3. Disciplined Objects? Wood panels from the Kew Collections[1]

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Abstract: This chapter analyses a set of twenty-six wooden panels currently held at Kew's Economic Botany Collection. Katō Chikusai produced the set at Koishikawa Botanical Garden in Tokyo in 1878. By taking seriously the methodological and discursive presuppositions that are often and easily overlooked in studies of early Meiji visual objects, this chapter reorients the perspective to one that privileges the context of the production site of the wood panels over their current location. Through historically informed analyses, this chapter highlights how these objects carry two constitutive values – economic and epistemic – of early Meiji Japan.

Keywords: Knowledge production, material culture, Meiji, botanical garden, Katō Chikusai

The central object of analysis in this chapter is a set of twenty-six wood panels currently held at Kew's Economic Botany Collection.[2] The set was produced in

1 The initial research of this chapter's content began in 2011 when Christine Guth shared with me her encounter with these objects. I then presented a version of my analysis at "Curious and Scientific Things: Seeing and Knowing in Early Modern East Asia," organised by Doreen Mueller and Fan Lin at Leiden University in October 2018, where I received constructive feedback. Further conversations with Kurata Aiko and Richard Checketts were instrumental in the following research and thinking. I am grateful for their support and feedback. I also want to acknowledge Doreen and Fan's tireless effort to bring this publication forward and the support from proofreaders we received throughout the process.

2 A larger collection consisting of 152 panels, also bearing the name of Katō Chikusai, is at the Botanisches Museum Berlin-Dahlem. They are said to have originally belonged to the Schaumuseum of the Botanisches Museum Berlin-Dahlem. Moreover, eight comparable panels are located in the Harvard University Herbaria, and nine are in a private collection in London. Recently, another twenty-five panels were discovered at the Koishikawa Botanical Garden. Given the time and space constraints of the present volume, this chapter focuses on the Kew panels. For the most recent comparative investigation of these sets, see Toshiyuki Nagata, et. al., "An Unusual Xylotheque with Plant Illustrations from Early Meiji Japan," in *Economic Botany* 67(2) and H. Walter Lack, "Plant Illustration on Wood Blocks: A Magnificent

Fan Lin and Doreen Mueller (eds), *Picturing Animals and Plants in Early Modern China and Japan. Innovation, Experiments, and Anxieties*. Amsterdam: Amsterdam University Press 2025
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Figure 3.1: Katō Chikusai, *Sapindus Mukorossi (Mukuroji),* 1878. Tempera on wood. Kew Gardens, London.

1878 at the Koishikawa Botanical Garden in Tokyo. Each of the twenty-six panels bears a stamp with Katō Chikusai (1818–1886)'s name on the reverse in red ink.[3] Measuring about 34 x 23 x 3 cm, each panel uses at least nine physical pieces from an actual tree: 1) one rectangular board cut flat-sawn from the trunk of the tree; 2) four corner pieces made from the branches of the tree cut quartersawn; and 3) four rectangular pieces of the bark and sapwood placed on the edges of the central board. These pieces have been fitted together with glue and nails. The front of the central section carries a pictorial representation of the tip of branches of the tree in question, including flowers and leaves, and fruit if applicable, in what appears to be tempera pigment (Figure 3.1). A white label is attached to the back. It includes the name of the tree in Chinese characters and Japanese *katakana* script, as well as a Latin binominal name in Roman alphabet. How these panels came to the Kew is unknown.[4]

In the recent discussions of these wood panels, scholars underscore the shared similarities with what is referred to as a 'xylotheque.'[5] This term refers to a collection of wood samples and its history dates to late-seventeenth-century Europe, mainly found in Germany. The standard form of a specimen in a xylotheque takes the form of a book, its 'spine' covered by the bark of the tree in question, and its contents consisting of dried specimens of leaves, twigs, and fruits. The wood panels at the Kew are posited as an unusual departure from this prototype in that they provide visual representations instead of actual parts. Nonetheless, on a visual level, the similarity of format between a xylotheque and the wood panels as well as the panels' use of Linnaean taxonomy appear to privilege the putatively 'Western' science of botany.[6] These wood panels strike contemporary viewers and scholars alike with a sense of surprise.

Japanese Xylotheque of The Early Meiji Period," in *Curtis' Botanical Magazine,* vol. 16, no.2 (1999). The following paper, in Japanese, provides detailed information and analysis based on recent reading of logs from the Koishikawa Botanical Garden: Murata Hiroko, Sakazaki Nobuyuki, Sakurada Michio, Tōma Tetsuo, Murata Jin, "'Meiji jūshichinen jūnigatsu Tokyo Daigaku shokubutsuen shaseizu (mokuroku)' oyobi Koishikawa Shokubutsuen shōzō mokuzai hengaku nitsuite," in *Itō Keisuke nikki* [The Diary of Itō Keisuke], vol. 19 (Nagoya: Higashiyama Botanical Garden, 2014). I would like to thank Christine E. Guth for letting me know about these objects many years ago.

3 The year of Katō's death has been taken from Nagata Toshiyuki, "Shokubutsugahō sōmeiki no tsuiseki – Katō Chikusai hengaku kara," in *Seibutsu no kagaku iden,* vol. 71, no.3 (May 2017): 191.

4 Mark Nesbitt, "Puzzling Panels," *Kew Magazine* (Spring 2010): 54–55.

5 The term 'xylotheque' consists of the Greek words *xylon* (meaning wood) and *thêkê* (meaning place, and by extension repository). Another term is 'xylarium,' consisting of *xylon* and the Latin word *arium* meaning 'location' or 'receptacle.'

6 For convincing expositions on the concepts of 'the West,' 'the East,' 'the Orient,' and 'the Occident,' see Martin W. Lewis and Kären Wigen, *The Myth of Continents: A Critique of Metageography* (Chicago, IL: University of Chicago Press, 1997), especially "Chapter 2: The Spatial Constructs of Orient and Occident, East and West."

This sense of the unanticipated, I suggest, arises from a particular habitual and often unexamined methodological assumption. In this postulation, the application of Latin nomenclature and the adaptation of the xylotheque seem to exemplify 'Western influence' on these objects, and Japan in the nineteenth century is imagined to be distanced from immediate and explicit sites of *botanical* practice. Indeed, the locations of the collections in which the panels are held, including Kew, intensifies the desire to view the objects as being enveloped by stages of Western influence – first the absorption of Linnaean nomenclature, then the format of the xylotheque. The pictorial rendition on the board appears to cohere with Western pictorial traditions. One notices, for example, that the appearance of the leaves is conveyed through subtle differentiations in hues, resembling contemporary European illustrations of botanical specimens. The prevailing characterisation of the 1868 Meiji Restoration as the beginning of Westernisation of the country heightens the propensity to frame these panels as objects attesting to a socio-political pivot, and the changes in the direction and mechanism for knowledge production that followed.

Peter Dear, a historian of science, asserted that the development of science is a story of two lines of investigations: that of natural philosophy and the other of instrumentality. Dear further asserted that intelligibility is key in making natural philosophy plausible.[7] While Dear was mainly concerned with histories of science in the West, his formula is elucidating in relation to these wood panels because the objects are also marked by particular moments of plant science and art history in Japan.

If we follow his further assertion that "the world pictures that we believe in owe much more to what we find plausible than to the way the world 'really' is: their acceptance, rather than being determined by the natural world itself, depends on the ways in which we choose to live in the world," then this group of objects begs us to examine from which world we are assessing them, to which world we think the objects belong, and how flexible our framing worldview could and should be. I will argue that this group of objects carry layered marks and significances. They are attached to values informed by multiple concerns – epistemic, economic, legal, and pictorial – which emerged both in and outside mid-nineteenth-century Japan.

