsreel cameramen, scientists, and casual tourists at his Toba estate and Pearl Island. Male diplomats (like Belgium's Shanghai consul in 1935) and other high officials (like the Brazilian Minister of Agriculture in 1937) arrived along with their wives and children. In all, at least 86 foreign groups and individuals arranged formal visits to Pearl Island between 1929 and 1941 (this does not count other tourist visits to the island). Over forty percent of the visits were made by Americans.⁶⁹⁹

Ginza film screenings and visits to Toba were part of Mikimoto's spectacle of cultivation and invention. The captive environments his employees produced in Japan, however, existed alongside upheaval in other places where his pearls went.

⁶⁹⁷ See, for example, James A. B. Scherer, *Japan's Advance* (Hokuseido Press, 1934), pp. 80-81; Frederick Lajtha, *The March of Japan* (New York: Frederick A. Stokes, 1936).

⁶⁹⁸ See, for example, Herbert L. Matthews, "With Japan's 'King of Pearls,'" *The New York Times*, 29 September 1929.

⁶⁹⁹ These are my counts from Ototake Iwazō, *Denki Mikimoto Kokichi*, pp. 310-322.

From Wall Street to Fifth Avenue to Gokasho

After October 1929, the single ledger line that together accounted for American imports of natural and cultured pearls shrunk rapidly. Wall Street's downturn quickly came to Seo Juzō on Fifth Avenue. Mikimoto cited Seo's reports of plummeting Christmas sales to justify his decision to shutter the Gokasho Bay farm for the first few months of 1931.⁷⁰⁰ The cultured pearl trade further changed after 1932, with the combined effects of the yen devaluation and the cultivation boom in Ago Bay.

In New York, Seo Juzō soon noticed new groups of American purveyors who were selling cultured pearls to department stores like Gimbel's, Wanamaker's, and Saks Fifth Avenue. "After five years of patience it looked as though the time had come for us to be rewarded," wrote Seo just weeks after Mikimoto's massive Kobe pearl burning, "but as low quality pearls have proliferated, our long-awaited turn for the better is turning into a time of setback."⁷⁰¹ Mikimoto sales to Macy's were down to a tenth of their former levels, Seo reported in December 1932. Some of Seo's previous clients began to balk at the company's higher wholesale prices. When Seo asked for twelve to fifteen dollars a strand, New York pearl buyer Milton Heller offered eight.⁷⁰²

Most distressing to Seo and his employer Mikimoto was the possibility that cultured pearls might fall to the price of imitation glass pearl jewelry, an industry that

⁷⁰⁰ Seo Juzō to Mikimoto Kōkichi, 12 December 1932, located in MPIMA.

⁷⁰¹ Seo Juzō to Mikimoto Kōkichi, 3 November 1932, located in MPIMA.

⁷⁰² Seo Juzō to Mikimoto Kōkichi, 12 December 1932, located in MPIMA.

began to boom in Osaka during the First World War.⁷⁰³ This was not just a question of price distinctions, but of status distinctions. Along similar lines to Lucien Pohl's reports from Paris, Seo observed that dealers in imitation pearls were turning to the trade in inexpensive cultured pearls. Mikimoto remained alone among other Japanese pearl cultivators in selling directly overseas in places like New York. However, New York buyers—foremost among them sometime imitation pearl importers Leys Christie & Co., Jack Felsenfeld, and the Heller family (which had also worked as Mikimoto's semi-spherical pearl consignment agent)—also sought to purchase their cultured pearls overseas, in Yokohama and especially in Kobe. Seo cautioned that there were “two or three” companies buying up necklaces for forty yen and under. “It is now possible to get high-quality pearls for half the price of our New York shop.”⁷⁰⁴

The contradiction in this statement, as we have seen in the previous chapter, was that Mikimoto had himself undertaken a massive expansion of his cultivation infrastructure just after the Wall Street crash. Well into the 1930s, moreover, Mikimoto's largest farm remained a focus of efforts to move marine pearl cultivation to American shorelines. Until its announced closure in 1936, Mikimoto's Gokasho cultivation headquarters was a model of marine industrialization. Some of the people who saw or heard about Mikimoto's methods hoped to bring them home in other ways. What they sought to recreate was the working bayscape of Gokasho Bay.

⁷⁰³ Seo Juzō to Mikimoto Kōkichi, 12 December 1932. See, for example, *Osakafu-ka ni okeru chihōteki kanai kōgyō gaikyō* (Osaka: Osakafu naimubu, 1926), pp. 107-109.

⁷⁰⁴ Seo Juzō to Mikimoto Kōkichi, 12 December 1932, held in MPIMA.

A straight line connecting Kaneohe Bay to Hawaii's Pearl Harbor cuts across twenty-odd miles of Oahu's volcanic soil. People living outside the Hawaiian islands might have been forgiven for confusing the two bodies of water for several years just after 1930, however, when Kaneohe became host to 313 living (and, many hoped, reproducing) pearl oysters of a variety that would later be dubbed a subgenus of *Pinctada margaritifera*. All had come from waters off Pearl and Hermes Reef, a suitably named atoll located not far from Midway Island at the hazy western edge of America's Pacific territories, well over one thousand miles from their final destination in Oahu. They had arrived along with at least two Filipino divers and one of America's foremost shellfish experts, a Russian-born zoologist in the U.S. Fisheries Bureau named Paul Galtsoff, whose services the American territorial government in Hawaii had requested not long after it caught wind of reports that pearls from the reef's shellfish had sold for several thousands of dollars in Paris. Fearing the rapid exploitation and collapse of the American empire's only known source of saltwater shellfish capable of bearing marketable pearls, Galtsoff pointed to Kaneohe's waters as a promising site in which pearl oysters might reside.⁷⁰⁵

Kaneohe and its newly arrived pearl oysters were on the mind of Alexander Hume Ford in early 1931, when he toured Mie prefecture as a guest of Mikimoto Kōkichi. "About me are beautiful bays which each year are planted with some 5,000,000 pearl oysters. Each oyster has a potential value of at least \$5 and the area from which they come does not exceed that of Pearl Harbor or Kaneohe Bay," reported Ford to readers of the

⁷⁰⁵ P. S. Galtsoff, "Pearl and Hermes Reef, Hawaii, Hydrographical and Biological Observations," Bulletin 107 (Honolulu: Bernice P. Bishop Museum, 1933).

Honolulu Star-Bulletin and members of the Pan-Pacific Research Institution.⁷⁰⁶ In Mie Prefecture, Ford saw five million (or, to be more precise, twenty five million) reasons to bring up the possibility of a new venture closer to home. “I have spent some days with Mr. Mikimoto, the inventor and patentee of the process of compelling oysters to manufacture pearls to order. He is deeply impressed with the idea of establishing pearl culture gardens in Hawaiian waters, and wishes the cooperation of the Pan-Pacific Research Institution and our Industrial Committee in this enterprise.”⁷⁰⁷

Alexander Hume Ford’s proposal to lure Mikimoto to Hawaii was just one among several attempts during the 1920s and 30s to persuade Mikimoto to bring the Gokasho Bay system of spherical pearl cultivation to shores outside the Japanese empire. One of the first had come from Mikimoto’s agent Lucien Pohl and his supporters in the Paris Museum of Natural History. In 1928, Pohl had delivered a detailed proposal to Mikimoto’s manager Ikeda Kakichi to open a pearl farm, with Lebanese financial backing, in the Red Sea.⁷⁰⁸ The year before that, the zoologist Paul Galtsoff had traveled with Mikimoto to Florida in an effort to get a second opinion (a negative one, it turned out) about the suitability of the waters off Key Largo for pearl oyster raising.⁷⁰⁹

⁷⁰⁶ Alexander Hume Ford, “Pearl Culture Possibilities in Hawaii Seen,” *Bulletin of the Pan-Pacific Union* n. 135 (May 1931), p. 9.

⁷⁰⁷ Alexander Hume Ford, “Pearl Culture in Hawaii,” *Journal of the Pan-Pacific Research Institution* v. 6 n. 3 (July-September 1931), p. 14.

⁷⁰⁸ Letter from Lucien Pohl to Ikeda Kakichi, 8 June 1928, in Paris Museum of Natural History Bibliothèque de Malacologie.

