

THE GREAT CONVERGENCE:  
Japan's Discovery of the Natural Environment

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This article explores the Japanese discovery of nature by building linkages between the discovery of the natural environment and national development, particularly in the early modern world. Generally, those nations that engineered nature to suit their economic needs, rather than flexed to suit nature's demands, rose to global dominance. Certainly, this is what European scholars, starting with Max Weber (1864-1920), argued was pivotal to Western Europe's ascendancy after the discovery of the New World.

Bending nature to suit economic needs is not exclusive to Western Europe, however, as is often assumed by Eurocentric scholars. Importantly, there are common historical attributes, patterns, and structures shared by Japan and Western Europe, ones that help place the Japanese discovery of the natural environment in global context and explain Japan's "miraculous" twentieth-century emergence as a global economic and military force.<sup>1</sup> By turning to deep history, we can identify shared elements of the human discovery of the natural environment, ones based in our evolutionary past, rather than overemphasize cultural differences. This analysis suggests that Japan's ascendancy in the late nineteenth and early twentieth centuries was not the result of historical happenstance, national distinctiveness, or superior mimicry skills, as is often submitted. Rather, it resulted from historical experiences that created structures similar to Western Europe and that provided Japanese with the tools, both intellectual and otherwise, to manipulating nature for national strengthening projects and economic vitality. In Japan, the discovery of

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<sup>1</sup> Though many Western scholars use the word "miraculous" to describe Japan's modernization in the nineteenth century, Japanese officials themselves also characterized the Meiji project as a "heavenly miracle, almost beyond human capability." See Kume Kunitake, comp. *The Iwakura Embassy 1871-73: A True Account of the Ambassador Extraordinary & Plenipotentiary's Journey of Observation Through the United States of America and Europe*, Vol. 1, trans. Martin Collcutt (Matsudo: The Japan Documents, 2002), 4.

nature occurred primarily in the arenas of natural aesthetics, labor and engineering, as well as the medical and natural sciences.

To identify some of these common historical structures, and project Japan's discovery of nature through a new lens, we first turn to debates over the role of nature in the "European miracle" and what made Western Europe historically exceptional, turning from a global backwater in the fifteenth century to master of the planet in the nineteenth. Historians may disagree on the legacies of European domination and empire, but its existence is irrefutable.

### *The Distraction of Eurocentrism*

Historians have created a veritable cottage industry seeking to explain the ascendancy of Western Europe in the early modern period.<sup>2</sup> Recently, Niall Ferguson has distilled what "distinguished the West from the rest" to what he calls the "killer apps" (the applications of iPod fame), which include the institutional assemblages of competition, science, property rights, medicine, the consumer society, and the work ethic.<sup>3</sup> He argues that these assemblages birthed Western power.

With nineteenth-century imperialism, these assemblages were then transported from one country to another and often used by technocrats for national modernization projects. Japan's Meiji period (1868-1912) was one such modernizing moment, when envoys, on such occasions as the Iwakura Mission (1871), went on shopping sprees in the marketplace of Western ideas and institutions. In these instances, however, the operating systems of the adopting country, its institutional mainframe (to continue with Ferguson's computer analogy), needed to be compatible for successful downloading to occur. In Japan, the mainframe proved uniquely compatible and the small Asian country transformed from an "impenetrable" place, in Herman Melville's words, to an industrial and military powerhouse a century later.<sup>4</sup>

Indeed, the lesson that stands out with the globetrotting Iwakura Mission is the easy transferability of science and industry between Japan and Western Europe. Kume Kunitake (1839-1931), compiler of Mission's final report, recognized that, "There are great differences in technology between the East and West." But he also recognized the mutual compatibility of ideas and institutions. He reflected, "Yet what people are so secretive about in the West is often customary practice in the East. There are also cases in the East where custom has led to new inventions and

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<sup>2</sup> See J. M. Blaut, *The Colonizer's Model of the World: Geographical Diffusionism and Eurocentric History* (New York and London: The Guilford Press, 1993), 1-151.

<sup>3</sup> Niall Ferguson, *Civilization: The West and the Rest* (New York: The Penguin Press, 2011), 12-13.

<sup>4</sup> Herman Melville, *Moby Dick, or The White Whale* (Boston: L. C. Page and Company, 1950), 479.

improvements.”<sup>5</sup> Sharing between the cultural realms was possible because they were mutually compatible. Often, raw human similarities between Japan and Western Europe outweighed the obvious cultural differences.

In his enthusiasm to celebrate what Eric Jones has called the “European miracle,” Ferguson glosses the intriguing fact that some non-European countries proved far better at downloading the Western institutional package than others.<sup>6</sup> As Pankaj Mishra has recently argued, some Asian intellectuals, in the aftermath of the decay of European empires, even improved on it. But Mishra’s explanation for Japan’s early success is intellectually unsatisfying and historically shaky. “Long sequestered,” Mishra writes, “the Japanese were able to borrow the tool-kit of modernity earlier and more comprehensively than any other Asian country.” This, the reader is assured, explains Japan’s ascendancy in the late nineteenth and early twentieth centuries. Again, we learn that the Japanese are superior at mimicry, and that they learned this invaluable skill, remarkably, through two and a half centuries of supposed national isolation (*sakoku*) during the early modern period. Mishra never explains how secluded Japan, which only traded with the Dutch and its Asian partners between 1640 and 1853, acquired the Western “tool-kit” earlier than countries that had been open to the West, for better or worse, for centuries.<sup>7</sup>

In Japan’s case, the reason is not because the country is a master imitator, well practiced after a millennium of copying China and, to a lesser degree, Europe, under its belt. Rather, Japan proved better because it underwent historical development remarkably similar to Europe. There was something familiar about Western modernity, even though Japan had received relatively little European diffusion in the medieval and early modern years.<sup>8</sup> And herein lies the second problem with Mishra’s explanation. By arguing that such prominent Asian intellectuals as Jamal al-Din al-Afghani (1838-97) challenged Western empires through their engagement and utilization of Western modernity – essentially, a diffusion argument – the debate about whether such modernity was indeed a monopoly of Western Europe, an inherent part of a superior Western culture, is never adequately engaged. Deep history offers a more human vantage point by suggesting that modernity was not a monopoly of the Western experience because

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<sup>5</sup> *The Iwakura Mission*, 9.

<sup>6</sup> Eric Jones, *The European Miracle: Environments, Economies, and Geopolitics in the History of Europe and Asia* (Cambridge: Cambridge University Press, 1981).

<sup>7</sup> Pankaj Mishra, *From the Ruins of Empire: The Intellectuals Who Remade Asia* (Farrar, Straus and Giroux, 2012), 44. See Mishra’s review of Ferguson in Pankaj Mishra, “Watch this Man,” *London Review of Books* 33, no. 21 (3 November 2011): 10-12.

<sup>8</sup> Maritime prohibitions (*kaikin*) protected Japan from the bulk of European influence, Ronald P. Toby, *State and Diplomacy in Early Modern Japan: Asia in the Development of the Tokugawa Bakufu* (Princeton: Princeton University Press, 1984; Reprint, Stanford: Stanford University Press, 1991).

Japan developed a similarly modern “tool-kit,” an assertion that challenges the core of the Eurocentric perspective.