Disciplinarity and the Wood Panels

Does the periodisation, positing Tokugawa as feudal and Meiji as Westernising periods, account for the ways objects look, or the way they function, or the way

7 Peter Dear, *The Intelligibility of Nature: How Science Makes Sense of the World* (Chicago, IL: The University of Chicago Press, 2006), 194.

they are put together? We know that in the previous Tokugawa period, studies of *materia medica* (Ch: *bencao,* J: *honzō*), which constituted the key component of medical knowledge and practice, took elements of botanical knowledge from publications on natural history in Latin.[8] Moreover, the framework and the utility of this body of knowledge remained embedded within medical knowledge well after the 1868 Meiji Restoration.

It is helpful to situate the often-quoted remark made about the wood panels in 1878 by Edward S. Morse, an American teaching zoology at the University of Tokyo, that they are "an ingenious way to teach *botany*." The subject of *botany* had been institutionalised in Japan as independent from the medical field for merely three years when Morse made this claim.[9] The clear distinction between the field of *materia medica* (or *honzōgaku*) and *botany* (or *shokubutsugaku*), which Morse ascribed to these objects, thus needs to be approached with a grain of salt.

The narrative arch for perceiving the application and appreciation of *botany* as part of a necessary seismic shift within the production of 'scientific knowledge' in nineteenth-century Japan and, more broadly, East Asia, typifies the methodological approach to visual materials of Meiji Japan.[10] In fact, I have relied on this method in my earlier work. According to this logic, these objects fill the role of evidence that bears witness to the 'successful' (read: accurate) transmission of a body of *botanical* knowledge from 'the West' to 'the East.' But this logic conversely highlights the absence of history from another side. That is, these objects also stood at another transection of intellectual and material histories untethered by the discourse of *botany* per se. Why these types of wood, and not others, for example? What stakes were involved in the production of these objects in Tokyo in 1878?

This chapter represents an attempt to redress the current narrative on these objects by taking seriously the motivations and challenges that existed at the place and time of the inception of these wood panels. I ask questions regarding the decisions made in the process of production, and the conditions of the Koishikawa Botanical Garden, to place these objects as evincing historical challenges of different

8 See my book, *The Premise of Fidelity: Science, Visuality, and Representing the Real in Nineteenth-Century Japan* (Stanford, CA: Stanford University Press, 2012).

9 Quoted in Nagata et al., "An Unusual Xylotheque with Plant Illustrations from Early Meiji Japan," p. 95. Also see, Edward S. Morse, *Japan Day by Day*, vol. 1 (New York: Houghton Mifflin Company, 1917), p. 396. Here, I take the 1875 decision to change the name of the *Koishikawa Botanical Garden* from *Igakukō yakuen* [Medicinal Herbal Garden of the Medical School] to Kyōikuhakubutsukan fuzoku Koishikawa shokubutsuen [Koishikawa Botanical Garden of Educational Museum] as a decisive shift. I will expand on this point more fully later in this chapter.

10 In this regard, Carla Nappi's work on Chinese medicine is particularly relevant. See Carla Nappi, *The Monkey and the Inkpot: Natural History and Its Transformations in Early Modern China* (Cambridge, MA: Harvard University Press, 2009). Also see her historiographic intervention in the article "The Global and Beyond: Adventures in the Local Historiographies of Science," in *ISIS*, 104 (2013): 102–110.

orders. What is the relationship between the two discourses, *materia medica* and *botany*, in the context of 1870s Japan? Was there a concerted effort on behalf of the government to replace one with the other? Or do elements of *materia medica* inform their practice of *botany* in epistemological and physically practical ways? And on a more historiographical level, to whom/what, why, and on what level, does the articulation of a power relationship matter between the two?

Specifically, I explore how these objects related to and functioned within the material culture of knowledge production. By shifting the perspective from the current location of the objects to one that privileges the origin of the objects and their conjunctural historical and political context, this chapter investigates how these objects embody economic functions and epistemic values that were paramount to the historical landscape of Meiji material culture. I thus situate the wood panels as objects located between two constitutive forces conditioning Koishikawa Botanical Garden and its employees. For the sake of clarity, I divide these forces into 1) economic and 2) epistemic, although the relationship between the two interlocks significantly.

Skills of Assemblage, Connecting Art and Economy

The Japanese term for fine art, *bijutsu*, was coined in 1872 in the context of a translation of the official invitation to participate in the Vienna World Exposition. The neologism *bijutsu* enabled the Meiji government to set apart selected objects from others, which immediately created a hierarchical order.[11] Many scholars have demonstrated how both international and domestic expositions played vital discursive roles as public sites for the evaluation and promotion of 'fine art."[12] Conversely, these studies of historical conditions also reveal the fact that the image-makers in Tokyo did not – and could not – operate in the same way artists of the same period did in Paris, for example.

This historical incongruence poses methodological and historical challenges when we consider these wood panels. On what level can we characterise Katō's

11 See Suzuki Hiroyuki's *Kōkokatachi no jūkyūseiki: Bakumatsu Meiji ni okeru monono arukeoroji* (Tokyo: Yoshikawa Kōbunkan, 2003) and its English translation *Antiquarians of Nineteenth-Century Japan* (Los Angeles, CA: The Getty Institute, 2022). Kinoshita Naoyuki's publications explore objects excluded from the framework of 'fine art' within the visual culture of Meiji Japan. See especially, *Bijutsu toiu misemono* (Tokyo: Heibonsha, 1993); *Shashin garon* (Tokyo: Iwanami shoten, 1996); and *Yonotochūkara kakusareteirukoto*: *Kindai nihon no kioku* (Tokyo: Shōbunsha, 2002).

12 Satō Dōshin, *Modern Japanese Art and the Meiji State: The Politics of Beauty* (Los Angeles, CA: Getty Publications, 2003); Alice Tseng, *The Imperial Museums of Meiji Japan* (Seattle, WA: University of Washington Press, 2008); Norota Junichi, *Bakumatsu Meiji no biishiki to bijutsuseisaku* (Kyoto: Miyaobi shuppansha, 2015).

involvement in the production of these objects as belonging to the accepted category of 'artwork'? If we continue to describe Katō as an artist of these objects, what historical condition might be overlooked in such an approach, and what are the implications of such a decision? Similarly, Katō did not come to support the efforts at the Koishikawa Botanical Garden as a *botanical* illustrator. To what extent does his knowledge of *botany* matter in the production of these wood panels? I pose these not merely as semantic questions. In the context of this chapter, these series of questions highlight the scale of the challenges posed by methodological and discursive presuppositions that are easily overlooked.

Although there is no archive of Katō Chikusai as such, it is possible to compile a list of Katō's activities from historical records. In 1877, one year before the production of the Kew panels, Katō submitted a picture made with bamboo and *sawara* cypress to the First Domestic Expositions for the Promotion of Industry.[13] In a ranking list published in 1880, Katō is noted as an accomplished calligrapher, while his name appears as a notable painter in the Japanese tradition on the list of artists participating in the domestic exhibition of paintings in 1882.[14] Katō appears to have worked in at least three types of representations, eliciting distinct expectations from viewers: as an illustrator of plants for specialised purposes; as a painter in the Japanese tradition; and as a calligrapher. The inclusion of his names and varied skills in these lists become further complicated when we consider his own publication *Secrets of Paintings* (*Tansei hiroku*) in 1883. Here, Katō squarely presents himself as an experienced and trained painter in the Kanō pictorial tradition. These records present an image of Katō as resourceful in securing an income from his pictorial skills. The media he is associated with – calligraphy, Japanese painting, or, more specifically, Kanō school painting, and his illustrations at Koishikawa Botanical Garden – all use the brush to produce two-dimensional representations.