⁷⁰⁹ Ototake Iwazō, *Mikimoto Kōkichi* (Tokyo: Baifūkan, 1948), pp. 119-120; *Annual Report of the Commissioner of Fisheries to the Secretary of Commerce for the Fiscal Year Ended June 30, 1927* (Washington, D.C., 1927), p. 192.

In the end, Mikimoto turned down or politely ignored each and every request to move his operations overseas. Mikimoto's decision not to base a farm in Kaneohe Bay—or, for that matter, in the Red Sea or elsewhere in the French empire—did not mean that the boundaries of pearl cultivation were stable. The bottom line, however, was that falling prices and low tariffs provided an easy excuse not to pursue Ford's offer. As Mikimoto employee Yokohama Reikichi told readers of the *Ise Shinbun*, "because tariffs there are only around ten percent, there is no need to go to the trouble of setting up a pearl farm in the United States."⁷¹⁰

Meanwhile, Mikimoto's employees adjusted their sales methods in response to growing numbers of the company's own Gokasho Bay pearls.⁷¹¹ Mikimoto's public comments at his 1932 Kobe pearl burning reflected conflicting desires both for higher cultured pearl prices and for higher (and highly gendered) cultured pearl sales. "My wish is to drive out the world's natural pearls and replace them with plenty of Japanese cultured pearls," said Mikimoto as onlookers laughed in approval. "This is entirely up to women. Men want at most one pearl per person, but with women it is different—a single pearl necklace uses thirty or even fifty pearls. I think women are great. I think women are much better than men."⁷¹² Cultured pearl prices fell to a tiny fraction of what they had been in the '20s. In late 1930s Chicago, the Marshall Field department store offered Mikimoto necklaces for as little as ten dollars a strand, a far cry from the nine hundred

⁷¹⁰ *Ise Shinbun*, 6 March 1931.

⁷¹¹ *Mikimoto shinju hatsumei 75 shūnen*.

⁷¹² *Kōbe yūshin nippō*, 11 October 1932.

dollar necklaces that Wanamaker's sold before the crash.⁷¹³ All the while, Mikimoto's salesmen looked to holidays, movie tie-ins, and an aggressive focus on female customers in efforts to inspire additional sales. World's fairs became opportunities to mix pearls and icons of Americana in ways that symbolized Mikimoto's dependence on American demand—and his company's continued close relationships with Japan's Foreign Ministry. After the 1933 Chicago World's Fair, the outgoing Japanese ambassador to the United States, Debuchi Katsuji, donated the company's exhibit of a pearl-encrusted scale model of George Washington's Mount Vernon estate to the Smithsonian Museum.⁷¹⁴ Mikimoto's wholesaling network expanded its locations throughout the United States as well.⁷¹⁵ In the run-up to the 1932 Los Angeles Olympics, Mikimoto ordered the formation of a branch in the city (though it soon relocated to San Francisco). After the 1933 Chicago World's Fair a local office opened under the supervision of a salesman from the company's New York office.⁷¹⁶

The Pearl Associates

Distress on Wall Street reverberated uptown to the “first class” shops Seo had observed on Fifth Avenue as well. Its effects would soon be felt in France, where Paris-based pearl

⁷¹³ *Chicago Daily Tribune*, 19 May 1939.

⁷¹⁴ “A Generous Gesture,” *The Atlanta Constitution*, 3 December 1933.

⁷¹⁵ Others in Mikimoto's employ made inroads into British India as well. Bombay had long served as the world's largest entrepôt for “natural” pearls gathered across the Indian Ocean. Mikimoto employee Suzuki Nichirō set up a branch there around 1930. See *Mikimoto shinju hatsumei 75 shūnen*.

⁷¹⁶ *Mikimoto shinju hatsumei 75 shūnen*.

wholesalers had put themselves into the leading position in the global trade in “Oriental” pearls since the early twentieth century’s first major financial crisis in 1907. A brief era of dominance began to erode in the aftermath of the crash as Paris pearl dealers lost their hold on Persian Gulf buying for the European market. The Banque Nationale de Crédit, for one, stopped lending to pearl wholesalers. As the bank began to call in outstanding debts in the early months of 1930, many of the most prominent pearl dealers in Paris went into bankruptcy.⁷¹⁷ Within a few years, many of the Paris-based merchants who ferried pearls from the Persian Gulf to New York had scaled back or left the trade entirely. Among them was *La Perle*’s editor, the dealer Jacques Bienenfeld. Near the end of *La Perle*’s print run, Bienenfeld highlighted the changing fortunes of the trade with a few “eloquent figures” (*chiffres éloquents*) that indicated the extent to which the Persian Gulf-Paris-New York circuit had deteriorated: the value of United States pearl imports during the month of October 1931 (\$1,575,098) was only one-twentieth of the level just two years prior (\$76,587).⁷¹⁸ The world’s wealthiest pearl dealer (and possibly France’s wealthiest citizen), Bienenfeld’s close friend Léonard Rosenthal, stopped sending his brother to make multi-million franc cash purchases in Bahrain.

“The repercussions of the economic crisis are wide. The latest victims are the pearl fishers of the Persian Gulf, whose catch is up to standard but whose market is distinctly below par,” noted *The Manchester Guardian*.⁷¹⁹ One of those repercussions was that, for

⁷¹⁷ Voluminous bankruptcy records are held in the files “Affaires Diamantaires,” Archives du Monde du Travail (AMT), Lille, France.

⁷¹⁸ *La Perle* v. 9 no. 2 (February 1932).

⁷¹⁹ *The Manchester Guardian*, 1 October 1931.

the first time in at least a hundred years, many people in Europe and the United States ceased to think of natural pearls as appreciating investments. Faith in the long-term value of precious stones and precious metals soured in the early 1930s world where gold had ceased to be the basis of multiple national currencies and where many thought twice about purchasing new items of jewelry. “Gold, diamonds, and pearls have stood for many centuries as the symbols and attributes of wealth and luxury,” read one Australian newspaper article. “Possibly the beginning of their story goes back beyond the dawn of written history. Even to the present generation the connotation of the words, to most people, is that of riches and magnificence. Nor can we say that their dominant position is at or nearing its end. Taking an extended forward view, however, the writing is on the wall; we can perceive the possibility of their end.”⁷²⁰

Responses to falling post-1929 American jewelry sales included the unprecedented restructuring of the De Beers diamond cartel under Ernest Oppenheimer.⁷²¹ Yet even after prices for diamonds began to stabilize, prices for natural and cultured pearls alike were a tenth or less of what they had been before the Wall Street crash. Tellingly, some of America’s leading pawnshops stopped accepting purportedly natural pearl necklaces as collateral for loans.⁷²² The terms of connoisseurship and the more recent fall in prices fed into each other, as *Washington Post* columnist Damon Runyan illustrated:

⁷²⁰ *The Australasian*, 3 October 1931.

⁷²¹ See, for example, Edward Jay Epstein, *The Diamond Invention* (Hutchinson, 1982).

⁷²² Damon Runyan, “The Brighter Side,” *The Washington Post*, 8 March 1939.

We once heard an old time jewel trader say a good thing about imitations to a wealthy lady to whom he was trying to sell a first class emerald. He also showed her an imitation emerald of about the same size and cut as the real one, though of course the price of the imitation was nowhere near that of the genuine article. The lady said to him: "I'm of a mind to buy the imitation. If I bought the real one, no one would know it is real, would they?"

"Yes madam," the dealer said, quietly, "you would know it."

We suppose that is the way owners of oriental pearls feel about their gems. Maybe no one else knows they are orientals, but they know it.⁷²³

The 1921 cultured pearl sensation had struck fear in disparate groups with interests in defending an enormous trade in non-cultivated "orientals." After 1929, the label "natural" covered a shrinking corner of the market in adornment. The decision to purchase a "natural" or "oriental" pearl, and not a "cultured" one, was no longer framed only in terms of marking one's social class for others to see, or of passing on an heirloom that could be resold at a higher price in the future, but rather in terms of satisfying an inner desire for authenticity that might not even be shared.