The focus on transcultural convergences makes Ferguson’s “killer apps” not necessarily Western European because Japan developed many of them indigenously or borrowed them from China and Korea (just as Western Europe borrowed many of its from elsewhere). Japan and Western Europe developed more or less independently on separate sides of Earth, but landed on strikingly similar ways of interacting with the natural environment. It is hard to view these similar patterns as the coincidental result of the development of separate cultures. It is more likely that they are the historical product of life’s relentless predisposition to move toward certain arrangements, ones emergent within the confines of our shared evolutionary experiences as *Homo sapiens* and, over generations, reflected through the lens of separate cultural communities. It is not by historical fluke or geographic happenstance that Japan challenged the West during the Pacific War (1937-45) and, later, found a seat at the otherwise Western G7 table. There are reasons rooted in deep history for Japan’s ascendancy, as well as in the patterns of Japan’s interaction with natural environment.

One byproduct of a deep historical analysis of Japan and Western Europe is to build a new logic for common human structures, rather than continually fortify the logic of intractable, insurmountable ethnic and cultural difference. With the cultural turn, identifying universal, structural patterns in human perception, behavior, and organization became increasingly mired in the spiraling, kaleidoscopic ponderings of cultural and moral relativism. As Bryan D. Palmer has described, the cultural turn signaled a “hedonistic descent into a plurality of discourses that decenter the world in a chaotic denial of any acknowledgement of tangible structures of power and comprehensions of meaning.”<sup>9</sup> By contrast, deep history provides an opportunity to build new human structures from the rubble of the excesses of the cultural turn and the self-absorbed abyss of identity politics. Surely, one critique of deep history will be that it relies on biological sciences, a discipline that is underwritten by patriarchal, capitalist power. As Donna Haraway has argued, biology is often mobilized to reinforce Western dominance hierarchies.<sup>10</sup> As I intend to demonstrate, however, we need not rely on biology because historical evidence makes the case for human commonality as well.

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<sup>9</sup> Bryan D. Palmer, *Descent into Discourse: The Reification of Language and the Writing of Social History* (Philadelphia: Temple University Press, 1990), 188. For a balanced assessment of the linguistic turn, see Geoff Eley, *A Crooked Line: From Cultural History to the History of Society* (Ann Arbor: University of Michigan Press, 2005), 115-181, particularly 187.

<sup>10</sup> Donna J. Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature* (New York: Routledge, 1991), 7-20.

### *The Critical 0.016 Percent*

The early modern period (in Japan, approximately 1590-1800) – which, to take the vantage point of deep history, constitutes 0.016 percent of hominoid existence – is the critical moment in history for the discovery of nature and the establishment of global power. It is a tiny portion of hominoid time, but cumulatively important because so much coalesced in terms of the human command of energy supplied to our biosphere by the sun through photosynthesis in flora, called Net Primary Productivity (NPP). Today, the human species controls an enormous proportion of global energy – at least a whopping third of the photosynthetic energy produced on Earth – and, as a major industrial power, Japan plays a significant role in that global equation.<sup>11</sup> It is not surprising that the Japanese consume global energy at a rate that rivals Western countries: Japan's early modern historical trajectory was so similar, particularly when viewed through the lens of their interaction with the environment. Clarence J. Glacken has explained that, during Europe's early modern period and the commensurate age of discovery, "men could realize both their power to change the earth and the value of apparently primeval landscapes as outside laboratories for the pursuit of nature's secrets."<sup>12</sup> As Europeans spread across the globe, their "power to change the Earth" was realized in the incidental and intentional creation of environments that resembled those of the Old World and that facilitated their conquest and the extraction of natural resources from them. Alfred Crosby, in his path-breaking study of European colonialism, identified this process as "ecological imperialism."<sup>13</sup> In this regard, Japan's experience resembled Europe's, but on a far smaller scale.

Daniel Lord Smail has insisted that deep history allows the historian to appreciate such similarities, or "human sameness as well as cultural difference." It is only a result of the manner in which historians structure time, timelines traditionally limited by sacred chronologies and secular national ones, which makes our "sameness" as humans altogether surprising.<sup>14</sup> If we stretch out time to include our earliest human ancestors, universalities of human behavior come into better focus. Smail continued:

Within biology, convergent evolution is a process whereby wholly distinct species independently arrive at the same morphological or physiological solution to a problem or an opportunity presented by their environment. Agriculture was independently invented on

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<sup>11</sup> David Christian, *Maps of Time: An Introduction to Big History* (Berkeley and Los Angeles: University of California Press, 2004), 140-41.

<sup>12</sup> Clarence J. Glacken, *Traces on the Rhodian Shore: Nature and Culture in Western Thought from Ancient Times to the End of the Eighteenth Century* (Berkeley and Los Angeles: University of California Press, 1967), 359.

<sup>13</sup> Alfred W. Crosby, *Ecological Imperialism: The Biological Expansion of Europe, 900-1900* (Cambridge: Cambridge University Press, 2004).

<sup>14</sup> Daniel Lord Smail, *On Deep History and the Brain* (Berkeley and Los Angeles: University of California Press, 2008), 8, 188.

different continents, as were writing, pottery, royal cults, priestly castes, embalming, astronomy, earrings, coinage, and holy virginity. This list could go on for pages. Diffusion cannot explain these convergences.<sup>15</sup>

As Smail has concluded, “We celebrate the diversity of human civilizations, but it is the similarities that are the most startling, the thing that continually reminds us of our common humanity.”<sup>16</sup> Following Smail’s lead, this analysis explores the great convergence between Japan and Western Europe, a reverse spin on the “great divergence” between Europe and China, as hypothesized by Kenneth Pomeranz.<sup>17</sup> The seeds of our historical convergence were planted in our evolutionary past and they sprouted and blossomed in the environments of the early modern experience.

In deep history, *Homo sapiens* can be seen not as individualistic, but rather as a highly social species, one in which group evolutionary success outperformed that of individuals. Imanishi Kinji (1902-1992), an important Japanese evolutionary biologist, anticipated the importance of social evolution a half century ago. In *Seibutsu no sekai* (The world of living things, 1941), he first proposed the existence of the “specia,” or the holistic, socially evolving species-society. He demoted the individual organism in evolution, a hallmark of Darwinism, and elevated the social whole. Imanishi wrote, “members of a species can be understood as being linked by kinship and territorial relations and which share the same life form.” He argued that the individual organism is “nothing more than a constituent of the species” and that society is a “place of shared living” where the “individual reproduces and sustains itself.”<sup>18</sup> Imanishi’s discovery of the social nature of *Homo sapiens* – and all other species, for that matter – is critical to understanding the larger trajectory of human development and our place in broader natural and historical orders. Whereas Darwin had identified in the *Origin of Species* (1859) inherited “individual differences” as of the “highest importance” because they “afford materials for natural selection,” Imanishi had viewed evolution as occurring at the social level through affinities that transcended the individual.<sup>19</sup>

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<sup>15</sup> Smail, *On Deep History and the Brain*, 199.

<sup>16</sup> Smail, *On Deep History and the Brain*, 199.

<sup>17</sup> Kenneth Pomeranz, *The Great Divergence: China, Europe, and the Making of the Modern World Economy* (Princeton: Princeton University Press, 2000).

<sup>18</sup> Imanishi Kinji, *Seibutsu no sekai* (The world of living things) [1941], in *Imanishi Kinji zenshû*, Vol. 1, ed. Noma Shôichi (Tokyo: Kôdansha, 1974), 79, 80, 83. See *A Japanese View of Nature: The World of Living Things* by Kinji Imanishi, trans. Pamela J. Asquith, Heita Kawakatsu, Shusuke Yagi, and Hiroyuki Takasaki. Intro. Pamela J. Asquith (London: RoutledgeCurzon, 2002), 39-41.