The question of disciplinarity on which I have expanded so far, can be summarised in the following observations: the transgressive and transdisciplinary

13 Submitted under Section 2, pictorial albums, Katō is named as the contributor for an item described as "coloured picture of flower and bird made with bamboo and *sawara* cypress." Tokyo kokuritsu bunkazai kenkyūjo, *Naikoku kangyō hakurankai bijutsuhin mokuroku* (Tokyo: Tokyo kokuritsu bunkazai kenkyūjo, 1996), 40. No description or price regarding the piece is given in the exhibition catalogue. Rather, a short description notes: "Studied skills of picturing under Kanō Tsunenobu, and in the end carried the pen name of *Kagawa*." *Meiji jūnen naikoku kangyō hakurankai shuppin kaisetsu*, included in Fujiwara Masato (ed.), *Meiji zenki sangyō hattatsushi shiryō* (Tokyo: Meiji bunken shiryō kankōkai, 1963), vol. 7, 73. Satō Dōshin asserts Katō submitted another item for the Second Domestic Expositions for the Promotion of Industry and received an award.

14 Miyata Uhei, *Tokyo shotaika raimeikyō* (Tokyo: Miyata Uhei, 1880), https://www.tobunken.go.jp/materials/banduke/806966.html; Otsuki Kinju (ed.), *Meiji jūgonen kaiga kyōshinkai shuppin gaka jinmei ichiran* (Osaka: Otsuki Kinju, 1883), https://www.tobunken.go.jp/materials/banduke/806931.html.

Figure 3.2: Recto of Figure 3.1. Red stamp noting "Meiji 11-nen, saishin hatsumei Katō Chikusai."

attributes revealed through examinations of these wood panels as a part of Meiji material culture, and the difficulty of situating Katō's work within a Eurocentric art historical taxonomy based on the putative concept of *medium*. The special red seal placed on the back of wood panels leads us to expand on the contextual and interpretive fields (Figure 3.2).

Word Matters: Patent for the Nation

It is in this initial step to probe the disciplinarity prescribed to this group of objects that the red seal placed on the back of each panel emerges as a significant sign. It reads "*Meiji 11-nen, saishin hatsumei Katō Chikusai,*" which can be translated roughly as "1878, the latest invention by Katō Chikusai." What would be the value and the point of producing a special stamp like this in 1878 and marking the object with it? What did Katō want to achieve with this stamp? What did he mean by the term *invention* (*hatsumei*) and why was it important to assert this?

Curiously, Takahashi Korekiyo (1854–1936), the first chief of the Japanese Patent Office (Tokkyokyoku), established in 1887, noted an intriguing insight in his autobiography: The 1885 process of drawing up a patent law was much influenced by the fact that the new Meiji government had had to withdraw earlier patent legislation

in 1872.[15] Further, he noted that the failure of the earlier edict had resulted from two main causes: 1) establishing a panel of judges to review submitted applications would require hiring costly Westerners and appropriate translators; and 2) ordinary people found the concept of patent difficult to understand. Indeed, the extent of its failure was such that that the edict was withdrawn within a year of its promulgation. Between 1872 and 1885, Takahashi notes, the members of the rule-making body, the Councillor's Office (Sanjiin), persistently expressed strong opposition to the reintroduction of the patent law. At the same time, pressure on the Japanese government from 'foreign entities' to adopt some form of patent protection was increasingly palpable. The Kew panels were produced during the period between the first patent edict of 1871 and the final implementation of patent law in 1885. The word *hatsumei* included in the seal on the back of every panel thus serves as a keyword addressing the objects' economic potential on the one hand, and societal confusion the notion caused on the other.

Apparently, part of the difficulty in conveying the idea of patent lay in linguistic deficiency and perplexity. The word *hatsumei*, which I have translated as 'invention,' was interchangeable with *hakken* around this time. The term *hakken* would only solidify its meaning as 'discovery' in the contemporary English sense by the late nineteenth century. The first edition of James Curtis Hepburn's Japanese–English dictionary provides a clue to the historical and translational muddling. In the first edition, published in 1867, *hatsumei* is defined as "intelligent, ingenious, and clever." Within this entry, it is noted that its verb form means to "invent and discover" implicating the historical interchangeability of the two English verbs. The English word *discover* is defined by four Japanese verbs, "arawastz; mi-dasz; mi-tszkeru; hatszmei szru" while there is no entry for the Japanese term *hakken* altogether.[16] Furthermore, in the hugely popular Japanese translation of *Self-Help*

15 Takahashi Korekiyo, *Takahashi Korekiyo jiden* (Tokyo: Chikura shobō, 1936), pp. 218–219, http://dl.ndl.go.jp/info:ndljp/pid/1207485. The edict was issued on the seventh day of the fourth month of 1871 and withdrawn in the third month of 1872. To be sure, protection for copyright was issued as publication regulation (*shuppan jōrei*) in 1870, and the subsequent modifications of this law in 1872, 1875, and 1887 served as a way to protect rights, including photographic negatives.

16 The dictionary defines the English verb 'to discover' as "arawatz; mi-dasz, mitsukeru, hatszmei-szru" while the verb 'to invent' is defined as "hatzumei szru; takumu; takunamu." James Curtis Hepburn, *A Japanese and English Dictionary*, first edition (Shanghai: American Presbyterian Mission Press, 1867), pp. 25, 55, 96, and 164. At the same time, the English term 'monopoly' is defined as "kabu," and 'patent' is also defined as "kabu," a word conversely defined in the same dictionary as "[t]he stump of a tree. A government license, a guild, or fraternity of persons engaged in a same kind of business; a habit or custom to which one is addicted." For a recent exploration of how the term *hatsumei* functioned within regulations put forward by the Tokugawa *bakufu*, see Satomi Kobayashi, "Edojidai ni okeru hatsumei sōsaku to kenrihogo," in *Patent* vol. 61, no, 5 (2008), pp. 48–55. It is also noteworthy that it was James Curtis Hepburn, the compiler of this very English–Japanese dictionary, who first applied for copyright protection with the Meiji government. Hepburn's request in 1874 prompted the government to investigate more fully

(1859) by the Scottish educator and social reformer Samuel Smiles (1812–1904), published in 1870, the terms *hatsumei* and *hakken* remain undistinguished.[17] In this way, these wood panels begin to merge with broader context to inform and direct our understanding. The stamp Katō placed on the back of the wood panels allow us to see them as concrete objects to confer the fluctuating semantic field of *hatsumei* (invention) and its socio-economic ramifications.

One telling aspect of the Patent Office as established in Meiji Japan is that the office was administered by the Ministry of Agriculture and Commerce. In Europe and the United States, patent offices had historically operated under the Ministry of Justice as it concerned individual rights.[18] This idiosyncratic Meiji configuration illuminates the specific historical and political context: the newly formed national government saw the issue of patent in the light of national resources and agricultural and commercial activities.

Unsurprisingly, Fukuzawa Yukichi's seminal book *Conditions in the West* (Seiyō jijō, 1868) included a description of a patent office. In this popular book, based on his observations made in the UK, the Netherlands, France, and the United States, Fukuzawa, an avid proponent of Westernisation, refers to the patent office phenomenon as "*hatsumei kan*."[19] He described the institution as an important piece of infrastructure that evaluates the benefit (*eki*) for society at large (*yononaka*) as well as the individual (*hito*), in that order. The language and intent of the 1871 edict likewise carried the sense of national benefit prioritised over the protection of the rights and the income of the individual. Its first article, for instance, addresses industry rather than individual inventors.

both the copyright and patent issues. David Murray, an 'employed foreigner' at the Ministry of Education, mediated between the Meiji government and Hepburn. See Takahashi Korekiyo, "Wagakuni tokkyoseido no kiin," in *Kōgyō syoyūkenzasshi* vol. 32 (1908), republished online by the Institute of Intellectual Property under Takahashi Korekiyo ikōshū, https://www.iip.or.jp/chizaishi/korekiyo_ikosyu.html.