Nevertheless, the defense of distinctions between nature and culture through testing remained in force throughout the 1930s.⁷²⁴ As European entrepôts shrunk, the United States—by 1932 the purported home to "75 percent of the world's gems"—became a center for testing developments.⁷²⁵ The testing laboratory at Tiffany & Co. continued to pass incoming pearls through its Perrin-Chilowsky endoscopes. Growing interest in the

⁷²³ Damon Runyon, "The Brighter Side," *The Washington Post*, 15 March 1939.

⁷²⁴ The London Chamber of Commerce laboratory continued to examine thousands of its members' pearls each year. The Paris Chambre Syndicale's laboratory fared poorly. Facing decreasing demand from increasingly cash-strapped dealers, the Chambre Syndicale transferred the testing facility's instrumentation—including its X-ray diffraction setup, Chilowsky-Perrin endoscopes, and German-made Näcken magnetic pearl testing machine—to the Paris municipal government, which agreed to operate the laboratory as a public service under the leadership of G. Göbel. See the files in Chambre de Commerce de Paris, 2ETP/1/2/54–59, Archives de Paris (AP).

⁷²⁵ "U.S. Has 75 P.C. of World Gems, Kohn Declares," *New York Herald Tribune*, 30 November 1932.

testing of emeralds, sapphires, rubies, and other stones also came from a new quarter: the Gemological Institute of America, the Los Angeles-based organization founded in 1934 by a British-trained American named Robert Shipley. Shipley positioned his institute as a center for the scientific training of a new generation of retail jewelers. Yet as we have seen throughout, this did not mean the same things to all members of the trade. The second issue of the institute's in-house trade journal *Gems and Gemology* drew a flurry complaints from American pearl dealers, including the Jeweler's Association of New York, after it published a zoological defense of cultured pearls. A subsequent issue revised the institute's editorial position unequivocally in support of the separation of natural pearls from cultured ones.⁷²⁶

On Fifth Avenue, Seo Juzō pressed on with new efforts to persuade retailers to stock Mikimoto pearls. During the early 1930s, Seo described the company's products in *The Jewelers' Circular* as "cultivated" pearls," not "cultured" pearls as his competitors usually did. But he made attempts to placate natural pearl wholesalers as well. The year 1934 saw the appearance of the first national American guidelines for pearl labeling, the Code of Fair Competition for the Retail Jewelry Trade. Seo put out a two-page advertisement in the *Jewelers' Circular* announcing Mikimoto's grudging acquiescence to the new standards:

To the Code Authorities, the retail jeweler has pledged that he will not use the word "genuine" to describe the cultured or cultivated pearl...it is so written...

⁷²⁶ A. McC. Beckley, "The Scientists' View of the Cultivated Pearl," *Gems and Gemology* v. 1 n. 2 (March-April 1934), pp. 43-44; "Cultivated Pearls Not Genuine," *Gems and Gemology* v. 1 n. 4 (July-August 1934), pp. 110-113.

The oyster goes about its pearl production for Mikimoto in the exact manner it labors for Nature, unwitting of man's codes and concepts...It is so ordained...⁷²⁷

Seo promised not to call Mikimoto pearls “real,” “genuine,” or “natural,” terms forbidden under the code to describe all things “artificially cultured or cultivated.” Even so, the advertisement did remind others in the trade that the new labeling standards reflected Mikimoto’s adherence to local rules, not a change in the company’s fundamental position about its process and products.

For their part, American wholesalers and retail purveyors of natural pearls feared the ubiquity of claims that cultured pearls were either substitutes for, or even fundamentally identical to, natural ones. They sought not only to detect cultured pearls and enforce labeling standards, but also to deflect public perceptions of the equivalence between nature and culture. As natural pearl networks deteriorated, dealers in New York (and in London) also kept abreast of and responded to promotional campaigns by Mikimoto and other cultured pearl purveyors. Their problem became not simply one of testing pearls, but of persuading retail purveyors of pearls and retail customers to demand “genuine” pearls in the first place.

In New York, pearl dealers sponsored a coordinated campaign in order to bring the natural pearl back into favor. A group including Jacques Cartier and several other wholesalers joined together to form the Pearl Associates. In 1938, they hired Sigmund Freud’s nephew Edward Bernays, a pioneer of public relations, to design “propaganda”

⁷²⁷ *The Jewelers’ Circular* v. 104 (February 1934), p. 34.

around the natural pearl.⁷²⁸ One year before the De Beers corporation employed the advertising firm of N. W. Ayers to promote retail diamond sales under a relationship that in 1948 would result in the slogan “Diamonds are forever,” Bernays embarked upon a similar (though far less well known) effort to revive the natural pearl’s fortunes.⁷²⁹

The Pearl Associates intended their activities “to meet the problem of creating a larger market for natural pearls in the United States and to bring about a better understanding by the American people of the place of natural Oriental pearls among precious gems.” In order to accomplish this, Bernays spearheaded a program of opinion gathering and publishing through an organ known as the Bureau for Natural Pearl Information. Bernay’s methods for the Bureau took the form of mass surveys and the creation of pedagogical materials. In one instance, the Bureau sent a letter to 1,000 “leading fact-finding organizations” in order to “build up a complete and comprehensive bibliography of pearl literature.” The information was collected into dossiers organizing “valuable and interesting information for projection to the public,” under headings that included “Famous Pearls,” “Natural vs. ‘Cultured’ Pearls,” and “Romance of the Pearl.” This material, in turn, became part of a “study outline,” beginning with “History and Romance of the Pearl,” that went to women’s clubs in North Carolina and elsewhere in the country.⁷³⁰

⁷²⁸ Much of Bernays’s work with the Pearl Associates can be found in Edward L. Bernays Papers, Box I: 303 and Box I: 617, Library of Congress Archives, Washington D.C. (LOC).

⁷²⁹ Edward L. Bernays, *Biography of an Idea: Memoirs of Public Relations Counsel Edward L. Bernays* (New York: Simon and Schuster, 1965), 586-590.

⁷³⁰ Edward L. Bernays Papers, Box I: 617, LOC.

In January 1939, surveys went out to American pearl purveyors “to ascertain what resistance is being met by the retail jeweler in the sale of natural pearls.” Their responses indicated a sense that glass “artificial” and especially “cultivated” pearls had made it harder to sell natural ones. Just as problematic to one retailer was “their lack of re-sale value.” The same retailer’s solution to the problem that natural pearls were losing their exchange value was that “their cost should be under-emphasized and their distinction emphasized.” This, however, was precisely what Mikimoto’s New York advertising described in the same kind of paradoxical idiom that had emerged elsewhere in depression-era America: “Luxury Within Reach of All.”⁷³¹ The natural pearl’s fungibility with the cultured pearl as an object adornment and its decline vis-à-vis diamonds and gold as a commodity presented vexing challenges for anyone who tried to wear them, sell them, resell them, or pawn them. As another survey respondent wrote, “‘Why pay the price of real pearls when you can buy a cultured pearl necklace that looks just as nice.’ We hear this from customers every day.”⁷³²

The Bureau for Natural Pearl Information attempted to counter such views through media coverage that appealed to the methods by which natural pearls reached the United States. In a decade during which members of the precious stone trade had begun to assuage fears of collapsing values by compiling and publishing centuries-long charts of price movements for diamonds, emeralds, and rubies, Bernays and the Pearl Associates noted the longevity of Bahraini pearl diving practices, ironically at a time when

⁷³¹ Edward L. Bernays Papers, Box I: 617, LOC.

⁷³² Edward L. Bernays Papers, Box I: 617, LOC.

several years of lowered overseas demand and the rise of oil was transforming labor relations in the Persian Gulf. “For 2000 Years Bahrain Has Lived on Its Gems,” went one of the press releases. Print-ready press releases reached newspapers and magazines by the dozens in newspapers throughout the early months of 1939. It was a narrative of longstanding benevolent rule that undoubtedly pleased Sheik Hamid of Bahrain, who had agreed the year before to contribute 17,000 rupees to the Pearl Associates.⁷³³

Bernays and the Pearl Associates spoke of tradition. Even so, they also underscored the possibility of further refining distinctions between nature and culture through machine mediation. They funded a fellowship for a young scientist named A. E. Alexander at Pittsburgh’s Mellon Institute. Housed in one of the premier locations for engineering research in the early twentieth century United States, Alexander developed a fluoroscopic X-ray method for examining entire pearl necklaces. His observation was that freshwater pearls and shell fluoresced under X-ray but their saltwater counterparts did not, a phenomenon he attributed to the presence of manganese in the former. Because saltwater cultured pearls were defined by the presence of an implanted sphere of freshwater shell, any fluorescing object strung on a purportedly non-cultivated saltwater “oriental” pearl necklace could be singled out as a suspect.⁷³⁴ One of the apparatus’s key features was mechanical: the device conveyed each necklace one pearl at a time across the opening of

⁷³³ “Pearl Propaganda,” *The Times of India*, 7 December 1938.