<sup>19</sup> Charles Darwin, *The Origin of Species by Means of Natural Selection or the Preservation of Favored Races in the Struggle for Life* (New York: The Modern Library, 1998), 67.

This early social experience laid the groundwork for the epigenetic rules of our species that provide, according to evolutionary biologist Edward O. Wilson, the “biases in the way our senses perceive the world, the symbolic coding by which we represent the world, the options we automatically open to ourselves, and the responses we find easiest and most rewarding to make.”<sup>20</sup> Nations may be “imagined communities,” the tangled constructs of human invention, but their epigenetic biases, their actual boundaries of their possibilities, were neurologically programmed millennia ago.<sup>21</sup> Certainly, as humans we paint our own cultures, but we do so only with the pigments evolution has made available to us. When historians trace the development of states and economic institutions, they are tracing the handy work of a species that has evolved to do so in a certain manner. “People must have a tribe,” explains Wilson of our disposition to create nations. “It gives them a name in addition to their own and social meaning in a chaotic world. It makes the environment less disorienting and dangerous.”<sup>22</sup> Seen in this light, nation building is part of the discovery of the natural environment. The complex form nations take are a product of cultural evolution – hence, their multiple forms – but our tireless desire to build them, and the framework in which we imagine them, is a shared trait of our species. Wilson writes that modern states “appeared autonomously as elaborations of already existing genetic predispositions shared by human populations through common ancestry and dating back to the breakout period some 60,000 years ago.”<sup>23</sup> Given our epigenetic biases, it is surprising that our institutions demonstrate as much variation as they do.

There are similarities between Japanese and Western European state development, possibly driven by epigenetic rules and the discovery of a “disorienting and dangerous” environment. It is instructive that historians comfortably apply such European nomenclature as “feudal” and “early modern” to demarcate Japan’s preindustrial chronologies. Even before Japan found itself in the web of global modernity, it had, according to historians, developed in a fashion similar to Western Europe.<sup>24</sup> In the early modern period, just as scholars credit Europe’s yeoman farmer with proto-capitalism, Japan’s early modern cadastral surveys institutionalized private landholding and facilitated the rise of cash-crop farming and proto-capitalism in the countryside.<sup>25</sup> Competition between small

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<sup>20</sup> Edward O. Wilson, *The Social Conquest of Earth* (New York and London: Liveright Publishing Corporation, A Division of W.W. Norton & Co., 2012), 193.

<sup>21</sup> Benedict R. Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (London: Verso, 1983).

<sup>22</sup> Wilson, *The Social Conquest of Earth*, 57.

<sup>23</sup> Wilson, *The Social Conquest of Earth*, 102-103.

<sup>24</sup> On Japanese and European feudalism, see William Wayne Farris, *Heavenly Warriors: The Evolution of Japan’s Military, 500-1300* (Cambridge: Harvard University Asia Center, 1996).

<sup>25</sup> For a discussion of the literature linking Hideyoshi’s cadastral surveys to private property, see: Philip C. Brown, *Central Authority and Local Autonomy in the Formation of Early Modern Japan* (Stanford: Stanford University Press, 1993), 17.

Western European states fueled innovation and advancement, but so too did competition between domains in Japan. Indeed, Japan was not a unified empire, such as the Ming (1368-1644) and Qing (1644-1911) dynasties in China or the Mughals (1526-1761) on the Indian subcontinent, and internal competition flourished on the archipelago.<sup>26</sup> Europe sought foreign trade for economic development, including the establishment of empires after the voyages of Vasco Da Gama (1460-1524) and Christopher Columbus (1451-1506). Early modern Japan conquered Ezo (Hokkaido, Sakhalin Island, and the Kuril Islands), infecting Ainu with deadly disease, recruiting them into grinding slave labor, and extracting resources ranging from precious metals to dried salmon to fuel indigenous capitalist growth. One part of the conquest of Ezo was surveying the natural environment for medicinal plants (*saiyaku*).<sup>27</sup> To the historian of Western empires, particularly of the sugar plantations and silver mines of the New World, the organizational parallels are striking, though the scale is certainly smaller.<sup>28</sup> These resources fed Japan's indigenous proto-capitalism, which transformed everything from rural lending practices to labor at herring fisheries.<sup>29</sup> Japanese also had their variant of the famous Protestant work ethic, albeit born in the Neo-Confucian tradition.<sup>30</sup> Japan's population stagnation in the eighteenth century, propelled by rational family planning, meant that it, like Europe, avoided a Malthusian meltdown. And finally, cash crop farming, with contractual rather than kinship labor, propelled Japan into the economic modern age.<sup>31</sup>

These similarities – admittedly not perfect ones, but approximate ones – suggest shared tendencies, or epigenetic rules, in creating institutional assemblages of power, whether political or economic. In her survey of Japanese economic

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Brown has also shown more recently, however, that variation existed from the privatization of property in the form of jointly owned property, called *warichi*. See Philip C. Brown, *Cultivating Commons: Joint Ownership of Arable Land in Early Modern Japan* (Honolulu: University of Hawai'i Press, 2011).

<sup>26</sup> Edward B. Barbier, *Scarcity and Frontiers: How Economies Have Developed through Natural Resource Exploitation* (Cambridge: Cambridge University Press, 2011), 202-203.

<sup>27</sup> David L. Howell, *Capitalism From Within: Economy, Society, and the State in a Japanese Fishery* (Berkeley: University of California Press, 1995). Brett L. Walker, *The Conquest of Ainu Lands: Ecology and Culture in Japanese Expansion, 1590-1800* (Berkeley and Los Angeles: University of California Press, 2001).

<sup>28</sup> John F. Richards, *The Unending Frontier: An Environmental History of the Early Modern World* (Berkeley and Los Angeles: University of California Press, 2003), 309-460.

<sup>29</sup> Saitô Osamu, *Puroto kôgyôka no jidai: Seiô to Nihon no hikakushi* (Tokyo: Hyôronsha, 1985) and Howell, *Capitalism From Within*.

<sup>30</sup> Robert Bellah, *Tokugawa Religion: The Cultural Roots of Modern Japan* (New York: Free Press, 1985).

<sup>31</sup> Thomas C. Smith, *The Agrarian Origins of Modern Japan* (Stanford: Stanford University Press, 1959).



thought, for example, Tessa Morris-Suzuki has concluded that the ideas and practices of early modern Japanese economists “sometimes led them along paths curiously similar to those explored by their European contemporaries.”<sup>32</sup> These curiously similar economic paths should also interest us because economics is the practice under which the systematic utilization of nutrients and energy, the core activities of life on Earth, are often subsumed with our species. Given Japan’s global economic prominence today, that it shared patterns with Western Europe makes sense.

### *Labor and Knowing Nature*

The first achievement of a deep historical analysis of Japan’s discovery of nature is to dispel a pervasive myth about the island country, one that is often marshaled to explain the rise of Western Europe at the expense of Asian countries. The myth is that Japan has a special, nonintrusive, more subjective, and often-benign relationship to nature, one that views the natural world as alive with Shinto deities, interlaced with Buddhist continuums of life, and bounded by Confucian rites. Because of these traditions, the myth continues, the Japanese did not render nature as a lifeless, objectified resource for industrial exploitation. Rather, the Japanese conformed to nature by creating holism between cultural and natural spheres. The natural environment sprang to life for Japanese, which limited industrial development and control.