17 *Self-Help* and Fukuzawa Yukichi's *Seiyō jijō* (*Conditions in the West*, 1868) played significant roles in moulding the minds of the young Japanese, the former being used as a textbook. The translator of *Self-Help*, Nakamura Masao, uses *hatsumei* to translate the English noun 'discoveries.' For example, what is in Smile's original "although there are discoveries which are said to have been made…" is rendered as "*inishie yori gūzen ni sonokotowo hatsumei serito iukotoari…"* See Samuel Smiles, trans. Nakamura Masao, *Saigoku risshihen: genmei jijoron,* vol. 4 (Tokyo: Suharaya Mohei, 1870), p. 2., https://dl.ndl.go.jp/pid/1086561. In *Bunmei kaika naigai jijō* (Outline of Civilisations Domestic and Abroad), published in 1873, the author, Tōkō Gakujin, includes a section on the Patent Office and describes how possession of the patent for a craft can lead to a guaranteed prosperity for generations. See Tōkō Gakujin, *Bunmei kaika naigai jijō* (Tokyo: Higashinari Kamejirō, 1873), vol. *chū*, pp. 29–33, https://dl.ndl.go.jp/pid/761509.

18 Christopher Heath, "Intellectual Property and Anti-Trust," in Wilhelm Röhl (ed.), *History of Law in Japan Since 1868* (Leiden: Brill, 2005), p. 406.

19 Fukuzawa Yukichi, *Seiyo jijō,* vol 3. Appendix (Kyoto: Hayashi Yoshibei, 1868), p. 10, https://dl.ndl.go.jp/pid/993194.

> Article 1: The government will provide official patents for those new inventions (*hatsumei*) in the industries of chemistry, machinery, armoury, and textiles, as well as those outside of these industries that have not been recognised in the country. The government will also give a patent for those items which have improved on existing items and bring more convenience to society. These patents will have expiration dates.[20]

Fukuzawa's characterisation of a patent as a fundamental asset to build national wealth was cemented further with the 1887 establishment of the Japanese Patent Office under Takahashi Korekiyo.[21]

In addition, the concept of *hatsumei* emerged as a critical and ambiguous notion within the discussions held at the Council of Elders (Genrōin), a legislative assembly, in the context of patent legislation.[22] For instance, Mitsukuri Rinshō (1846–1897), a member of the Council and a specialist in French law, explained *hatsumei* first as being akin to the English noun 'discovery.' He noted that 'discovery' is an act of man finding new uses for natural elements, and listed electricity and steam power as examples. He then articulated a second meaning of the word *hatsumei* as a process of adding manpower to existing natural elements, and this, he noted, is the same as 'innovation' in English. He finally articulated a third type of *hatsumei*, which is one that improves upon a previous invention, for which the improver can only apply a patent for the proposed modification. Following Mitsukuri's articulation of the concept of *hatsumei*, the discussion moved to the difficulty in drawing the line between the original and the improvement, and the processes of evaluating such an improvement in textual or graphic formats. During this contentious and lengthy discussion, *hatsumei* was used as a term to encompass the three concepts of discovery, innovation, and improvement.[23] Katō's use of the term *hatsumei* in his

20 The edict consisted of twenty-eight articles. Dajōkan fukoku 175 jō, in *Hōrei zensho,* Meiji 4 (1871) (Tokyo: Naikaku kanpōkyoku, 1912), pp. 140–141, http://dl.ndl.go.jp/info:ndljp/pid/787951.

21 The first article of the Patent Law of 1885 asserts: "Those who have invented (*hatsumei*) useful things and want to retain a monopoly of the sales of the item should submit an application for a patent to the head of Ministry of Agriculture and Commerce. If the Ministry of Agriculture and Commerce deem the patent should be given, it will grant it to the applicant." The first patent was issued on 14 August 1885 to Hotta Zuishō for his invention of a lacquer-based, anti-rust paint to be used for painting the bottoms of metal ships. Curiously, Hotta was trained initially as a lacquer artist. This seeming 'multi-tasking' of an individual artist, quite typical of the period, demonstrates that 'art' and 'art-making' operated vastly differently in the context of early Meiji. Kaneko Kōichirō, *Senbaitokkyojōrei chūshaku* (Niigata: Miyajidō, 1885), p. 2.

22 *Genrōin kaigihikki*, no. 464 published in *Genrōin kaigihikki* (Tokyo: Genrōin, 1880), pp. 65–178, especially pp. 72–74, http://dl.ndl.go.jp/info:ndljp/pid/995129.

23 The difficulties related to the demarcation of these three concepts may be illustrated with the example of the spinning machine invented by Gaun Tokimune, known at that time as *garabō*. Gaun's machine had an external handwheel to twist threads from cotton tubes onto the reels. Gaun received the highest

stamp of 1878 sheds light on the on-going and unresolved role of the patent in the emergent modernisation, and the uncertainty about what such legislation should protect, and in what manner.

The Usefulness of Timber

Let us extend the analysis of economic value articulated on and via the wood panels further. Between the failed attempt to introduce the patent law in 1871 and its implementation in 1885, the Meiji government was actively promoting another seminal project to buttress their nation-building efforts: international and domestic expositions.[24] It orchestrated a total of five Domestic Expositions for the Promotion of Industry, the first of which took place in 1877. The fact that during the first domestic exposition, over thirty per cent of the submitted items received some form of award from the organising committee attests to the eagerness of the officials to use the platform for the purpose of identifying potential economic opportunities.[25] The government was even more active in participating in exhibitions abroad. According to one account, governmental and private entities from Japan officially participated in at least nineteen international expositions between 1872 and 1885.[26] In fact, from the record kept at Koishikawa Botanical Garden, we learn that some of the Kew panels were exhibited at the 1884 Exposition Internationale d'Horticulture in St. Petersburg, Russia.[27] The fact that these objects served as carriers of values within the international exposition circuit brings us to

honour for his invention at the First Domestic Expositions for the Promotion of Industry. Because he did not have patent protection, however, many entrepreneurs copied his machine, and Gaun lived in poverty. The 1877 machine was described as *hakken* (a discovery), because it did not exist before his submission at the exposition, while a modified version, which used a pedal instead of a handwheel, is described as an "improvement." See *Komonroku,* vol. 96 (April 1885), Ministry of Agriculture and Commerce, n.p., http://www.archives.go.jp/exhibition/digital/hatsumei/contents/photo.html?m=11&ps=1&pt=5&pm=1.

24 The classic text on the history of museums and exposition in Japan is Yoshimi Shunya, *Hakurankai no seijigaku: manazashi no kindai* (Tokyo: Chūōkōron, 1992). See also Seki Hideo, *Hakubutsukan no tanjō: Machida Hisanari to Tokyo Teishitsu hakubutsukan* (Tokyo: Iwanami shoten, 2005). Shiina Noritaka offers an intriguing study of historical episodes related to the establishment of museums and expositions in *Meijihakubutsukan kotohajime* (Tokyo: Shibunkaku shuppansha, 1989). For a detailed account on the processes of constructing an image of 'Japan,' and the production of writing its histories at international and domestic expositions, see Itō Mamiko, *Meiji nihon to bankoku hakurankai* (Tokyo: Yoshikawa kōbunkan, 2008).

25 The contrasting gap between the governmental officials' and the populace's expectations for the exposition is described wittily in the sculptor Takamura Kōun's recollections of the early Meiji years. Takamura Kōun, *Bakumatsu ishin kaikodan* (Tokyo: Iwanami shoten, 1995), pp. 122–128.

26 Satō, *Modern Japanese Art,* 108.

27 Murata Hiroko, et. al., "'Meiji jūshichinen jūnigatsu Tokyo…'," pp. 213–214.

examine what types of value, according to the Meiji government, were associated with these woods. Careful consideration of the interlinked activities among the government's participation in expositions, *Useful Timbers: A Quick Reference* (1874), a governmental publication on the projected economical and material values of timber, and these wood panels lead us to the monetary and commercial profit imbued into the Kew panels.

In fact, after their successful participation at the 1873 Vienna Exposition, the government's Exhibition Bureau (Hakurankai jimukyoku) put forward a series of books through which they articulated the parameters of usefulness as an operative term that played a key role in governmental projects. At the same time, the structural configuration and thus significance of the Exhibition Bureau shifted after the Vienna Exposition, when its office was moved from the remit of the Central Council of the Ground Council of State (Dajōkan sei'in) to that of the Ministry of Education (Monbushō).