⁷³⁴ A. E. Alexander, “Natural and Cultured Pearl Differentiation,” *Gems and Gemology* v. 3 n. 11 (Fall 1941), p. 172; “Researches of Mellon Institute 1940-1941,” *Chemical Engineering News* v. 19 no. 7 (1941), 390. One unspoken irony of Alexander’s method to detect “Japanese” cultured pearls was that, by the 1930s, Mikimoto and other cultivators were making a large proportion of their nucleating material from shellfish gathered in American rivers.

the cathode ray tube, allowing for rapid testing.⁷³⁵ Following his fellowship in Pittsburgh, Alexander brought his X-ray apparatus with him to the Bureau of Natural Pearl Information's New York offices. Just as importantly, he published articles at a furious pace, each time comparing natural pearls favorably to cultured ones. "Like chests of silver, pearls never go out of style, nor does their value decrease with the generations," wrote Alexander in *Scientific American*.⁷³⁶ The Bureau for Pearl Information promptly distributed copies to all interested parties.⁷³⁷

The geopolitical outlines of commercial order took diverging forms on Fifth Avenue. Natural pearl dealers pursued a dual track of strengthening countermeasures against cultured pearls and promoting the value of their own. Theirs was a vision of the natural pearl as a class of object that was as much investment as adornment. By contrast, Mikimoto and his employees tried to persuade American retail and wholesale consumers both to buy Japanese, even if war in China inclined them against Japanese products, and to buy Mikimoto, even if costume jewelry or less expensive varieties of cultured pearls beckoned. Theirs was a vision of Mikimoto pearls in the form of necklaces that sidestepped concerns about naturalness and nationality.

⁷³⁵ "New X-Ray Camera 'Fingerprints' Pearls, Distinguishes Natural from Cultured," *Popular Science* (April 1941), p. 60.

⁷³⁶ A. E. Alexander, "Science Dissects the Pearl," *Scientific American* n. 5 (1939), p. 297.

⁷³⁷ Edward L. Bernays Papers, Box I: 617, LOC.

Peaceful Scenes

After 1931, Mikimoto reframed his company's hospitality as a counterpoint to Japan's deepening military involvement on the Asian mainland and as a bulwark against rising anti-Japanese trade friction.⁷³⁸ In early 1932, Mikimoto indicated a desire for "military retrenchment" (*gunshuku*) in the wake of Japan's "Manchuria problem."⁷³⁹ Two months after his comments, members of the League of Nations Lytton Commission, who had come to investigate the circumstances surrounding the incident, found themselves watching female divers at Pearl Island before heading out on a six week fact-finding mission in Manchuria.⁷⁴⁰ Following the commission's report and Japan's withdrawal from the League of Nations in 1933, Mikimoto continued to host entourages from the United States and, after the 1936 anti-Comintern Pact, from Japan's newer allies of Nazi Germany and Fascist Italy.⁷⁴¹ Representatives of the 1935 American Economic Mission in the Far East, led by former American ambassador to Japan W. Cameron Forbes, also visited Pearl Island on their tour of China and the Japanese empire.⁷⁴² "The business is the product of

⁷³⁸ Like other Japanese exporters, Mikimoto warned against military conflict that might result in fewer overseas handshakes in the future. This dynamic could be seen among leaders of Japan's cotton textile trade, which was at the heart of British concerns over rising Japanese exports to British colonies and dependencies during the 1930s. See William M. Fletcher, *The Japanese Business Community and National Trade Policy, 1920-1942* (UNC Press, 1989); Hiroshi Shimizu, *Anglo-Japanese Trade Rivalry in the Middle East in the Inter-War Period* (London: Ithaca Press, 1986).

⁷³⁹ *Ise Shinbun*, 1 January 1932.

⁷⁴⁰ Accessed through the Japan Center for Asian Historical Records (JACAR). Reference Code B02030443400.

⁷⁴¹ For the visit of a Hitler Youth brigade to Pearl Island, see *Nagoya Shinbun*, 9 October 1938. In 1937, Mikimoto regaled a contingent of Italian visitors with tales of his earliest Meiji era sales of pearls to their Neapolitan countrymen. Ototake Iwazō, *Denki Mikimoto Kōkichi* (Tokyo, 1950), pp. 319-320.

⁷⁴² Mikimoto's employees noted that the vice-chairman of the mission asked to borrow a swimsuit and jumped into the water alongside several *ama* divers. Ototake Iwazō, *Denki Mikimoto Kōkichi*, pp. 314.

Japanese science and initiative and, in its line, is one of Japan's outstanding achievements," read the mission's official report.⁷⁴³

Even as Mikimoto's overseas employees grappled with natural and cultured pearl dealers, the American consequences of Japanese aggression on the Asian mainland were never far from their minds. On Fifth Avenue, Seo Juzō and other employees were at the forefront of efforts to portray cultured pearls in a positive light. Mikimoto's New York offices moved farther up Fifth Avenue to the International Building at Rockefeller Center in early 1936, where Seo set up offices in the same building as the newly formed state-supported bureau of Japanese cultural promotion, the Kokusai Bunka Shinkōkai.⁷⁴⁴ In the wake of the September 1937 Marco Polo Bridge Incident and the Japanese army's horrific siege of Nanjing, Seo Juzō's letters to Japan highlighted American attitudes toward Japan and China alongside the New York store's monthly sales figures. The December 12th Panay Incident, in which Japanese aircraft sank the American Navy gunboat *USS Panay* as it sat anchored on the outskirts of Nanjing, brought Seo's ongoing concerns over American opinion to the fore. Seo noted that some Americans were furious at Japan; others had begun to propose organized consumer boycotts of Japanese products. Seo marked trends of rising pro-China and anti-Japan sentiment that he had assayed in

⁷⁴³ *Report of the American Economic Mission in the Far East: American Trade Prospects in the Orient* (New York: National Foreign Trade Council, 1935), p. 11.

⁷⁴⁴ *The Jewelers' Circular* v. 106 no. 5 (1936).

voluminous American newspaper clippings. Most distressing of all was that the incident had dovetailed with New York's Christmas shopping season.⁷⁴⁵

Amid the growing prospect of American pearl boycotts, Mikimoto tried to make his company once again into a destination of retail and tourist consumption in Japan. On one hand, Japan's revived domestic wartime economy and lower cultured pearl prices drew Mikimoto and other purveyors closer to Japanese women. Unlike in the United States and Europe, where images of the women who might eventually buy pearls for weddings and graduations (both of which also aligned with the notion of the pearl as a June birthstone) were often part of a male-to-male language of wholesale selling, the company's advertisements in Japanese-language newspapers and women's magazines spoke directly to female consumers about a nearly identical suite of year-round buying opportunities—the summer *ochūgen* gift-giving season was, if anything, an additional sales chance. In the Japanese empire, the company's pearls were not simply cultured or cultivated (*yōshoku*), they were also “domestically produced” (*kokusan*) objects that had “shocked people overseas”—and which were not subject to the 100 percent Japanese tariff levied on diamonds and other imported precious stones.⁷⁴⁶

Whereas Mikimoto's employees reached out to American wholesalers primarily with images of Western women (and the occasional mermaid) clad in pearls, in Japan they courted retail customers—male and female, Japanese and foreign—with images of

⁷⁴⁵ Seo Juzō to Mikimoto Kōkichi, 17 January 1938, held in MPIMA.