As Max Weber argued, unlike Western European philosophy that sought to adjust the world to meet human requirements, Confucianism, the core philosophy of East Asia, sought “adjustment to the world, to its orders and conventions.”<sup>33</sup> In sum: Western Europe bent the natural world to suit it, while Confucian societies bent themselves to suit the natural world. As a Confucian society, early modern Japan, too, is often viewed as conforming to the natural environment – a society in harmony with nature – rather than forcing the environment to conform to its needs. As a result, Weber insisted that, “Systematic and naturalist thought... failed to mature” in Confucian societies.<sup>34</sup> For Weber, the Confucian predisposition to defer to nature stymied development.

If viewed through the lens of labor and engineering, however, Japan’s relationship to the natural environment was often intrusive, probing, exploitative, and controlling, similar to post-Enlightenment Europe. Satô Nobuhiro (1769-1850), an eclectic early modern thinker, understood nature to be driven by creative forces, ones animated by Shinto deities. However, as Morris-Suzuki observes, “far from leading to a sense of peaceful coexistence between humans and nature, this theology

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<sup>32</sup> Tessa Morris-Suzuki, *A History of Japanese Economic Thought* (London and New York: Routledge, 1989), 7.

<sup>33</sup> Max Weber, *The Religion of China: Confucianism and Taoism*, translated by Hans H. Gerth and introduction by C. K. Yang (New York: The MacMillan Company, 1964), 152.

<sup>34</sup> Weber, *Religion of China*, 150.

led Satô to the conclusion that the most important task for human beings was to improve and make use of the resources provided by a benevolent nature.”<sup>35</sup> When describing the role of government, for example, Satô pronounced, in *Keizai yôryaku* (Summary of economics, 1822): “The development of products [*bussan no kaihatsu*] is the first task of the ruler.”<sup>36</sup> Humans organize into states, Satô suggested, in order to better exploit resources and control energy (basically, the NPP mentioned earlier).<sup>37</sup>

Importantly, the environment that Satô sought to develop was of largely human design, Japan’s contribution to the early lithostratigraphic and biostratigraphic signatures of the Anthropocene geologic epoch, which is characterized by the pervasiveness of the built environment.<sup>38</sup> In short, Japanese began discovering the natural environment through engineering the archipelago. If the Columbia River is an “organic machine,” as Richard White has suggested, then Japan might be seen as an inorganic archipelago, a string of islands envisioned as a controllable, exploitable, almost technological space.<sup>39</sup> This process started early in human history. With the advent of agriculture there came a “fundamental change in the relation between humans and the natural world.” According to David Christian, humans began to “affect other organisms” and “remake the nonliving environment” to better control access to nutrition and energy. Agriculture means removing undesirable species, creating artificial landscapes, and increasing the productivity of desirable species through better access to water and sunlight. Humans remade organisms around them, genetically engineering crops and hunting threatening species, such as Japan’s wolves, to extinction.<sup>40</sup> As they created this agricultural landscape humans “may have experienced a growing sense of separation between the ‘natural’ and ‘human’ worlds,” or a sense of “alienation” from natural conditions.<sup>41</sup>

An alienation from nature objectifies it and facilitates its indifferent exploitation. Carolyn Merchant has identified this objectifying “death of nature” hypothesis with post-Enlightenment European culture, but Japanese culture

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<sup>35</sup> Tessa Morris-Suzuki, *Re-Inventing Japan: Time, Space, Nation* (Armonk, NY and London: M.E. Sharpe, 1998), 50.

<sup>36</sup> Morris-Suzuki, *Re-Inventing Japan*, 50.

<sup>37</sup> Satô Nobuhiro, *Keizai yôryaku* (Summary of economics, 1822), in *Nihon shisô taikai* (Outline of Japanese thought), Vol. 45, edited by Bitô Masahide and Shimazaki Takao (Tokyo: Iwanami Shoten, 1977), 536.

<sup>38</sup> Will Steffen, Paul J. Crutzen, and John R. McNeill, “The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature,” *Ambio* 36, no. 8 (December 2007): 614-621.

<sup>39</sup> Richard White, *The Organic Machine: The Remaking of the Columbia River* (New York: Hill and Wang, 1996).

<sup>40</sup> Brett L. Walker, *The Lost Wolves of Japan*, foreword by William Cronon (Seattle and London: University of Washington Press, 2005).

<sup>41</sup> Christian, *Maps of Time*, 242-42.

underwent a similar process of alienation.<sup>42</sup> In Japan nature was slowly killed over historical time, but then theologians and philosophers stitched it back together and injected it with the anthropocentric life of Shinto and Buddhist deities. Nature became a marionette of the human craving for resources and energy, even though observers have long mistaken this raggedy, natural puppet for a living, freestanding nature.

Japan is rife with these alienating conditions, though they run counter to stereotypes about the archipelago of harmonious nature lovers. At least in part, the unnatural, geometric shapes of Tokyo Bay are examples of what Fukuzawa Yukichi (1834-1901), a nineteenth-century intellectual, meant when he wrote that, with adoption of Western civilization, the “whole landscape of Japan will be renewed.”<sup>43</sup> This is an important point because uncritically submitting that the physical environment sculpted Japanese culture and history, rather than the contrary, is standard fare in the historiography on Japan. In her otherwise excellent textbook, Anne Walthall has recently submitted that, “Geographic features shaped the development of Japanese civilization.”<sup>44</sup> This is the argument wherein we learn that Japanese culture is austere and efficient because the islands are small and resource deprived.<sup>45</sup> This persistent framework is rooted in Watsuji Tetsurô’s (1889-1960) environmental deterministic theories, first articulated in his *Fûdô* (On climate, 1935). Japan’s monsoon climate and its distinctive geography created its unique national culture. Japanese discovered nature as it was reflected in their cultural evolution over the centuries. Indeed, under this hypothesis, Japanese discovered their natural environment subjectively, inside themselves and their unique culture, because both were a product of external, environmental forces.<sup>46</sup>

This environmentally deterministic assertion – that Japan’s physical environment shaped its culture – is central for making the case for ethnic distinctiveness because it stands to reason that only Japanese people could be influenced by the Japanese islands. Julia Adeney Thomas has demonstrated how the *Kokutai no hongî* (Principles of the national body, 1937), a propaganda pamphlet published by the Ministry of Education during the Pacific War, tied the historical evolution of Japan’s national character to the physical environment, an assertion that has proved hard to dislodge. In 2011, for example, when global media gestured

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<sup>42</sup> Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution* (San Francisco: Harper & Row, 1980).

<sup>43</sup> Fukuzawa Yukichi, *An Outline of a Theory of Civilization*, translated by David A. Dilworth and G. Cameron Hurst (Tokyo: Sophia University, 1973), 3.

<sup>44</sup> Anne Walthall, *Japan: A Cultural, Social, and Political History* (Boston and New York: Houghton Mifflin Company, 2006), 9.

<sup>45</sup> Susan B. Hanley, *Everyday Things in Premodern Japan: The Hidden Legacy of Material Culture* (Berkeley and Los Angeles: University of California Press, 1997).