If ordinary people and the new Meiji politicians were initially perplexed by the question of how the abstract notions of patent fit into their changing society, then we might imagine that the uses of wood and its applicability as a material would not have caused a similar level of confusion. A large variety of woods had been utilised in everyday contexts for centuries, and the associated businesses of forestry and crafts had long been established and were familiar to most people. The Meiji government's push to highlight the usefulness of wood, then, was not particularly novel or inventive per se. In fact, in the last decades of the Tokugawa period, the shogun and domanial lords made concerted efforts to encourage greater attention to and appreciation for their local products to promote their economy. What distinguished the Meiji government's effort was its foregrounding of certain types of wood as 'useful' building materials for larger commercial projects, especially for export purposes.

Works by Tanaka Yoshio (1838–1916) serve as solid resources when tracing the manner of how 'useful' aspects of materials became highlighted. Tanaka was one of the most active members of the Exhibition Bureau. Before working there, he had been trained as a student of *materia medica* by Itō Keisuke, whom he met in 1856 at the age of eighteen. In 1863, Itō sent Tanaka to Edo (renamed Tokyo in 1868), to study at the Academy for Western Studies (Yōsho shirabejo). Tanaka had been a member of the Japanese delegation taking part in the Paris Exposition in 1867, selected for his familiarity with the discursive content and the challenges of *materia medica*. Another aspect of Tanaka that appealed to the selection committee was his activities regarding exhibition and collection practices in the context of the Society of One Hundred Tasters (Shōhyaku-sha), the group of *materia medica* scholars Itō

led in Owari domain.[28] He then joined the new Meiji government, most notably as a member of the Exhibition Bureau. Tanaka played a leading role in the government's participation in the 1873 Vienna Exposition, the 1876 Philadelphia Exposition, and the first Domestic Expositions for the Promotion of Industry in 1877.[29]

In November 1874, the Exhibition Bureau published *Useful Timbers: Quick Reference* (Yūyō mokuzai shōran).[30] At that time, the Bureau would have been preparing for the Philadelphia Exposition as well as the first domestic exposition, but this booklet was meant for the Japanese public. *Useful Timbers* describes one hundred trees available domestically. What characterises this book is the fact that pieces of physical elements of the timber are pasted onto each page: two slices – flat-sawn and quartersawn – of the trunk (Figure 3.3). Four years prior to the production of the wood panels now in Kew's Economic Botany Collection, *Useful Timbers* ventured to provide samples as part of a reference book. The use of physical wood in this publication is striking, especially considering the production of the wood panels.

In terms of format, *Useful Timbers* is similar to commercial sample books produced, for instance, by the textile industry.[31] It departs significantly, however, from contemporary publications on trees or plants, which relied heavily on pictorial representations in the woodblock format.[32] Especially in cases where the hue of the trunk plays a key role in distinguishing the types (for instance, in the first two entries: "*sugi* whose heartwood is red" and "*sugi* whose sapwood is white") the effectiveness of using the physical pieces, rather than pictorial representations, takes advantage of its format. The introduction to *Useful Timbers* notes the book's intentions:

> The trunk is the most useful part of the tree, from building houses and ships with large pieces to producing smaller items of utility such as desks, chairs,

28 A catalogue published for a commemorative exhibition organised in honour of Tanaka's career offers more information: Dainihon sanrinkai (ed.),*Tanaka Yoshiokun nanaroku tenrankai kinenshi* (Tokyo: Dainihon sanrinkai, 1926). For the activities of Shōhyaku-sha, see Fukuoka, *The Premise of Fidelity.*

29 Kinoshita Naoyuki, "Daigaku nankō bussankai nitsuite," in *Gakumon no arukeorojī*, http://umdb.um.u-tokyo.ac.jp/DPastExh/Publish_db/1997Archaeology/01/10700.html. Suzuki, *Kōkokatachi*, 121–123.

30 Hakurankai jimukyoku, *Yūyō mokuzai shōran* (Tokyo: Hakurankai jimukyoku, 1874). Originally founded in the second month of 1872 within the Central Council (*Sei'in*) of the Ground Council of State (*dajōkan*), the Exhibition Bureau was critical to preparing for the Vienna World Exposition. The Museum Bureau (*hakubutsukyoku*), on the other hand, was initially founded in 1871 within the Ministry of Education (*monbushō*). The Exhibition Bureau absorbed the Museum Bureau in 1873. In 1875, the Exhibition Bureau was transferred from the Ministry of Education to Home Ministry (*naimushō*), which then moved it to the Ministry of Agriculture and Commerce (*nōshōmushō*) in 1881. Suzuki, *Kōkokatachi*, Chart 1, pp. 13–14.

31 See for example, *Shoorimono shimahon shūchō*, 1872, https://dl.ndl.go.jp/pid/2541098.

32 See for example, Abe Rekisai, *Sōmoku sodategusa,* published in 1876, https://dl.ndl.go.jp/pid/1911130.

> boxes, combs, chopsticks, and abacuses. We now display a few types of trunks in our museum to show them to the public. However, it is difficult to always carry these wood samples as a tool to consider their names and utilities, even when the sample pieces are small. Therefore, we have made thin slices of many types of trunks cut horizontally and vertically and pasted them into a book format. This small booklet fits inside one's hand and includes samples of one hundred trunks. At a glance, one can know their names, the famous regions that produce these woods, and their appropriate uses.[33]

The idealised image of the general public evoked by this introduction is intriguing: it is assumed that readers would want to know the commercial uses of the trees they see as they go around their neighbourhood and villages. Although this may not be a realistic expectation, the publication clearly demonstrates the government's desire to imbue the 'useful' aspect of wood as general knowledge. The introduction also asserts didactically that, in the case of wood, the process of verifying its type was made more challenging by its sheer physicality and immobility.

The three different uses identified in *Useful Timbers* are: 1) construction of buildings; 2) construction of ships; and 3) manufacture of smaller-scale commercial products such as bowls. The significance of the 'usefulness' in the title is thus articulated: these one hundred types of trees are 'useful' to the extent that they provide the raw material for these purposes and products. The medicinal properties of these specimens do not have a place in this book. Instead, *Useful Timbers* stresses the value of wood as important industrial material, as *timber* in short, and underscores commercial use including international trade.[34]

The order in which the tree species appear in the book seems to have been determined by the prevalence of the tree and its broader variant common names. For instance, the book begins with what is designated as "*sugi* [Japanese cedar] whose heartwood is red." It is then followed by four variants of the type: "*sugi* whose sapwood is white," "*Yaku-sugi*," "*Kurobe-sugi*," and "*Jindai-sugi*." This grouping based on a broader common name allows for easy reference among the variants. The

33 Hakurankai jimukyoku, *Yūyō mokuzai shoran* (Tokyo: Hakurankai jimukyoku, 1872), https://dl.ndl.go.jp/pid/842435, n.p. The introduction further notes that the pasted pieces were taken from a tree grown in the region whose name appears first on the list of names provided on each page.

34 During the Tokugawa period, especially the nineteenth century, some of the objects included in canonical works such as *Bencao Gangmu* came to hold a significant commercial value, especially in trade relations between domains. Metals received increased attention in this regard, as the quality of minerals and metals affected the quality of farming tools. It is also essential here to underscore that the same criterion of usefulness continued to be applied to timber as late as 1889, on the occasion of the Exposition Universelle. See Maeda Kenkichi, *Nihon yūyōmokuzai hyōhon kaisetsu* (Tokyo: self-published, 1889).