⁷⁴⁶ *Asahi Shinbun*, 1 April 1932 and 27 September 1929.

ama divers and stories illustrating how a pearl necklace came to be.⁷⁴⁷ But overseas visitors to Japan saw a separate introduction to Mikimoto pearls in a new storefront that opened next to the Ginza flagship in 1935. The new shop specialized in the sale of pearl necklaces to a foreign clientèle. Heading it was Ono Hideko, a woman who had served as a Japan Tourist Bureau guide for visitors in metropolitan Japan and Manchuria.⁷⁴⁸ Screenings of films like the “Romance of the Culture Pearl” (or “Romance of the Cultivated Pearls,” as it was known in the 1930s) continued as well in Ginza. From late 1931 onward, films were shown in a purpose-built cinema annex that held more than twice the capacity—up to forty viewers—of the previous film room in the Ginza shop.

The new theater incorporated elements such as *shōji* paper sliding doors (and other “unique Japanese architectural features”) that evoked a sense of self-styled exoticism. *The Japan Times* simply noted that “The motion picture hall gives an entirely different impression from the modern atmosphere of the shop.”⁷⁴⁹ And in Toba, a steady trickle of foreigners visited Pearl Island, arriving at the rate of one per day in 1937.⁷⁵⁰ “One of the happiest memories of a recent short residence in Japan is that of my meeting with Kokichi Mikimoto, the Pearl King,” recounted one man to the *Sydney Morning Herald* in the fall of 1938. “When strolling along the Ginza, I entered the pearl store of Mikimoto

⁷⁴⁷ For one seven-page example of this in a widely circulating Japanese-language women’s magazine, see “Shinju no kubikazari no dekiru made,” *Fujokai* (August 1936).

⁷⁴⁸ *The Japan Times*, 12 November 1935.

⁷⁴⁹ *The Japan Times*, 24 December 1931.

⁷⁵⁰ Sakai Hideo, “Shinjūgashima,” *Kokoro no hana* (May 1937), p. 86.

and was courteously treated to a private showing of a film depicting the culture of pearls at Ise Bay. The peaceful and picturesque occupational scenes in the film often recurred to me in the ensuing few weeks spent amid the industrial turmoil of the war-conscious, seething cities of Yokohama, Osaka, Kobe, and Nagoya.” The man subsequently made his way from Tokyo to Pearl Island.⁷⁵¹

The Real War

“Peaceful scenes” surrounded the highly publicized appearance of Mikimoto pearls at the 1939-1940 New York World’s Fair. They found space in the left wing of the Japanese Pavilion (“patterned generally after the Grand Shrine of Ise”). A Diplomatic Room presented a predictable, if curious, panoramic history of U.S.-Japan relations, including images of the 1854 Treaty of Amity, the 1871 American arrival of the Iwakura Mission, and the 1905 signing of the Portsmouth Treaty.⁷⁵² At the center of the room was an exhibit commissioned by Mikimoto in Osaka: a one-third scale silver model of Philadelphia’s Liberty Bell, covered in nearly twelve thousand pearls and complete with the original bell’s inscription of “Proclaim Liberty Throughout All the Land, Unto All the Inhabitants Thereof” rendered with 360 diamonds.⁷⁵³ Mikimoto claimed that it was worth one million

⁷⁵¹ *The Sydney Morning Herald*, 24 September 1938.

⁷⁵² *Directory and Catalogue of Exhibits at the Japanese Pavilion and Japanese Section of the Hall of Nations* (Japanese Commission to the New York World’s Fair, 1939), 41-42.

⁷⁵³ “Japan’s Peace Bell,” *South China Morning Post*, 7 February 1939.

dollars. As Mikimoto employee Katō Toranosuke later explained it, Mikimoto had sought to recreate the bell ever since his first visit to Philadelphia over a decade before.⁷⁵⁴

Up through the mid-1930s Mikimoto's increasingly visible American branches appeared to be bringing results. "Each succeeding year since 1927 has shown a mounting increase of sales...a situation that has run parallel with growing confidence in Mikimoto Cultivated Pearls as distinctive and highly desirable jewelry," boasted one of the company's 1936 advertisements in *The Jewelers' Circular*.⁷⁵⁵ One way to interpret this statement is that Mikimoto's employees saw new opportunities to sell pearls in the United States well after the Wall Street crash or Manchurian Incident. Crisis did not make an appearance in the company's public summaries of its decade-long American operations. But rising sales obscured more complicated changes that transformed Mikimoto's cultivation and sales networks between the late 1920s and the early 1930s.

In Japan, Mikimoto's presence at the New York World's Fair was part of new justifications of pearl cultivation's place in Japan amid visions of autarky, the looming threat of economic sanction, and the "current (emergency) situation" (*jikyoku*) of war in China. "The current emergency and pearls—at first glance these two topics give the impression of being completely unrelated," read a 1939 article describing pearl cultivation (and Mikimoto's Liberty Bell) in the journal *Keizai magajin*. "However, if we shift our gaze to look at their place in overseas trade, we can see how pearls play an important role in capturing foreign currency. Pearls act as a vanguard in the battle for international

⁷⁵⁴ Katō Toranosuke, *Mikimoto shujin to watashi to no kankei*.

⁷⁵⁵ *The Jewelers' Circular* v. 106 no. 4 (1936), p. 46.

markets, contributing to the progress of our homeland Japan.”⁷⁵⁶ In other words, pearls and war might make for strange bedfellows, but pearls cultivated in Japan could be exchanged overseas for currency, which could then support Japan’s war effort. Pearls were a lifeline precisely because they could still bring in money from overseas. Yet the intractable problem with such lofty wartime rhetoric was that the “battle for international markets” was not simply a matter of Mikimoto’s “Japanese” pearls venturing forth into hostile economic territory.

Seo’s goal upon arrival in Manhattan had been to bring modest shipments of Mikimoto pearls to “first class” dealers and, in turn, to “first class” customers. By the 1930s, however, the language of distinction had shifted. Distinction referred not to an elite tranche of society but rather to an elite tranche of cultured pearl—a “Mikimoto Cultivated Pearl”—which could satisfy the desires of many. The depression-era meeting of distinction (among competing varieties of cultured pearls) and desire (among female consumers who hoped to purchase them for adornment) came about through Mikimoto’s expanded saltwater cultivation in Gokasho and the sorting and drilling of spherical pearls into exportable strands in Toba. It was a combination that remained even after Mikimoto’s subsequent farm closures and his new policy of buying up as many “first class” pearls as other cultivators could bring him.

The problem for Mikimoto was that strings of pearls arrived in New York, unscathed but for a ten percent customs levy, from a growing array of cultivators and

⁷⁵⁶ “Gaika kakutoku ni kōken suru yōshoku shinjuō,” *Keizai magajin* n. 8 (1939).

dealers. Mikimoto and his employees feared competing sources of cultured pearls in Japan and in the United States, not natural pearls *per se*. As one of those competitors, James Leys of Leys, Christie & Co., put it, “There’s no real war between Natural and *good* Cultured Pearls.” Leys elaborated on this point in a letter that was published as a half-page advertisement:

Consider—without good Cultured Pearls you would have nothing to span the gap between Natural Pearls and imitations—in fact, unless there were Cultured Pearls there just *wouldn't be any appreciable pearl business* in the great middle-class market, where the greatest sales volume lies. Every jeweler gains from the sale of *good* Cultured Pearls, but only from *good* ones.⁷⁵⁷

For both Mikimoto and Leys, the battle to claim the mantle of a “good” cultured pearl was ongoing. It produced a hierarchy of imitations and “bad” cultured pearls above which their own products could lie. All pearl imports declined after 1929, but by the mid-1930s consumers in the United States appeared to be turning to inexpensive cultured pearl necklaces. The battle for adornment was being fought on the basis of current low prices, not on the promise of future profits. In so doing, cultured pearl purveyors defined their prize as a middle class of consumers searching for a middle class of pearl.

Mikimoto’s pearl Liberty Bell took center stage in the company’s American print advertising 1939, including the company’s first national campaign in *Vogue* magazine.⁷⁵⁸ By this time, however, Mikimoto’s techniques of publicity had new competition as well. The Chicago-based Imperial Pearl Syndicate, for one, had produced its own cultured pearl-studded model of the pyramidal Trylon and round Perisphere, the structures that

⁷⁵⁷ *The Jewelers’ Circular* (September 1939), p. 87, emphasis in the original.

