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Federico Marcon, *The Knowledge of Nature and the Nature of Knowledge in Early Modern Japan*

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This study deals with *honzōgaku* in early modern Japan (1600–1868), a subject Federico Marcon defines "as a field of study of Chinese origins ancillary to medicine" "devoted to the pharmacological properties of minerals, plants, and animals" (x), which only in the Meiji period (1868–1912) merged into the new academics of botany, zoology, and biology. By instancing its development, he intends to show that intellectual, economic, political, and cultural processes played a critical role in the secularization of nature and the objectification of natural species that populated Japan (5). Crucial in these processes were the commodification of plants and animals by the increasing commercialization of agricultural production, and their transformation into an intellectual commodity, which led to the objectification of nature. As specimens, he explains, plants and animals constituted the myriads of things that populated the world (*banbutsu*). Yet as species they become bearers of abstract characteristics: they become names (*meibutsu*) in encyclopedias and atlases, products (*sanbutsu*) in agronomical manuals and agricultural enterprises, medicinal substances (*yakuhin*) in pharmacopoeias, and curiosities (*kōbutsu*, *misemono*) in popular entertainments and amateur study groups (7).

The book is divided into five parts comprising thirteen chapters. It further provides a list of Japanese and Chinese terms mentioned in the text and a general index. There is no bibliography; instead, references and suggested further readings are given in notes at the end of the book. Parts 1 and 2 deal with the concepts of nature, space, and knowledge within the fields of science and history, covering such methodological approaches and topics as order, identification schemes, classifications, taxonomies, and language. Parts 3 and 4 address the changes of nature studies from individual endeavors to an autonomous field of study, beginning with shogunal initiatives at the beginning of the eighteenth century, and part 5 describes how honzōgaku finally became a more integrated and cohesive discipline toward the end of the Tokugawa period.

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In his methodological approach Marcon especially follows Theodor Adorno's (2006) negative dialectic and general claim that nature and history cannot be separated but must be understood in their dialectic interconnectedness: material things like plants, insects, and so forth become natural objects as a result of historically situated cognitive procedures, and the knowing process is never neutral but affects at the same time the knowing subject, the known object, and the world that contains them (14–15). Marcon positions himself between the naïve realism perspective that perceives knowledge as the unveiling of an unchanging nature and the skeptical antirealism perspective that reduces knowledge to social constructions; he does this by embracing a critical realistic approach in which nature and the naturalist continuously "make" each other (16). Although this book exposes the intertwined social, intellectual, economic, and political transformation of an early modern society by the actions of honzōgaku scholars, Marcon emphasizes that he refuses to interpret their activities as causes for the emergence of Western biological sciences in the late nineteenth century. He further objects to reducing honzōgaku to its mere utilitarian functions and also opposes those voices that see in the *honzō* (materia medica) studies an alternative conception of nature opposed to the environmental destruction of modern science or as an autochthonous protoscientific attitude that predisposed Japanese scholars to Western sciences. His intent is to reconstruct this field in its own terms (23–24).

Marcon thus challenges the notion held by Japanese scholars such as Yanagita Kunio and Sonoda Minoru that there always existed, unaffected by historical change, "a unified and unique Japanese identity in empathic relation with the natural environment" (4). This leads to fundamental questions of what nature actually is and what we mean by early modern science, issues addressed by Steven Shapin in his book *The Scientific Revolution* (1996). Shapin claims that no scientific revolution ever occurred in early modern Europe, and Marcon agrees, for the case of Japan, that the conception of science is not an ahistorical and neutral meter of judgment and that modern science is the cultural product of a particular historical time and situated knowledge reflecting the position of its producers in their historical, cultural, social, and material context (25).

Marcon further conforms with John Dupré (2001) and other philosophy of science scholars on the assumption that species are not natural kinds but social constructs, and he interlinks the process of reification of nature by honzōgaku scholars with economic processes, which structurally transformed the mode of production leading to the commodification of agriculture, the monetization of society, and the development of the market-oriented mechanism of commodity exchange (9–10). But not just the economic structure changed; according to him, professional scholars also established their socio-professional identity at that time. He therefore claims that, until the seventeenth century, up to which time intellectual production was reserved for Buddhist monks, court aristocrats, and samurai elites, there were no socially recognizable professional scholars. Thus, for him, the history of honzōgaku reflects also the establishment of professional scholars, such as Hayashi Razan, Kaibara Ekiken, Niwa Shōhaku, and Ono Ranzan (11–12). Yet it would be erroneous to reduce their knowledge to social conditions.