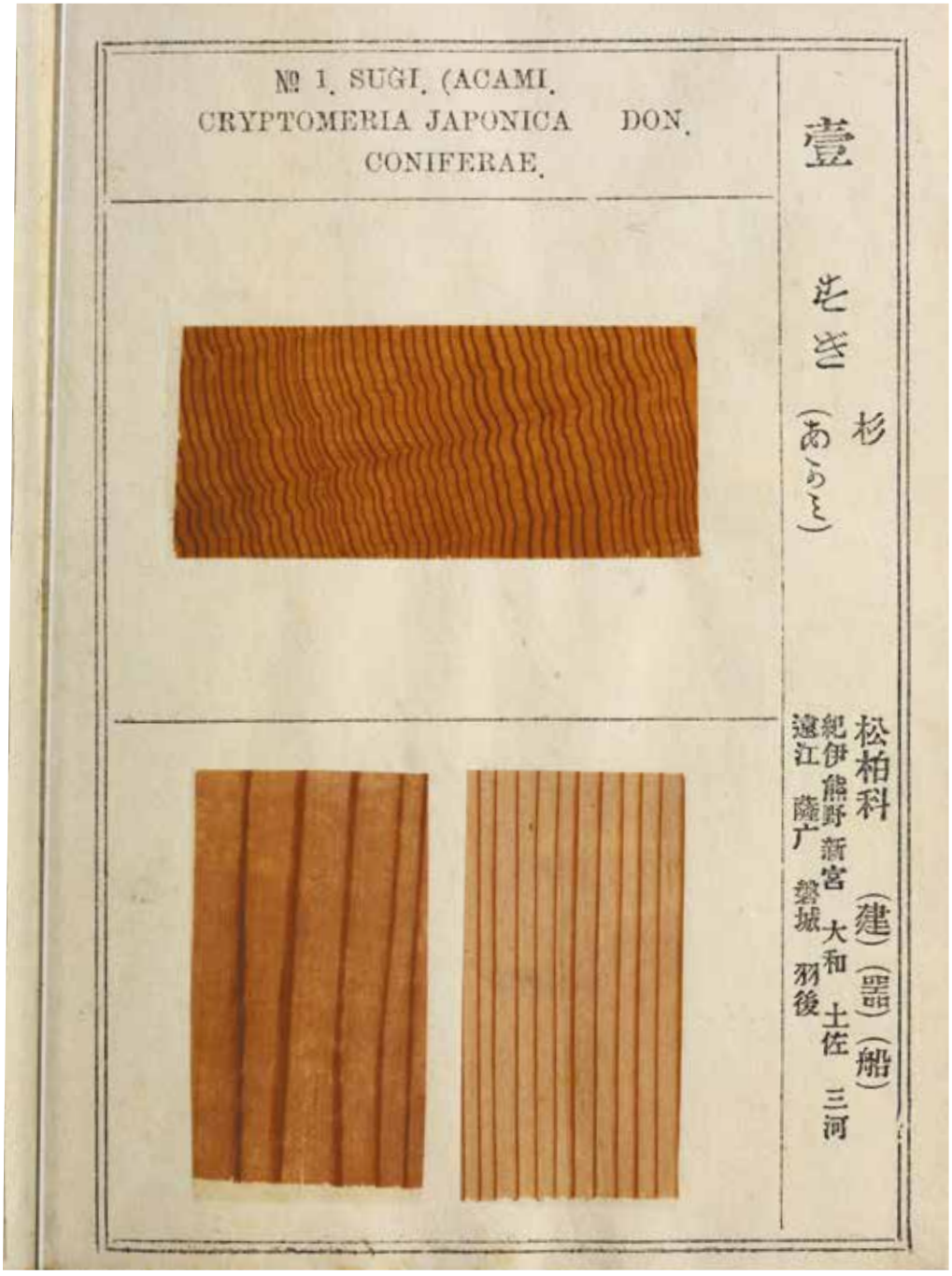

Figure 3.3: A page of Sugi (Acami) from Exhibition Bureau (Hakurankai jimukyoku), *Useful Timbers: Quick Reference* (*Yūyō mokuzai shoran)*, published in 1874, woodblock print, and glued wood segments.

access to actual texture and smell, made immediate by this format, stands in stark contrast to the transfer of knowledge based on texts and two-dimensional images. On the page for "*sugi* whose heartwood is red," the description makes clear that this type of *sugi* is useful for all three purposes. In contrast, no uses are assigned to "*sugi* whose sapwood is white." It is instead accompanied by a note, explaining that "its solidity and density are inferior to *sugi* whose heartwood is red."[35]

The trees represented in this book are treated equally in the sense that each has one page dedicated to it. Despite the simple layout, each page consists of seven components: the common Japanese name of the species in questions; its Latin binominal name; designated uses of the wood selected from the three options noted above; the broader family name of the tree in Japanese; the physical characteristics of the tree; the names of regions well-known for this particular type of tree; and the species' regional name(s).[36] By way of example, let us look at the first page "*sugi* whose heartwood is red" (Figure 3.3). On the right side of the page, the text notes, in horizontal order, a Chinese character for the numerical one, followed by the word *sugi* in cursive *hiragana* script. Under this, it inserts *sugi* in Chinese characters on the right, then the word *akami*, meaning red heartwood in cursive *hiragana* in parenthesis. At the top of the page, in horizontal order, the text is rendered in the Roman alphabet: a numerical one, then capital letters spelling SUGI. In parenthesis, it notes in capital letters ACAMI, which appears to be the romanisation of the Japanese name *akami*, as noted in the right-hand column. This is then followed by the tree's binominal name, Cryptomeria Japonica Don., then the class to which *sugi* belongs, *Coniferae*, within plant taxonomy. Returning to the right-hand column of the page, the Chinese characters grouped towards the bottom half of the page begin with *Shōhakuka*, a Japanese term that refers to evergreen trees. Under this, there are three terms, each printed within parenthesis – (architecture), (bowls), and (ships) – in horizontal order. The criteria used here are identical to the uses identified in the introduction, and the order in which these are noted seems to reflect the order in which this type of tree is most useful.

The pairing of Latin names with (a) common Japanese name(s), seems out of place at a time when very few members of the public were familiar with the Roman alphabet.[37] It does, however, reflect the somewhat overambitious intention behind this publication: that ordinary people might take up botanical explorations. In fact, the introductory note recommends another publication, *An Introduction to Botany* (Shokugaku senkai), for further study. We will return to this book in the next section.

35 Hakurankai jimukyoku, *Yūyō mokuzai,* n.p.

36 Hakurankai jimukyoku, *Yūyō mokuzai,* n.p.

37 Although this can also be understood as a rhetorical device that lends authority precisely because it deploys language remote from the general understanding of its intended readers.

A consideration of two items in the records of exhibited items in the timbers section at the First Domestic Exposition for Promotion of Industry (1877) further contextualises *Useful Timbers*. On the occasion of this first domestic exposition, Tanaka asked Itō Keisuke to serve as the leading judge for this section.[38] Needless to say, this event was one of the main projects for the Exhibition Bureau when Tanaka began to work there in 1871. Among the numerous types of *sugi* timbers and seedlings exhibited, the records mention a publication titled *Collection of Useful Plants and Their Samples* (Yūyō shokubutsu ruishū oyobi mihon) as well as one called *Framed Timber of Various Types* (Mokuzairui gaku).[39] The latter, the description informs us, can be none other than the publication we just examined: *Useful Timbers*. The description of the first publications sheds an interesting light on our inquiry:

> Plants that grow between heaven and earth offer innumerable uses. There is not a single object that does not contain some plant elements, from clothing, food, and the building of houses, ships, and wheels, to various types of utensils and items for storage. However, if people were asked to evaluate the qualities of wood, they are unable to understand its characteristics and develop its unknown potentialities. Therefore, we collected outstanding examples of plants that are widely used today. We called them *Collection of Useful Plants*, placed them into categories, and added their Japanese, Chinese, and Western names. We are now also selling samples of these useful plants so that everyone can collect these small pieces and have them to hand.[40]

The rationale for making these samples available for purchase clearly overlaps with the intentions of *Useful Timbers.* The Exposition Bureau's driving idea must have been that educating people about the uses and names of various trees was the first order of business. Names, naming, classifications, and an awareness of the variant appearances of trees were seen as part of this learning process. Publications such as *Useful Timbers,* as well as the samples that were sold at the Exposition, were solutions to overcome impediments to the Bureau's enlightening mission. Although no definitive record has so far been found, it makes historical and material sense that wood panels such as the ones now kept at Kew had their origin in *Collection of Useful Plants and Their Samples*.