<sup>46</sup> Watsuji Tetsurô, *Fûdo: Ningengakuteki rôsatsu* (Iwanami Shoten, 1991). See also Tetsuro Watsuji, *Climate and Culture: A Philosophical Study*, trans. Geoffrey Bownas (Westport, CT: Greenwood Press, 1988).

toward Japan's "remarkable resilience" and "dignified stoicism" in the aftermath of the 3.11 triple disaster they unknowingly borrowed an attribute directly from the *Kokutai no hongii*, which also celebrated Japanese "fortitude" in the aftermath of natural calamities.<sup>47</sup> The pamphlet offers poetry on cherry blossoms as evidence of Japan's special relationship to nature. The pamphlet insists that Japanese "love nature," and that they have demonstrated their "exquisite harmony with nature from ancient times" through poetry, daily practices, and ceremonies.<sup>48</sup>

The text explained:

It is here [in the natural environment] that our national trait to love nature is begotten and the harmony between man and nature is established. Natural features overpower India, and in the West one senses that man subjugates nature, and no deep harmony is found between man and nature as in our country. On the contrary, our people are in constant harmony with nature. In literature, too, there are many poems that sing of this harmonious mind toward nature, and deep love toward nature forms the principal theme of our poetry. This is not confined to the world of literature; but in our daily lives, too, nature and human existence harmonize.<sup>49</sup>

In reality, however, it was not the Japanese who conformed to nature, but nature that conformed to the Japanese. Japanese have a long history of utilizing nature. Early Japanese states, influenced by Confucianism, marshaled the natural world as a metaphor to imbue reigns with moral authority. The sovereign is likened to heaven, explained Prince Shôtoku, and his subjects are likened to earth.<sup>50</sup> Three centuries later, Japanese courtiers discovered nature anew, now through an aesthetic lens. Heian courtiers savored poetry about chirping insects, barking deer, and turning leaves because they synchronized insect and deer calls, as well as autumn decay, with their own fickle, melancholic emotions. In nature they discovered disquieting change: relationships made and broken, as well as lives birthed and decayed. When Murasaki Shikibu, in *Murasaki Shikibu nikki* (Diary of Lady Murasaki), penned, "Can I remain indifferent to those birds on the water? I too am floating in a sad uncertain world," she linked her emotions, her unnerving

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<sup>47</sup> Hannah Beech/Akaushi, "Aftermath: How Japan Will Recover from the Quake," *Time* Sunday, March 20, 2011.

(<http://www.time.com/time/magazine/article/0,9171,2059619,00.html>)

<sup>48</sup> Julia Adeney Thomas, *Reconfiguring Modernity: Concepts of Nature in Japanese Political Ideology* (Berkeley and Los Angeles: University of California Press, 2001), 179-80.

<sup>49</sup> *Kokutai no hongii* (Principles of the national body, 1937) (Tokyo: Naikaku Insatsukyoku, 1937).

<sup>50</sup> Wm. Theodore de Bary, ed. *Sources of Japanese Tradition*, comp. Ryusaku Tsunoda, Wm. Theodore de Bary, and Donald Keene (New York: Columbia University Press, 1958), 50.

existential transience, to the unsettling transience of the changing world around her.<sup>51</sup>

In classical times, however, courtiers were not the only Japanese watching the natural environment, searching for meaning, even though our stereotypes of Heian Japan (794-1185), that shining world of princes, would seduce us into believing so. Early farmers – those environmental engineers *par excellence* – had discovered the environment as well, though they viewed it through the prism of labor: growing cycles, the rich soil on their hands, the irrigation channels they dug, the insects, blight, and weather they fought, and the crops they harvested and threshed. When discovering nature, the divide between Heian courtiers and nearby farmers proved a vast one. On one occasion, when Sei Shônagon (966-1025) and fellow courtiers ventured outside Kyoto to write poetry on the cuckoo, a relished springtime pastime, they encountered farmwomen threshing rice and singing with a “machine of a type that I had never seen before.” The farmwomen were interacting with the environment as farmers did. However, as Sei Shônagon recalled, the farmwomen’s song was so alien to the courtiers that they “burst out laughing,” and “completely forgot to write our *hototogisu* poems.”<sup>52</sup> It is a telling encounter: Heian women sought to celebrate nature through aesthetics, while farmwomen through threshing and song. Neither, however, understood the other, making it difficult for the historian to identify a particularly Japanese attitude toward nature in this encounter.

Early modern documents on insect eradication, through the use of both insecticides and rites, suggest that farmers had a different attitude toward insects than Heian courtiers, who wrote poetry on them. Japan has a celebrated insect literature, one that is often evoked as evidence of Japan’s harmony with nature.<sup>53</sup> But whole segments of Japan’s rural society spent their entire lives trying to eradicate pesky bugs, such as the Asiatic rice borer, from their fields. Such early modern agriculturalists as Ôkura Nagatsune (1766-1860) experimented on crops and insecticides in order to avoid deadly famine. In reality, he understood insects, as organisms, far better than Heian’s secluded poets did.<sup>54</sup> Similarly, in agricultural treatise (*jikatasho*) and farm manuals (*nôsho*), early agronomists, silviculturalists, and naturalists wrote on a range of topics, including forest management. Such authors as Miyazaki Antei (1623-97), in *Nôgyô zensho* (Complete work on agriculture, 1697), made pioneering connections between forests and rural life, as

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<sup>51</sup> *The Diary of Lady Murasaki*, trans. and intro. Richard Bowring (New York: Penguin Books, 1996), 22.

<sup>52</sup> *The Pillow Book of Sei Shônagon*, trans. Ivan Morris (London: Penguin Books, 1967), 119.

<sup>53</sup> See Sasakawa Mitsuhiro, *Mushi no bunkashi* (Cultural history of insects) (Tokyo: Bun’ichi Sôgô Shuppan, 1979) and Kasai Masaaki, *Mushi to Nihon bunka* (Insects and Japanese culture) (Tokyo: Daigyôsha, 1997).

<sup>54</sup> Brett L. Walker, *Toxic Archipelago: A History of Industrial Disease in Japan* (Seattle and London: University of Washington Press, 2010), 48-52.

well as between soil quality and forest health.<sup>55</sup> These connections evidence an increasing awareness of natural systems and the human place within them. In a similar way, female abalone divers, called *ama*, discovered an underwater marine environment when they dove in frigid waters to hunt for kelp and shellfish. This discovery of the underwater environment was more immediate, more thorough, and certainly deeper than the poets who only gazed at the ocean's surface. "The sea is a frightening thing at the best of times," observed Sei Shônagon in her *Makura no soshi* (The Pillow Book, mid-Heian). "How much more terrifying must it be for those poor women divers who have to plunge into its depths for their livelihood."<sup>56</sup>

In their history, Japanese had discovered nature in a variety of capacities, but the least gritty, the most distant from the physical environment, the most stylized, the most ethnocentric, and the least demographically pervasive manner, that of the Heian courtiers and their poetry, happens to be the one we tend to associate most strongly with the Japanese today. As recent as 2011, Christine Marran has analyzed how internationally acclaimed author Murakami Haruki (b. 1949), in a speech in the aftermath of the 3.11 triple disaster, mused on the relationship between nature, impermanence, and the "ethnic consciousness" of the Japanese. Murakami wrote, "Cherry blossoms, fireflies and red leaves lose their beauty within a very short time. We travel very far to watch the glorious moment. And we are somewhat relieved to confirm that they are not merely beautiful, but already beginning to fall, to lose their small lights and their vivid beauty. We find peace of mind in the fact that the peak of beauty has passed and disappeared." Here, the Japanese harmony with a living and dying nature is preserved in the writing of Heian courtiers, whose literary corpus and other artistic forms have been resurrected by Murakami to do the labor of Japan's ongoing "exquisite harmony" with nature. Meanwhile, the country is savaged by industrial pollution, re-sculpted by overly hubristic engineering practices, washed away by natural disasters, and poisoned by radioactive isotopes with half lives that will enable them to persist in the northeast at least as long as Matsuo Bashô's (1644-1694) poetry. "In the utter silence/Of a temple/A cicada's voice alone/Penetrates the rocks."<sup>57</sup> Now cesium, as much as the voice of any cicada, is a signature in this northeastern landscape.