⁷⁵⁸ *Vogue* v. 93 n. 9 (May 1939), p. 138.

housed what the New York fair organizers billed as the “World of Tomorrow.” The Syndicate publicly estimated its value at two million dollars, twice that of Mikimoto’s Liberty Bell.⁷⁵⁹ The real war was not between natural pearls and *good* cultured pearls, or between Japanese pearls and American markets. Among dealers in cultured pearls, the war was rather to define the *best* cultured pearl—and put themselves in a position to sell it to department stores and retail jewelers across the country. It was a conflict that would continue to shape pearl sales after 1941.

Post-Pearl Harbor

Beyond a vague readiness to associate it with cherry blossoms, fans, Fuji, buck teeth, earthquakes, ancestor worship, silkworms, cultured pearls, and a peculiarly arduous form of suicide, most U.S. citizens knew very little about Japan before Dec. 7, 1941.⁷⁶⁰

The Pacific War appears as a strange hiatus in accounts of pearl cultivation. With Japan’s attack on Hawaii’s Pearl Harbor, direct trade in Allied countries ceased to be an option. Mikimoto’s remaining overseas salesmen soon returned, along with other Japanese nationals, to the metropole. The factory shut down after 1941, when the sale of jewelry in Japan, including cultured pearls, was banned. Mikimoto handed Pearl Island over to the Japanese Navy.⁷⁶¹ But pearl oyster cultivation along Japanese coastlines continued, if only for ostensibly pharmaceutical purposes. Readers in Japan began to see slogans like “pearls

⁷⁵⁹ *The Jewelers’ Circular* (August 1939).

⁷⁶⁰ Ernest O. Hauser, “Tojo: The Japanese Prime Minister who is running a war against the U.S. is a tough crafty samurai general,” *Life* (30 March 1942), p. 69.

⁷⁶¹ *Mikimoto shinju hatsumeï 100 nenshi*.

can turn into medicine” (*shinju wa kusuri ni naru*), a catchphrase that might have described some of Mikimoto’s earliest dealings with Chinese treaty port merchants during the Meiji years.⁷⁶² Mikimoto quickly seized upon a new commodity form with which to market ground-up pearls and pearl shell to Japanese sailors: “Pearl calc” calcium supplements.⁷⁶³

“Japanese pearl oysters are on strike,” wrote one American cultured pearl purveyor in a 1942 advertisement.⁷⁶⁴ With cultured pearls scarce, prices for all pearls rose significantly for the first time since in the 1920s.⁷⁶⁵ Amid strong wartime jewelry sales in the United States, dealers in New York continued to sell their remaining stocks of cultured pearls. Mikimoto took advantage of the wartime pearl crunch as well: Katō Toranosuke and several other company employees moved between Tokyo and Japanese-occupied Shanghai, where they supplied local “British jewelry shops.”⁷⁶⁶

In 1946, American-led Occupation authorities licensed six pearl cultivators, including Mikimoto’s company, to resume shellfish raising for purchase by the Supreme Commander for the Allied Powers.⁷⁶⁷ In Mie prefecture, the exclusive claims that

⁷⁶² *Chūbu Nihon daikan* (Nagoya Shinbunsha, 1941).

⁷⁶³ “Pearls for Everyone,” *Time* v. 48 n. 11 (9 September 1946). Medicinal preparations appear to have been sent to Shanghai as well.

⁷⁶⁴ “Made to Order by the Oyster,” *Vogue* v. 100 n. 11 (1 December 1942), p. 101.

⁷⁶⁵ As René Bloch put it in October 1944 in New York, “In fact the price of pearls had fallen to a level representing less than 10% of that which obtained in 1928-1929. Prices have risen noticeably since last year and have reached now, according to quality, 15 to 20% of the old prices.” *Records of the Persian Gulf Fisheries 1857-1962*, v. 3 1930-1962 (Cambridge University Press, 1995), p. 630.

⁷⁶⁶ Katō Toranosuke, *Mikimoto shujin to watashi to no kankei*.

⁷⁶⁷ “GIs ‘Pearl King’s Best Customers,” *The Washington Post*, 2 March 1947; “Pearls for Everyone,” *Time* v. 48 n. 11 (9 September 1946).

crisscrossed coastal waters were redrawn against a new regional grouping when, in early 1946, lands from Ise shrine down to Ago Bay in Shima became Japan's first postwar national park. American military officers took up residence in Pearl Island in order to direct a burgeoning number of vacationing soldiers. Nearly all of their tours included a stop in Toba.⁷⁶⁸ Mikimoto hired back a number of the *ama* divers who, as Occupation officials put it, had been on "holiday" (presumably alongside "striking" pearl oysters) during the previous four years of unprecedented warfare.⁷⁶⁹

Pearls circulated as objects of barter in the early months of the Occupation. Necklaces were among the items that *Life* magazine showed according to one of the post-1945 black market's currencies, American cigarettes.⁷⁷⁰ A few months after the resumption of private pearl trading in August 1948, an article on Mikimoto and his company appeared in the January 1949 issue of *Reader's Digest*.⁷⁷¹ In the months that followed the article, letters from women in small towns across the United States began to flood into Mie prefecture. Elinore Jones of Gary Indiana wrote to ask for a strand of pearls and a pair of earrings. "Please let me know the price of them, or I can send some kind of merchandise in exchange for them," she added.⁷⁷² Marian Keim of Grayland, Washington

⁷⁶⁸ "Visitors Welcomed on Pearl Farm Tour," *Stars & Stripes*, 28 September 1949.

⁷⁶⁹ "Japanese Pearl Divers Resume Trade after Four Year Holiday," U.S. Army Forces in the Pacific (AFPAC) press release, 11 September 1946, E. O. 12065 Section 3-402 NNDG. No. 775015, Occupation Records, accessed from copies held in Japan's National Diet Library.

⁷⁷⁰ Noel F. Bush, "A Report on Japan," *Life* (2 December 1946), p. 115.

⁷⁷¹ Blake Clark and Deena Clark, "Kokichi Mikimoto: The Pearl King," *Reader's Digest* (January 1949).

⁷⁷² Elinore Jones to Mikimoto Kōkichi, 30 December 1949, held in MPIMA.

requested a strand of “15 to 25 dollars.” She addressed her envelope to “Honorable Kokichi Mikimoto, Pearl King of the World, Island of Tatoku, Japan.”⁷⁷³ It arrived without any evident problem.

Yet with the end of occupation, the Pearl King of the World was just one among an enlarged and emboldened number of pearl cultivators. Land redistribution was paralleled by dramatic restructuring of Japan’s fisheries law under Occupation auspices. Village fishing associations gained more direct control over coastal fisheries. Mikimoto’s 41,000 acre “colony” was not thinkable in the new order. Even so, the new fisheries law emphasized continuity over revolution in pearl cultivation. It included a unique provision stating that preference for demarcated pearl fishery rights would be given to applicants who had “prior experience” with cultivation.⁷⁷⁴ Cultivators made new contacts with dealers—then based overwhelmingly in Kobe and New York rather than Bombay, Paris, or London—who were at the center of plans to further shape Japan’s post-imperial coastlines toward American (and, soon enough, European) jewelry markets.⁷⁷⁵

Several developments, in turn, decimated natural pearl networks. The Persian Gulf saw the continued growth of oil exploitation and the decline of pearl boat ownership. This was closely connected to the wartime decline of Paris as a pearl entrêpot and the subsequent post-independence and post-Partition decline of Bombay’s pearl market,

⁷⁷³ Marian M. Keim to Mikimoto Kōkichi, 7 January 1949, held in MPIMA.

⁷⁷⁴ See, for example, Makino Yoshirō, *Shima no gyoson* (Tokyo: Meicho shuppan, 1994), p. 295.