38 To be exact, the section of timbers belonged to the larger department of Agriculture. Itō Keisuke also served as a chief judge for the Gardening Department, see Sugimoto Isao, *Itō Keisuke* (Tokyo: Yoshikawa kōbunkan, 1960), p. 250.

39 In *Meiji jūnen naikoku kangyōhakurankai shuppinkaisetsu jumoku*, reprinted in Fujiwara *Meiji zenki*, p. 51.

40 Fujiwara, *Meiji zenki,* p. 51.

Indeed, from the diaries of Itō Keisuke, we learn that Itō asked Katō to produce at least 160 wood panels. Of them, at least fifty panels were purchased by Katō Hiroyuki, the president of the Department of Science, Law, and Letters at the University of Tokyo, for fifty yen, which equates to one yen per panel.[41] To give a sense of the economic value attached to the panel, the cost of a portrait photograph using the collodion process, which was becoming a popular commodity, was about one seventh of one yen or fifteen *sen*. This cost amounts to the average daily wage of a male farmer. In other words, each of the wood panels was expensive, amounting to seven working days of farming labour.[42] The sale of 160 of them, therefore, accrued a considerable amount of income.

The relationship between the publication *Useful Timbers,* the material form provided by the wood panels, and the exposition activities further underscore the political significance the government placed on orchestrating expositions and exhibitions. Here, the relationship between the thoughts of Fukuzawa Yukichi, who did not hold a political appointment in the government, and the way governmental officials reappropriated Fukuzawa's articulation of usefulness in their practice warrants attention. Most significantly and unsurprisingly, Fukuzawa Yukichi deployed the concept of 'usefulness' in explicating the role of expositions in his *Conditions in the West* (Seiyo jijō). In volume one, he focuses on the exhibition infrastructure found in 'the West,' including various types of museums as well as world expositions. In describing the motivations for hosting expositions, he notes:

> As described in the previous entry on "museums," each country establishes museums that collect articles, old and new, from around the world. However, the arts and crafts of each nation (*kuni*) develop daily, and new inventions (*hatsumei*) follow. There is always something new. For this reason, it often happens that what was considered a rare and precious item in the past is seen as stale today, and that yesterday's clever item becomes useless today. Therefore, in metropolitan cities of the West, they organise an assembly of products from each nation to gather notable products, useful instruments, old and rare items through a notification, and show these to people from around the world. These are called expositions.[43]

41 Itō's request was made between 2 and 22 June 1878. Murata et. al, "'Meiji jūshichinen jūnigatsu…'," pp. 214–216.

42 Based on Itō's diary entries, some scholars assert that the production of the wood panels was overseen by Katō who managed several artisans, as it would be challenging to produce such a number by himself. See Nagata et. al, "An Unusual Xylotheque," p. 95.

43 Fukuzawa Yukichi, *Seiyo jijō* (Tokyo: Hayashi Yoshibe, 1868), http://dl.ndl.go.jp/info:ndljp/pid/993191, pp. 42–43. Kume Kunitake, a member of another delegation, sent to the US and Europe in 1871, made similar observations when describing the Vienna Exposition. He imagines "benefit" (*rieki*) as something

One of the urgent motivations for hosting an exposition, according to this text, is to publicly update and confirm the status of exhibited items as either useful or useless. Fukuzawa's repeated use of the word 'nation' re-inscribes his view of the nation as the primary beneficiary of 'useful items.' This useful-useless dichotomy applied to articles is precisely what the government deployed in dealing with the broader material and visual culture of early Meiji Japan.[44] Meiji politicians, in fact, steadily amplified Fukuzawa's perspective on the purpose of expositions. Major governmental bureaucrats such as Okubo Toshimichi, Sano Tsunetami, and Machida Hisanari, adapted the educational power of public showings, such as exhibitions and expositions, as a suitable platform for the transfer of knowledge and values. Similarly, they did not question the view that international expositions and museums served the 'civilisational' role of strengthening national wealth and its competitive position in broader international trade networks.

As mentioned earlier, timber had played a central role as a construction material for centuries, and thus its usefulness was indisputable. What was novel in the Meiji period was the governmental effort to articulate to whom and how usefulness was defined. Namely, the government made a concerted effort to assert that particular types of timber were useful for the export business and the government to achieve their political vision for the new nation. In this light, the dissemination of knowledge concerning the commercial potential of timber became a matter of urgency. That all but two of twenty-six panels at Kew are included in *Useful Timbers*, therefore, carries a particular economic significance for the government.[45] That is, when Koishikawa Botanical Garden produced the wood panels in 1878, the Exhibition Bureau had already identified these selected types of wood as raw materials that could bring trade profits. It is telling that in the report of the First Domestic Exposition for the Promotion of Industry, Gottfried Wagner, an advisor to the government committee,

that should trickle down from nation to individuals, with an emphasis on material wealth. Quoted in Yoshimi, *Hakurankai*, 118.

44 This proved particularly decisive in reconfigurations of antiquarianism and the establishment of art history. For a detailed study on the activities of antiquarians around this period, see Suzuki, *Kōkokatachi*. Kinoshita Naoyuki takes the treatment of stone axes in various survey publications on 'art history' in Japan to demonstrate compellingly that the concept of 'use' played a significant role in excluding or including objects from the discourse. In particular, he points to a speech by Imaizumi Yūsaku at the Dragon Pond Association in 1884, in which Imaizumi deployed the concept of 'use' as the definitive criterion to distinguish between fine art and antiques. See Kinoshita Naoyuki, "Nihon bijutsu no hajimari," in *Yonotochūkara kakusareteirukoto*, p. 330. Also see Satō, *Modern Japanese Art*, especially Chapter 3 "Art and Economics." Takagi Hiroshi offers analyses on the issue of periodisation of 'Japanese Art History' in "Nihon bijutushi no seiritsu shiron," in *Nihonshi kenkyū*, vol. 400 (1995): 74–98.

45 The two exceptions are: *nikkei* (cinnamon), and *saikachi* (honey locust, *Gleditsia japonica*).

recommended refocusing on the timber industry, rather than on the export of timber, because of exorbitant shipping costs.[46]

Furthermore, Koishikawa Botanical Garden also incorporated the category of "useful timbers (*yūyō mokuzai*)" for the basic cataloguing of items at the site. The category appeared for the first time in 1875, three years prior to the production of the wood panels, and lists twenty-four items. The category then is deployed every year in their practice until 1882, when the term "useful timbers" was replaced with "*timber samples* (*mokuzai hyōhon*)."[47] In other words, the urgency of asserting the idea of usefulness was not only targeting the general population. The Botanical Garden itself relied on the concept and the value associated with it to concentrate on timber as a resource worthy of *their* attention. In view of the seven-fold increase in the numbers recorded under the category of "useful timbers" – from twenty-four in 1875 to 170 in 1879, the institutional and governmental attention and labour that went into the articulation of "useful timbers" must have been extraordinarily intense.

It would, moreover, be misleading and premature to characterise the motivations for producing the wood panels as exclusively economic and commercial. As noted in the introduction, there were two major constitutive forces at Koishikawa Botanical Garden and associates such as Itō Keisuke and Tanaka Yoshio. Let us turn to the publications on the *nomenclature* of trees by Itō and Tanaka to analyse the localised yet forceful epistemic negotiations taking place within the specialist study of trees.

Epistemological Stakes on the Trees

Today, *botanical garden* (*shokubutsuen*) is a familiar term. But at the time of the Meiji Restoration, no sites called *shokubutsuen* existed yet, and the process by which Koishikawa Botanical Garden became known as such further illuminates the circumstances of the production of the Kew panels and the values prescribed to them.