It is through labor and engineering, as much as poetry or science, that Japanese discovered the natural environment. Richard White has observed that, "work itself is a means of knowing nature," even though it is often derided by environmentalists and ignored by scientists.<sup>58</sup> Focusing on labor as a means of

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<sup>55</sup> Conrad Totman, *The Green Archipelago: Forestry in Preindustrial Japan* (Berkeley and Los Angeles: University of California Press, 1989), 117-118.

<sup>56</sup> *The Pillow Book of Sei Shônagon*, 247.

<sup>57</sup> Nobuyuki Yuasa, trans. *The Narrow Road to the Deep North and Other Travel Sketches* (London: Penguin Books, 1966), 123.

<sup>58</sup> Richard White, "'Are You an Environmentalist or Do You Work for a Living?': Work and Nature," in *Uncommon Ground: Rethinking the Human Place in Nature*, ed. William Cronon (New York: W.W. Norton & Co., 1996), 171.

discovering nature suggests that Japan engineered its environment just as routinely and aggressively as Western Europe did, and in the process discovered nature outside the arena of aesthetics and the natural sciences. In this regard, it paralleled similar developments in Western Europe.

*Science, Dissecting the Body and Natural Discovery*

The development of the medical and natural sciences in Japan is another place to look for the discovery of nature and shares convergences with Western Europe. Early modern Japanese, drawing on Neo-Confucian science, constructed “folk-biological” life-form categories and “generic-specieme” taxons when cataloging the natural world in encyclopedias. They based differences between species on morphological qualities that, in many instances, resembled European Linnaean categories. This suggests that *Homo sapiens*, even those separated by vast cultural and geographic divides, remain cognitively predisposed to organize the natural world according to certain overarching patterns, ones that facilitated our organization and command of Earth’s resources and energy. Scott Atron, who has studied the human organization of nature, argues that, “there are not *any* intrinsic differences in our cognitive dispositions to classify natural” objects, suggesting that naming and categorizing nature takes place within certain epigenetic rules, the same ones that shape state development and certain agricultural practices.<sup>59</sup>

Nonetheless, the bookish learning of Neo-Confucian science should not be mistaken for the empirical experience gained in the field, including that gained through labor. It is conventional to identify early Japanese natural histories as evidence of a discovery of the natural environment, but actually they represented a discovery and rediscovery of Chinese philology. Take abalone, that valuable shellfish that *ama* gingerly plucked from the ocean floor. Abalone was mentioned by Fukane no Sukehito (898-922), in his path-breaking *Honzô wamyô* (Japanese names in natural studies, 922), a taxonomic work penned about the time of Sei Shônagon’s sympathetic reference to abalone divers, but judging from his entry, he had never ventured to see one in its natural habit. He clarified the various *kanji* and names for abalone, and listed the obligatory medicinal properties (a major driver in natural discovery), but he knew little of its natural environment.<sup>60</sup> Kaibara Ekken (1630-1714), in *Yamato honzô* (Natural studies in Japan, 1709), devoted several lines to abalone, but nothing is said about its natural conditions.<sup>61</sup> In other words, when traditional historians think of discovering and knowing nature, the tendency is to go to the documentation, to sift through the encyclopedic entries of Fukane no Sukihiro, Minamoto no Shitagau (911-983), Hitomi Hitsudai (1642-1701), Ono Ranzan (1729-1810), Kaibara Ekken, and others in order to glean early fragments of a discovery

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<sup>59</sup> Brett L. Walker, *The Lost Wolves of Japan*, foreword by William Cronon (Seattle and London: University of Washington Press, 2005), 28.

<sup>60</sup> Fukane Sukehito, *Honzô wamyô*, Vol. 2, ed. Yosano Tekkan, Masamune Atsuo, Yosano Akiko (Tokyo: Nihon Koten Zenshû Kankôkai, 1927-28).

<sup>61</sup> Kaibara Ekken, *Yamato honzô*, Vol. 2, ed. Shirai Kôtarô (Tokyo: Ariake Shobô, 1980), 178.

and understanding of the natural environment.<sup>62</sup> However, it was through labor and engineering that most early Japanese discovered and knew the natural world.<sup>63</sup>

But because labor represented the primary means that Japanese discovered nature in the pre-modern period, the medical arts, which often straddled science, daily practice, and work, represented an ideal arena to discover nature. The human body became a terrain for the discovery of the environment. This is counterintuitive because Neo-Confucian medicine favored a conservative, noninterventionist approach and there were always critics of opening and peering into bodies, particularly in the early modern years. But East Asian thought located nature within people, and connected bodies with environments, making dissection a means to indirectly probe the natural world.

The connections between bodies and nature, including the natural environment, are important ones. In the *Analects*, Confucius (551-479 BCE) said, “Man is born with uprightness,” and the object of life was to nurture that innate uprightness.<sup>64</sup> Mencius (372-289 BCE), using water and gravity as analogies, explained, “Man’s nature is naturally good just as water naturally flows downward.”<sup>65</sup> The juxtaposition of “nature” and “naturally” in Mencius set the tone for the subjective process whereby nature is discovered in oneself, not in some terrifying or pure wilderness, the “Cathedral” of the Western imagination.<sup>66</sup> With the emergence of the Song (960-1279) Neo-Confucian synthesis, Cheng Yiquan stated, “Thus the human nature which is said to be good is the root of nature.” In the natural world, “Each thing and every activity has its proper place,” so to behave naturally was to be in accordance with this universal, teleological principle of order.<sup>67</sup> Zhu Xi (1130-1200), the influential Chinese Neo-Confucian philosopher, emphasized that, “Nature is principle only” – the way things ought to be when things function naturally – and that, “Original mind is principle in itself, unmoved, and perfectly good.”<sup>68</sup> At this early date, discovering nature was about discovering and rectifying principle in oneself, or in environments around oneself, a process that placed people in syncretic motion with the natural world. But it also meant that the body remained pivotal to understanding nature and to a certain degree Japanese

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<sup>62</sup> Ueno Masuzô, *Nihon dôbutsugakushi* (Tokyo: Yasaka Shobô, 1987).

<sup>63</sup> James R. Bartholomew, *The Formation of Science in Japan* (New Haven and London: Yale University Press, 1989).

<sup>64</sup> *A Source Book in Chinese Philosophy*, translated and compiled by Wing-Tsit Chan (Princeton: Princeton University Press, 1963), 29.

<sup>65</sup> *A Source Book in Chinese Philosophy*, 65.

<sup>66</sup> William Cronon, “The Trouble with Wilderness; or, Getting Back to the Wrong Nature,” in *Uncommon Ground: Rethinking the Human Place in Nature*, ed. William Cronon (New York: W.W. Norton, 1996).

<sup>67</sup> A. C. Graham, *Two Chinese Philosophers: The Metaphysics of the Brothers Cheng* (New York: Open Court, 1992), 49, 17.

<sup>68</sup> *A Source Book in Chinese Philosophy*, 623, 590.



empirical sciences began with probing inside the body. Needless to say, there were critics.