⁷⁷⁵ The Mikimoto Pearl Island Museum Archives (MPIMA) contains a number of letters from importers in Delhi, Pondicherry, and Bombay who hoped to establish trading relationships with Mikimoto after 1949, but it appears that nothing came of these inquiries.

particularly when the newly constituted Indian government banned all pearl imports—and, as a result, halted the activities of a large Muslim contingent of pearl traders. Among the growing ranks of New York dealers were French Jewish emigrés. Many had dealt in natural pearls in Paris before leaving France after the Nazi German invasion. Foremost among them was Léonard Rosenthal, who had once been at the center of the Paris pearl trials. A chapter of his postwar autobiography, entitled “My former enemy No. 1,” reflected his own commercial transformation into a dealer in cultured pearls on Fifth Avenue.⁷⁷⁶ With Rosenthal in New York was his 1920s antagonist, Lucien Pohl. Pohl remained in contact with Mikimoto while working first as a French-language host of a science program on the Voice of America radio network and, later, as an active member of the New York Entomological Society.⁷⁷⁷ Others, like Jacques Bienenfeld and René Bloch, who had commercialized the Perrin-Chilowsky pearl testing endoscope, continued to agitate on Fifth Avenue for restrictions on pearl cultivation and cultured pearls during the war years.⁷⁷⁸

Along with the revived trade in cultured pearls came the revival and extension of pre-export inspections in Japan, first under Occupation auspices but later under the 1952 standards that underlay the formation of the first national export pearl inspection laboratories in Kobe and Tokyo.⁷⁷⁹ Inspections took on an explicitly national character,

⁷⁷⁶ See the chapter “Mon Ancien Ennemi No. 1,” in Léonard Rosenthal, *Mémoires d'un chercheur des perles* (Paris: Deux Rives, 1949), pp. 139-145.

⁷⁷⁷ Personal communication with Professor Eugene Lyons, Lucien Pohl's son-in-law.

⁷⁷⁸ Records of the Persian Gulf Fisheries 1857-1962, pp. 630-631.

⁷⁷⁹ Tange Makoto, “Shinju sangyō ni okeru hinshitsu kisei,” *Kikan shinju bijinesu* no. 1 (April 1989).

moreover, just as cultivation techniques—along with pearl technicians—began to move from the coastlines of post-imperial Japan and American-governed Okinawa to Australia and elsewhere in the Pacific.⁷⁸⁰

The question of a pearl's naturalness took on a different tenor overseas in a situation where the overwhelming majority of all shellfish-derived pearls were "cultured." But well into the 1950s it remained a matter of concern at Tiffany & Co., which hired the former Pearl Associates' researcher A. E. Alexander to oversee its testing facility. "Tiffany's laboratory, which was opened in 1925, and was the first in the trade in America, X-rays every pearl the firm buys to make sure no cultured article infiltrates the inventory," noted a 1953 feature article in *The Saturday Evening Post*. "It also examines every pearl of more than a grain, with an optical instrument called an endoscope. This permits microscopic inspection of the pearl through the drill hole. A record of the hundreds of thousands of pearls the firm has sold or has had in stock since its introduction is on file. Buy a pearl necklace at Tiffany's and you get its family album too."⁷⁸¹ Tiffany & Co. only began to carry cultured pearls—housed at first in a display case that was physically separated from the natural pearl jewelry—not long after the 1955 opening of a new New York City Mikimoto store, just across the street from its own Fifth Avenue flagship.⁷⁸²

⁷⁸⁰ This is a subject of my current research.

⁷⁸¹ Henry LaCossitt, "Treasure House on Fifth Avenue," *The Saturday Evening Post* (24 January 1953), pp. 103-104.

⁷⁸² "Tiffany's Has Stock of Cultured Pearls," *The New York Times*, 30 April 1959. Tiffany & Co. moved to a new location at 57th Street and Fifth Avenue in 1940.

The limits of the Mikimoto pearl changed too, as other branded cultured pearls multiplied inside and outside Japan. The company re-appropriated (or rather, continued to re-appropriate) the language and practices of exclusivity employed by the same pearl purveyors who had once opposed the broader project of Japanese pearl cultivation. This stance was apparent even in the company's retooled 1960s-era Japanese advertising, which presented a "Mikimoto of the East" as a counterpart to a "Tiffany of the West."⁷⁸³ The slogan invoked luxury that was comparable, even as it simultaneously existed inside culturally and geographically distinct spheres. But on multiple counts the slogan belied the intertwined and conflict-riddled pasts of the two companies, as well as the distinctions between pearls, people, and markets for which both had tried to stand.

⁷⁸³ *Yomiuri shinbun*, 21 October 1962.

Conclusion

The preceding chapters have examined the origins of pearl cultivation in the Japanese empire in tandem with the rise of machine-mediated gemological pearl testing in Europe. The final chapter has concluded by linking both of these developments with an American consuming public that came to serve in different ways as a prize of natural and cultured pearl purveyors. I will close with four concluding observations.

The first observation has to do with the close but not coterminous relationship between imperial patronage and imperial legal rights. Through his final months Mikimoto stayed in close contact with Emperor Hirohito and Empress Kōjun, the latter of whom made a visit to the Shin Tatoku farm earlier in the spring of 1954.⁷⁸⁴ Mikimoto's role as courtier to a succession of Japanese emperors—Meiji, Taishō, and Showa—cannot be disentangled from his acquisition and exercise of legal rights over oysters and ocean space. Even so, the patents and fisheries rights that were in part enabled by imperial relationships also became targets for anti-Mikimoto cultivators. Imperial friendships may have been off-limits for criticism or adjudication, but “imperial” rights were most

⁷⁸⁴ *Yomiuri shinbun*, 9 April 1954. Mikimoto had also hosted the empress on an extended visit to Toba and Pearl Island in 1937. See *Kōtaigō heika gyōkeiki, Mie ken hen* (Tokyo, 1938).

certainly in play. Foundational legal understandings of monopoly—and its application to living creatures—developed in Japan within this contradictory imperial culture.

A second, related observation is that the early years of pearl cultivation in the Japanese empire cannot be understood without understanding how patents worked during that time. For four decades, from his first patent until the expiration of the second-generation Nishikawa patents over which he gained control, Mikimoto focused on cultivating pearls in his company's waters—and using claims over ocean space to outmaneuver potential competitors. Outside Mikimoto's company, patents supported the organization of cultivation in the form of licensing agreements—even after Mikimoto attempted to refashion those agreements in the late 1920s. Mikimoto claimed to represent pearl oysters and pearls in the Japanese empire as well as overseas, but his career as a big cultivator can be dated according to the issuance and expiration of Japanese patents. Extensive cultivation ceased to be a defining characteristic of Mikimoto's company after the 1930s. Large-scale public displays of the company's owner and brand, however, continued throughout the twentieth century. The mound of shells that once dwarfed Mikimoto Kōkichi did not make a reappearance on Pearl Island in the weeks after Mikimoto's death in September 1954. Visitors arrived instead to gaze upon an even larger monument, a nearly four-meter-tall bronze statue of Mikimoto that had been built the year before.⁷⁸⁵

⁷⁸⁵ *Asahi shinbun*, 31 October 1954. The statue's designer, Kitamura Seibō (1884-1987), would gain even greater notice in 1955 with the unveiling of his bronze Peace Statue (*Heiwa kinen zō*) in Nagasaki.

In 1957, “the 50th anniversary of the cultured pearl”—dated a half century after Mikimoto's competitors Nishikawa Tōkichi and Mise Tatsuhei first submitted spherical pearl patent applications—cultivators across Japan, including attendees from Mikimoto's company, gathered together to celebrate a Pearl Festival (*Shinju matsuri*) under the auspices of the Japan Pearl Promotion Society (*Nihon shinju shinkōkai*).⁷⁸⁶ The first Pearl Festival (for it is an event now held on a yearly basis) included the hiring of a ship to “return pearls to the sea,” a ceremonial dumping in line with Mikimoto's earlier efforts to dispose of substandard pearls by burning them or burying them underground.⁷⁸⁷ The 1957 festival did not highlight Mikimoto's special relationship with pearl oysters. Instead, it publicly commemorated pearl cultivation as a national industry, albeit one with a host of competing cultivators. It also signaled a truce over the tangled web of priority claims to patents that, in any event, no longer structured cultivators' livelihoods as in the past. Mikimoto, Mise, and Nishikawa together received credit for the invention of spherical pearl cultivation.⁷⁸⁸

The third observation relates to the distinction between big farming and commercial export farming at other scales. Earlier in the century observers remarked on the vastness of Mikimoto's saltwater holdings (and those of some of his competitors). But

⁷⁸⁶ An advertisement for the festival, held from October 1st to the 6th, can be found in the *Yomiuri shinbun*, 26 September 1957.