Another essential question that comes up in Marcon's honzōgaku study is whether an immanent order exists in nature or one imposed by the human mind. By naming things, Marcon explains, language performs a basic function of ordering reality into categories. Language also creates reality; it thus shapes individuals and societies as

well as the world they live in, an issue Marcon calls linguistic determinism. He therefore asks whether biological taxonomies are a functional or utilitarian fabrication of human societies or represent an inherent order of the natural world in itself. Marcon offers Adorno's negative dialectic as one way out of this linguistic determinism. Adorno stresses the nonidentity of matter and concepts and the preponderance of matter over thought. Concepts imprison material objects and render them manipulable for human needs but fail to completely subsume matter under their meanings. By this "excess" that escapes matter's reduction to concepts, we can understand the sociohistorical situatedness of knowledge (41–42). Marcon applies this to early modern Japan, showing that the adjustments of the *Bencao gangmu* (*Compendium of Materia Medica*), for example, reflect these sociohistorical contexts in which the Japanese naturalists operated. The *Bencao gangmu* is embedded in the neo-Confucian metaphysical framework as a legitimating platform for the classification of things that are based on empirical observation. This science, called the "science of the investigation of things" (*gewu zhi xue*), played an important role in the philosophical speculations of later Japanese scholars. Marcon describes the contributions of first generations of Tokugawa scholars, such as Hayashi Razan, Kaibara Ekiken, and Inō Jakusui, to show their roles in shaping natural knowledge and striving for intellectual recognition from a monk scholar to a Confucian scholar. They heavily relied on imported commentaries in the neo-Confucian tradition. By focusing particularly on Razan's *Tashikihen* (*The Explanation of Many Things*), Ekiken's *Yamato honzō* (*Japanese Materia Medica*), and Jakusui's *Shobutsu ruisan* (*Classification of All Things*), Marcon delineates their contribution to the making of honzōgaku. He notes that honzōgaku practitioners of the early stage of this research were not specially trained in schools or by specialists but, rather, were physicians or scholars who were well versed in Chinese learning. Their primary concern was to match the Chinese names for minerals, plants, and animals to those found in Japan (74). The study of natural history in seventeenth-century Japan was also affected by the rediscovery of ancient Chinese encyclopedias. Observation played a minor role, except for Ekiken; it was important only insofar as it could correct or verify the knowledge inherited from the past (75), but these dictionaries and manuals of materia medica were invaluable sources for painting and poetic composition, especially in the poetic forms of *waka* and *haikai* (83).

As a shogunal initiative of developing nature studies, Marcon selects Tokugawa Yoshimune's endeavors of reviving botanical gardens and cultivating ginseng. Yoshimune appointed herbalists (*saiyakushi*) traveled the country to spy while making an inventory of Japan's flora and fauna. Marcon also addresses the engagement of scholars and amateurs with "exotic" species, alive and in book format, describing how nature became a material commodity for popular consumption and an intellectual commodity for various cultural clubs and circles. He depicts three of these honzōgaku circles, their role in creating new social identities, and their entrepreneur character, which allowed them to survive in a varied market of cultural production (183). This resulted in the production of atlases and monographs with emphasis on illustrations. These illustrations experienced a major qualitative change in which the text became complementary and the illustrations took over the role of identifying a species by making visible their characteristics as a species, that is, the means to recognize a species when looking at a specimen. Like the illustrations in early modern Europe, Marcon concludes, those in Japanese atlases served to discipline and restrain empirical

observation rather than merely register its results (248). Natural objects as *misemono* led to displays of exotic plants and animals in teahouses and in parades. One of the most famous organizers of these exhibitions was Hiraga Gennai, whose manifesto Marcon translates to exemplify how Gennai planned and organized these exhibitions. Natural objects became commodities, freed from any metaphysical necessity (250). Honzōgaku finally resulted in the academic field of botany, in which key figures, such as Philipp Franz von Siebold and Udagawa Yōan, who developed a new terminology for naming plants and animals and a new technical language, played a pivotal role (259). The term *honzōgaku* itself disappeared in the following Meiji period, but it survived in part under the new rubric of *hakubutsugaku* (natural history) (303).

Compared to Japanese research on honzōgaku, where we can build on existing works, such as that of Sugimoto Tsutomu (2011), in Western-language scholarship this topic is much less researched. In contrast to existing studies on the history of Chinese botany and taxonomy, such as Georges Métailié's *Traditional Botany: An Ethnobotanical Approach* (2015), we find Western works that only touch this topic, as Julia Thomas (2001) did when she tackled nature from a political-ideological perspective by examining Japanese thinkers from the nineteenth to the early twentieth century. Marcon fills this gap by not only summarizing Japanese scholarship in this area of study but also expanding the scope of research and showing its embeddedness in a given social and economic historical context. It is thus not an exaggeration to say that his work constitutes the basis for further research in this field; therefore, I mention here some suggestions for a probable revised version. Since this book outlines the "botanical" history of Japan and therefore provides valuable information for the interested reader, additional source references or bibliographical information would be highly appreciated, for example, in the case of medicinal gardens (121) or a translated passage of Gennai's manifesto (54). A revision of the text would also be a good opportunity to recheck the notes against the main text (especially note 39 on page 365), and the translation of *kibi* 黍 and Ekiken's transliteration of it (143; see also Ekikenkai 1910–11, 6:91–92). *Kibi*, for example, is in general referred to as (common) millet and not as sugarcane, which is also a species of grass but belongs to the genus *Saccharum*. As Marcon has pointed out, ginseng played a crucial role in Japan's medical history, yet it was known in Japan before the fifteenth century (123): the root was sent to Japan in the Tenpyō era (729–49) as a gift from Korea (see Suzuki 1994: 319–21). Nevertheless, these points should not diminish the value and brilliance of this work, which provides the reader with invaluable information about the field of honzōgaku by being an inspirational source for readers interested in the context of history of science, knowledge, economy, and society.

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