In his scathing critique of the practice of dissection, for example, the physician Sano Yasusada, in *Hizôshi* (Against the organs of the body, 1760), ridiculed the need to even see human organs. In a rejection of empirical learning, Sano wrote of dissecting the body and observing the internal organs: “I cannot imagine what is to be gained by looking at them, listening to them, or talking about them.”<sup>69</sup> Other physicians, however, such as Yamawaki Tôyô (1705-62) and Sugita Genpaku (1733-1817), similar to their European counterparts, believed there was much to be gained by opening and probing the body. They sought to discover nature within the body. For some European and Japanese physicians, execution grounds, with their bird-pecked corpses and sun-bleached bones, proved irresistible hunting grounds.

In *Rangaku kotohajime* (The beginnings of Dutch learning, 1815), Sugita told the now-famous story of the dissection of an elderly woman, a criminal nicknamed Old Hag Green Tea.<sup>70</sup> Police had executed her at Kozukapara in April 1771. Usually, only outcasts handled dead bodies because of fears of defilement and pollution, which is one social factor that inhibited the empirical study of human anatomy in early modern Japan. (It is a cultural factor that also might have been born from epigenetic fears of the microbial diseases that spread from dead and decaying bodies.) Maeno Ryôtaku (1723-1803), another physician, accompanied Sugita, and brought with him a copy of *Anatomische Tabellen*, an anatomy text by the Danzig physician Johannes Adam Kulmus (1689-1745) published in German in 1725. Japanese knew the text by its Dutch title, *Ontleedkundige tafelen*, published nine years later. Maeno had obtained the copy in Nagasaki, where the Dutch East India Company traded with Japanese at the small, manmade islet of Dejima. Coincidentally, Sugita had acquired a copy of the text as well. Both Sugita and Maeno observed how differently the Dutch text depicted the lungs, heart, stomach, and spleen when compared to the anatomical images handed down by China. They initially questioned the accuracy of the Dutch text, but all that changed with the Kozukapara dissection, when they probed inside the body before them.<sup>71</sup>

Toramatsu, the outcast slated to perform the autopsy, took ill and his ninety-year old grandfather substituted for him. He sliced through Old Hag Green Tea’s wrinkled skin. As he pried open the flesh, he commented on the location of several

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<sup>69</sup> Timon Screech, *The Western Scientific Gaze and Popular Imagery in Later Edo Japan: The Lens within the Heart* (Cambridge: Cambridge University Press, 1996), 203.

<sup>70</sup> On the dissection of Old Hag Green Tea, see Grant Kohn Goodman, *The Dutch Impact on Japan (1640-1853)* (Leiden: E. J. Brill, 1967), 86-96; Donald Keene, *The Japanese Discovery of Europe, 1720-1830* (Stanford: Stanford University Press, 1952), 21-24; and Timon Screech, *The Shogun’s Painted Culture: Fear and Creativity in the Japanese States, 1760-1829* (London: Reaktion Books, 2000), 56-62.

<sup>71</sup> *Nihon no meicho*, Vol. 22, 105-106.

of the internal organs. But he also pointed to several organs for which he had no names. Sugita, on comparing them with the *Ontleedkundige tafelen*, identified them as arteries, veins, and suprarenal glands. The old man commented that, in all his times dissecting bodies, doctors present never asked about discrepancies between the actual body, lying filleted in front of them, and Chinese anatomical depictions. By contrast, Sugita and Maeno were amazed by the similarities between the Dutch text and Old Hag Green Tea's innards. Sugita and Maeno also gathered a few bleached bones from the Kozukapara grounds and noticed that they, too, were identical to those in the Dutch text. The Chinese depictions were completely inaccurate. What is more, many Chinese anatomical organs, such as the "six lobes and double auricles of the lungs" or the "three left and four right lobes of the liver," appeared to be complete fabrications.<sup>72</sup>

It is tempting to depict this moment as a critical milestone in early modern Japanese medicine, a revolutionary transition from the deductive, theoretical learning of Neo-Confucian medicine to the empirical observations born at the Kozukapara execution grounds. Indeed, in this sense, the moment is not unlike the dissections and anatomical sketches of the Belgian Andreas Vesalius (1514-1564) who, in his *De Humani Corporis Fabrica* (On the fabric of the human body, 1543), discredited millennia of anatomical theory, exemplified in the humorism of Aelius Galenus (129-199 CE). Not unlike the Neo-Confucian medical tradition embraced by Sano Yasusada and most of the early modern Japanese medical establishment, humorism, or Hippocratic medicine, viewed the body as comprised of four basic bodily fluids that corresponded to the Aristotelian Four Elements Theory – black bile (Earth), yellow bile (fire), phlegm (water), and blood (air). Excesses or deficiencies in these fluids lie at the root of human disease. This theory converged with Neo-Confucianism's Five Phase Theory that reduced the world to the five elements of water, wood, fire, Earth, and metal, which corresponded to colors, numbers, directions, and temperaments.<sup>73</sup>

In 1536, accompanied by his sidekick Regnier Gemma, Vesalius traveled to the execution grounds outside Louvain, Belgium, where he discovered the intact skeleton of a thief. Authorities had chained the thief to the gallows and then slowly cooked him alive, leaving the blackened flesh for hungry birds. Vesalius carted the remains home for his anatomical studies. At the University of Padua, near Venice, Vesalius continued with human dissections and nonhuman vivisections, replacing barbers (the European stand-ins for Japan's outcasts, at least where dissections were concerned) with his medical students. During these years, Vesalius conducted several public dissections, ones that rivaled theater, and the cumulative experience led to the publication of *Fabrica* in 1543. Though peers criticized Vesalius for his anti-Galenist conclusions and depictions, most notably his teacher, Franciscus

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<sup>72</sup> *Nihon no meicho*, Vol. 22, 106.

<sup>73</sup> For an exploration of some of the similarities between Greek and Chinese medicine, see Shigehisa Kuriyama, *The Expressiveness of the Body and the Divergence of Greek and Chinese Medicine* (New York: Zone Books, 2002).

Sylvius (1614-72), the work laid the foundation for the empirical study of the body in Europe and beyond.<sup>74</sup> Indeed, the large spectacles of public lectures and theatrical dissections at Padua characterized the post-Vesalian era, where students and teachers interacted to produce and disseminate anatomical knowledge.<sup>75</sup>

Though not as pioneering as *Fabrica*, and clearly influenced by European diffusion, Sugita's translation was a breakthrough in Japanese empirical thinking. Timon Screech has explained that the *Kaitai shinsho* (New anatomical atlas, 1774), Sugita's anatomical text inspired by the entire Kozukapara episode and essentially a translation of the *Ontleedkundige tafelen*, was "predicated on a novel epistemology of exposure and probing." However, similar epistemological rifts of "exposure and probing" had already fractured Japan's scientific geography. A culture of "exposure and probing" led Kosugi Genteki (1730-91), the private physician of Sakai Tadamochi (1725-75), the official representative of the Tokugawa *bakufu* (the shogun's government) in Kyoto, to conclude that Chinese anatomical depictions were "entirely wrong" after a controversial dissection he observed in 1751, conducted by his teacher Yamawaki Tôyô. Yamawaki conducted the dissection of a criminal's body at a temple in Kyoto near the Nijô Castle.