⁷⁸⁷ Mikimoto's 1936 *kuyō* ceremony had ended with a similar watery burial—not of pearls, but of a million-and-a-half pearl oyster shells.

⁷⁸⁸ This compromise, in turn, sparked efforts to determine, once and for all, the authorship of spherical pearl techniques. See in particular Kuru, Tarō, *Shinju no hatsumeisha wa dare ka?: Nishikawa Tōkichi to Tōdai purojekuto* (Tokyo: Keisō shobō, 1987).

size was itself an artifact of patent rights ownership and of being first on the scene to make deals with local village leaders. Exclusive fisheries rights kept other cultivators away from specific plots of saltwater; patents allowed for the possibility of legal action wherever else they might try to set up shop. Without patents—or, at least, without broadly worded first and second generation patents—a pattern of buyer control and research organized along national lines grew in prominence after 1945.⁷⁸⁹ Nevertheless, a quest to control supplies of living pearl oysters continued to redraw Japanese coastal geography after World War II. Distinctions between cultivated and uncultivated ocean space shaped livelihoods everywhere pearl oysters could be found, as in Ago Bay, and everywhere those shellfish could be moved, as in neighboring Gokasho Bay. By the 1950s and 1960s, when floating pearl oyster rafts began to blanket the surface of Ago Bay with greater density than before the war, cultivators in Mie Prefecture looked to the Seto Inland Sea and elsewhere in postwar Japan for coastal farming waters that could be leased from newly reorganized postwar fishing cooperative associations. Some of the Japanese social scientists who came in sizeable numbers to study the local impacts of pearl cultivation looked at newer changes with critical eyes. “Pearl cultivation is not something that results from the environmental evaluations of local fishers themselves,” wrote

⁷⁸⁹ Post World War II pearl cultivation, in other words, came to resemble in some respects the national organization of Japanese sericultural research (both before and after the 1930s silk crash). At the same time, however, corporate patenting and a culture of secrecy both persisted along the lines of fermentation research. See Tessa Morris-Suzuki, “Sericulture and the Origins of Japanese Industrialization,” *Technology and Culture* v. 33 n. 1 (January 1992), pp. 101-121; Lisa Onaga, “Toyama Kametaro and Vernon Kellogg: Silkworm Inheritance Experiments in Japan, Siam, and the United States, 1900-1912,” *Journal of the History of Biology* v. 43 n. 2 (2010), pp. 215 - 264; Victoria Lee, “The Arts of the Microbial World: Biosynthetic Technologies in Twentieth-Century Japan” (PhD diss., Princeton, 2014).

geographer Oguri Hiroshi in a 1965 study. “It deeply resembles the ‘plantation’ of tropical colonies. The capital and technology are from Mie, while the labor of day-to-day management alone is supplied locally. The pearls thus produced are not meant for the consumption or profit of local residents; the main distribution routes have taken the form of passing through Mie operators.” Oguri’s new observation was that non-Mie local investors had appeared on the scene as well, “a point that also resembles the development pattern of the tropical ‘plantation.’”⁷⁹⁰ The tropical plantation metaphor of postwar pearl cultivation was in conversation with the studies of plantation production that were appearing around that time in post-World War II Japan. Yet it was also an understanding of the potential for capital-intensive export farming to transform landscapes in ways that could appear alien, especially when compared to received impressions of modern Japanese landed agriculture.⁷⁹¹

The fourth and final observation is the shifting but persistent problem of dealing with pearl cultivation at the level of pearls. Through the 1930s, frameworks for regulating and defining cultured pearls in Europe followed on the heels of cultivation practices in the Japanese empire. Today, new boundary lines have emerged, with freshwater cultured pearls (many now coming from longstanding regions of “Buddha shell” and semispherical pearl culture in southern China) juxtaposed against saltwater cultured pearls, which in

⁷⁹⁰ Oguri Hiroshi, “Mie ken o nozoku engan chiiki ni okeru shinju yōshoku no tenkai (gaihō),” *Chirigaku hyōron* v. 38 n. 5 (1965), pp. 22–23. The two instances of “plantation” stand out further because they alone are rendered in the Roman alphabet.

⁷⁹¹ See, for example, David Harvey, *Spaces of Capital: Towards a Critical Geography* (New York: Taylor and Francis, 2001).

turn can be broken down into categories that include “South Seas” pearls from Australia and Tahiti or “akoyagais” from Japan. Debates center on variations of cultivation, rather than nature-vs.-culture as such. Recently, the European B.I.B.O.A. jeweler association’s new incarnation, known since 1961 as C.I.B.J.O.—a Rome-based organization “with a global rather than a continental focus”—has grappled with the problem of pearl nomenclature afresh in an era of cultivation.⁷⁹² C.I.B.J.O. took notice when some dealers came out in favor of referring to cultured pearls without mentioning “culture” at all. The dealer position was clear: hadn’t cultured pearls, which now compose the overwhelming majority of all necklaces, cosmetics, and medicinal powders now for sale, acquired the everyday connotation of a “pearl”?⁷⁹³ In response, a new proposal emerged from a 2010 meeting in Bahrain, once the center of the trade in “oriental” pearls. C.I.B.J.O. rewrote its labeling guidelines; it now recommends that all pearls be called either “natural,” “cultured,” or “imitation,” rather than the previous possibility of a “pearl” that was understood to be natural. Under this rubric a simple “pearl” does not exist, precisely because the non-cultivated character of any pearl cannot be taken for granted.⁷⁹⁴

⁷⁹² Accessed from the C.I.B.J.O. website, <http://www.cibjo.org/>, 22 July 2015.

⁷⁹³ Accessed from the C.I.B.J.O. website, http://www.cibjo.org/index.php?option=com_content&view=article&id=265&Itemid=223, 22 July 2015.

⁷⁹⁴ As C.I.B.J.O.’s nomenclature guide puts it, “The jewellery industry recognizes four categories of pearl: Natural pearls (5.126), cultured pearls (5.51), composite cultured pearls (5.45) and imitation pearls (5.91).” “Composite pearls” include pearls formed from two semi-spherical “blister pearls” that are bonded together. C.I.B.J.O. Pearl Commission, *The Pearl Book* (C.I.B.J.O., 2014), p. 2.

A nature-vs.-culture dualism emerged to classify the products of cultivation, but cultivation itself has functioned as a middle category. Cultivation resulted in objects that made existing divisions between oriental or fine pearls and imitations seem trivial by comparison. The culture that defined those objects fit somewhere in between ideas of pure nature and pure human artifice. Culture was not nature, but neither was it nature's opposite. Nor was culture the same middle category everywhere. For Mikimoto, cultivation held the promise of an exclusive alliance with nature and the Japanese empire. To cultivate pearls was to exist above living creatures as their king and alongside them as their helper. Cultivation, however, did not and does not readily stay in place, on paper or in the water.

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Archives

Abbreviation

Archives de Paris (Paris France)	AP
Archives du Monde du Travail (Lille, France)	AMT
Bibliothèque de malacologie, Muséum national d'histoire naturelle (Paris, France)	MNHN
Gemological Institute of America Library (Carlsbad, California)	GIA
Japan Center for Asian Historical Records (Tokyo, Japan; jacar.go.jp)	JACAR
Library of Congress Archives (Washington, D.C.)	LOC
London Metropolitan Archives (London, England)	LMA
Lucien Pohl Papers (in author's possession)	LP
Mie Prefecture Historical Archives (Kenshi hensan-ban, Tsu, Mie, Japan)	MHA
Mikimoto Pearl Island Museum Archives (Toba, Mie, Japan)	MPIMA
Mitsubishi company archives (Mitsubishi shiryōkan, Tokyo, Japan)	MS
National Archives of Australia (Canberra, Australia)	NAA
Natural History Museum Vienna (Vienna, Austria)	NHNV
The Royal Institute (London, England)	RI
United States National Archives (College Park, MD)	USNA

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Deutsche Goldschmiede-Zeitung

Published in India

The Times of India

Published in Japan

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Dai Nihon suisankai hōkoku

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