Yamawaki, in his *Zôshi* (Description of the organs, 1759), published the first Japanese anatomical text based not on Chinese learning but on empirical observations.<sup>76</sup> Later, Sugita commented on the dissection: "Judging from what he [Kosugi] saw, he found that all the knowledge handed down by ancestors was entirely wrong: they were all empty fabrications."<sup>77</sup> Indeed, by the eighteenth century, Japanese physicians had become increasingly skeptical of Chinese anatomical atlases. With few restrictions against opening the body and a ready supply of outcasts to circumvent those taboos that existed, early modern Japanese physicians could begin their empirical discovery of the human body. In other words, the discovery of nature – the body's nature, connected as it was to the surrounding environment – could proceed with little official intervention, though with some

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<sup>74</sup> A. M. Lassek, *Human Dissection: Its Drama and Struggle* (Springfield, IL: Charles C. Thomas, 1958), 90-105

<sup>75</sup> Cynthia Klestinec, *Theaters of Anatomy: Students, Teachers, and Traditions of Dissection in Renaissance Venice* (Baltimore: The Johns Hopkins University Press, 2011).

<sup>76</sup> Okamoto Takashi, *Kaibô kotohajime* (The beginning of dissection) (Tokyo: Dôseisha, 1988).

<sup>77</sup> Sugita Genpaku, *Rangaku kotohajime* (The beginning of Dutch learning, 1815), in *Nihon no meicho: Sugita Genpaku, Hiraga Gennai, Shiba Kôkan* (Japan's masterpieces: Sugita Genpaku, Hiraga Gennai, Shiba Kôkan), Vol. 22, ed. Haga Tôru. (Tokyo: Chûô Kôronsha, 1971), 103-104. For a translation of *Rangaku kotohajime*, see Genpaku Sugita, *Dawn of Western Science in Japan: Rangaku Kotohajime*, trans. Ryôzô Matsumoto and Eiichi Kiyooka, supervised by Tomio Ogata et al. (Tokyo: The Hokuseido Press, 1969).

jealous competition from Yamada Asauemon, who also sought to procure corpses at execution grounds to test razor-sharp *bakufu* blades.<sup>78</sup>

Even though such traditional physicians as Sano Yasusada, Yoshimasa Tôdô (1702-1773), Tanaka Hidenobu, and Fukuoka Sadaaki, decried the 1751 Kyoto dissection, official Neo-Confucian scholars, Tokugawa officials, and most other doctors remained relatively quiet on the matter. When Yamawaki corresponded with Gotô Gonzan (1659-1733) regarding the dissection, Gotô suggested that the Tokugawa *bakufu* was ambiguous on the topic of dissections.<sup>79</sup> In *Rangaku kotohajime*, Sugita wrote that Okada Yôsen (1722-97) and Fujimoto Rissen (1703-69), official *bakufu* physicians who had observed seven or eight dissections of their own, also noted the difference between the Chinese texts and actual bodies. To reconcile the fact, they speculated on the possible anatomical differences between Chinese and “barbarian” (in this case Japanese and European) anatomy. That they speculated on anatomical differences between Chinese and barbarians is not surprising, as such bogus racial theories of human difference also saturated Western medicine. Unfortunately, their writings on the topic of dissections do not survive (or at least not that I can find), but Sugita’s reference to their observations, when combined with Yamawaki’s *Zôshi*, suggest that a pent-up exploratory culture blossomed during Japan’s eighteenth century, one that resembled earlier experiences in Western Europe.<sup>80</sup>

With Vesalius and Sugita sifting through the corpses of the Louvain and Kozukapara execution grounds, a glimpse of our shared needs as *Homo sapiens* comes to light, one chapter in the great convergence of *Homo sapiens*. With knives in hand, Vesalius and Sugita discovered in the bodies of executed criminals the structures and mechanisms that comprised the human body, no matter what culture it came from. Discovering nature as it existed in the body satisfied an epigenetic requirement that transcended the post-Holocene geographical and cultural divides that separated Western Europe from Japan and united them, as they had once been on the African savanna, as members of an intensely inquisitive, linguistically talented, and information-disseminating species.<sup>81</sup>

Following the Kozukapara dissection, Sugita, in the *Kaitai shinsho*, scrapped the clumsier term *fuwake*, “dividing the viscera,” for *kaibô*, or to “dismantle/analyze” the body, the modern word for dissection. He wrote that ancient Chinese knew of dissection because the term appears in ancient medical texts, but that the practice

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<sup>78</sup> Ishide Takeshi, “Edo bakufu ni yoru fuwake kinsei” (Edo shogunate prohibitions against dissection), *Chiba igaku* (Chiba medical sciences) 84 (2008): 222.

<sup>79</sup> Ishide, “Edo bakufu ni yoru fuwake kinsei,” 222.

<sup>80</sup> Ishide Takeshi, “Edo no fuwake to Kozukapara no shiokiba” (Edo period autopsies and the Kozukapara execution grounds), *Chiba igaku* (Chiba medical sciences) 84 (2008): 7-13.

<sup>81</sup> Andrew Shryock and Daniel Lord Smail, *Deep History: The Architecture of Past and Present* (Berkeley and Los Angeles: University of California Press, 2011).

was not transmitted through the ages. Instead, he claimed that Japan had received the dregs of Chinese learning.<sup>82</sup> Sugita emphasized that, given the “experience” at Kozukapara, he and other physicians should learn the “true structure of the human body” in order to practice better medicine.<sup>83</sup> In the nineteenth century and at the dawn of Japan’s modern age, Sugita looked back at the popularity of Dutch medicine and speculated on the reasons why it flourished. One reason was because it “expressed facts as they were,” or an empirical rather than a deductive, philological reality. Sugita explained of Chinese learning that its “compositional style” was fundamentally “ornamental,” rather than empirical. Another reason Dutch learning flourished was because the “time was right for this type of learning,” with its greater emphasis on observations. This empiricism lies at the heart of the “true medicine” that actually “saves people’s lives,” he reflected.<sup>84</sup>

With these dissections, Japan, through indigenous development and diffusion from Western Europe, applied two of Ferguson’s “killer apps,” ones that had allowed Western Europe to begin its rise to global domination. But the important point is that Western Europe had no monopoly on such thinking, whether its invention, perfection, diffusion, or uses.

### *Conclusions*

A deep historical perspective highlights the great convergence that Japanese and Western Europeans shared, particularly in certain arenas of natural discovery. It has not been my intention to gloss important cultural differences – they are always there and I am keenly aware of them. Neither has it been my intention to reduce all of human experience to neurology and evolutionary biology, ignoring other powerful factors that drive human history. Rather, I have sought to offer one explanation for why so many patterns exist in history – both within our species and across the various species – in this case between Japan and Western Europe.

It comes down to this: humans have the same brains, the same neurological requirements, and the same needs for nutrition and energy. We are not only united together as *Homo sapiens*, but we are united with every other living thing on Earth, often in a symbiotic fashion.<sup>85</sup> Patterns exist not just in the human world, but throughout the nonhuman world as well. It is a requirement of a new inclusive history to explain these patterns, both their great convergences and great divergences.

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<sup>82</sup> Sugita Genpaku, *Kaitai shinsho* (New anatomical atlas, 1774), in *Nihon no meicho: Sugita Genpaku, Hiraga Gennai, Shiba Kôkan* (Japan’s masterpieces: Sugita Genpaku, Hiraga Gennai, Shiba Kôkan), Vol. 22, ed. Haga Tôru. (Tokyo: Chûô Kôronsha, 1971), 139, 144-147.

<sup>83</sup> *Nihon no meicho*, Vol. 22, 107, 111.

<sup>84</sup> *Nihon no meicho*, Vol. 22, 120, 131.

<sup>85</sup> Lynn Margulis, *Symbiotic Planet: A New Look at Evolution* (New York: Basic Books, 1999).

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