Established in 1711 as a medicinal garden for the Tokugawa shogunate, its primary function was to cultivate plants to be used in the preparation of medicine in the manner taught in *materia medica*. Following the 1868 restoration, the garden went through various hands. In 1877, the garden became part of the newly established

46 Gottfried Wagner, Asami Tadamasa trans., *Meiji jūnen naikoku kangyō hakurankai hōkokusho* (Tokyo: Naikoku kangyō hakurankai, 1877), p. 64, https://dl.ndl.go.jp/pid/801863. Wagner served as an advisor to the Administrative Office for the 1873 Vienna Exposition, and the 1876 Philadelphia Exposition. "Dokutoru Wagunerushi den," in Tanaka Yoshio, Hirayama Narinobu, *Ōkokuhakurankai sandō kiyō* (Tokyo: Moriyama Shunyō, 1897), pp. 53–72, https://dl.ndl.go.jp/pid/801730. "Waguneru-den," in Dainihon yōgyōkyōkai, *Nihon kinsei yōgyōshi* (Tokyo: Dainihon yōgyōkyōkai, 1922), pp. 1500–1502, https://dl.ndl.go.jp/pid/970706.

47 Murata et. al, "'Meiji jūshichinen jūnigatsu…'," pp. 240–246.

University of Tokyo.[48] Before that, between 1868 and 1877, the garden was known as *Koishikawa Yakuen*, roughly translated as Medicinal-Herb Garden in Koishikawa.[49] It was placed under the administrative responsibility of the Bureau of Local Products (Bussankyoku), an office under the Ministry of Education.

When the garden was reassigned to the Department of Science (Rigakubu) of the University of Tokyo in 1877, disagreement within the university persisted over whether the medical school would be its appropriate affiliation.[50] This debate was largely the result of the prevailing historical association of plants with *materia medica,* and the centrality of herbal remedies in medical practice. The wood panels, thus, are embedded within these shifts in overarching goals involving the government as well as the structure of a 'university,' government's central institution to disseminate and refine knowledge. Knowledge of trees at Koishikawa Garden was purposed for two distinct goals: the first fundamentally as an extension of medicinal uses, and the second as a significant resource for nation-building. At first sight, Itō's position at the Garden appears to be uncertain. Morse's comment in 1878 that these wood panels were wonderful teaching tools of *botany* thus need to be situated within this discursive and epistemic instability.

Itō began his official affiliation with Koishikawa Botanical Garden in 1875.[51] At that time, he was seventy-two years old.[52] His first publication during his tenure was in 1877, the year the garden became part of the University of Tokyo. Titled in

48 The University was founded in 1877 by merging two pre-existing schools: Tokyo Medical School (Tokyo igakkō) and East School of Daigaku (Daigaku higashikō), and Tokyo Kaisei School (Tokyo *Kaisei* gakkō). In 1885, the university absorbed the Tokyo Law School (Tokyo hōgakkō), which was administered by the Ministry of Justice, and the Technical Art College (Kōbu daigakkō), which was administered by the Ministry of Technology, to re-establish itself as a general university known as the Imperial University (Teikoku daigaku) in 1886.

49 During the Tokugawa period, the same garden was known as the Koishikawa Goyakuen (roughly translated as the Shogunal medicinal-herb garden in Koishikawa). In the early years of the Meiji period, the honorary prefix '*go,*' which indicates the affiliation with the shogunal family, was dropped. In Itō Keisuke's brief history of the garden, he notes that, in 1868, the administrative body of the garden shifted from the shogunal to the city of Tokyo, specifically its hospital under the name *goyaku'en*. In 1869, the garden was called the medicinal-herb garden of the Medical School (Igakukō yakuen) when it was absorbed by the Tokyo Medical School. The Ministry of Education then absorbed the garden in the seventh month of 1871, and, three months later, it was jointly administered by the Exposition Bureau under the name Koishikawa shokubutsu'en. Itō Keisuke, "additional notes (*fuki*)," in *Catalogue of Plants in Koishikawa Botanical Garden* (Tokyo: University of Tokyo, 1879), vol. 2, p. 1.

50 Oba Hideaki, "Nihon no honzōgaku no ayumi to koishikawayakuen no rekishi," in Oba Hideaki ed., *Nihon shokubutsukenkyū no rekishi: Koishikawashokubutsuen sanbyakunen no ayumi* (Tokyo: University of Tokyo Museum, 1996), pp. 21–49.

51 For details regarding Itō's appointment, see Sugimoto, *Itō Keisuke*, pp. 225–233. The changes in his affiliations demonstrate the complexity of untangling and regrouping pre-existing disciplinary and institutional practices that took place in the early Meiji period on a governmental level.

52 By the time Itō joined the garden, moreover, the subject of his expertise, *materia medica*, had become the official responsibility of the Bureau of Local Products (Bussankyoku). In other words, the Meiji

English as *Catalogue of Plants in Koishikawa Botanical Garden*, it listed the plants grown at the garden in Chinese, locally known Japanese, and Latin binominal names. This two-volume publication includes only textual descriptions. Four years later, in 1881, Itō published the three-volume *Figures and Descriptions of Plants in Koishikawa Botanical Garden* with illustrations by Katō Chikusai. It is an expanded, illustrated version of the 1877 catalogue with additional regional names, and descriptions that include histories of how the plant came to the garden, observations on its growth, and medicinal uses. The production date of the Kew wood panels thus falls between these two publications. Through cross-referencing, we learn that all twenty-six kinds of wood represented in the panels were growing in the Koishikawa at the time of their production.

In these attempts to disseminate knowledge of plants, Itō maintained an unwavering methodological approach: he began with plants he had direct physical access to. He then identified the plant by providing its name(s) in local variants, its name(s) as listed in canonical books on *materia medica* in Chinese and Japanese, and its Latin binominal name(s), often directly asserting the impossibility of knowing all names and their variants. In the introductions to both the 1877 and the 1881 catalogue, Itō lamented the confusion caused by names and naming, claiming that one of the intentions of these publications was to "make it as clear as day (*ichimoku ryōzen*)."[53] In the *Catalogue of Plants in Koishikawa Botanical Garden*, he named his sources for the Latin names, referring to the Swiss scholar Augustin Pyramus de Condolles, the Dutch botanist Cornelis Antonie Jan Abraham Oudemans, the German naturalist Philip Franz von Siebold, and the French botanist Paul Amédée Ludovic Savatier, emphasising the divided state of botanical nomenclature. In *Figures and Descriptions of Plants in Koishikawa Botanical Garden*, Itō noted "although I consulted scholars such as German Philip von Siebold and French Savatier, often we invent new names, or hear new theories that necessitate the modification of names. Therefore, we must keep editing these names."[54] Curiously, in the introduction to the 1881 catalogue, he also asserted, self-reflectively, the impossibility of reaching anything approaching perfection in accumulating botanical knowledge, given the uneven and fragmented condition under which knowledge about plants

government had recognised the economic potential of *materia medica*, which, until then, had been primarily a subject for medical professionals.

53 Tokio Daigaku, *Catalogue of Plants in Koishikawa Botanical Garden* (Tokyo: Scientific Department of Tokio Daigaku, 1877), vol. 1, n.p., https://dl.ndl.go.jp/pid/832378; and University of Tokyo ed., *Tokyo Daigaku Koishikawa Shokubutsuen sōmoku zusetsu* (Tokyo: Maruzen, 1886), vol. 1, Kato's name appears on the bottom left corner outside the frame of illustration, which is magnolia on page 21, https://dl.ndl.go.jp/info:ndljp/pid/832374.

54 Itō Keisuke, "hanrei" in University of Tokyo ed., *Tokyo Daigaku Koishikawa Shokubutsuen*, vol. 1, n.p., https://dl.ndl.go.jp/pid/832374.

becomes accessible.[55] A historical description such as this gives an insight into the ongoing and concomitant roles *materia medica* and *botany*, or *honzōgaku* and *shokubutsugaku*, played in the minds of Itō and, more broadly, within the process of knowledge production at Koishikawa Garden.

The increasing scale and scope of the above-mentioned publications – from a simple list of names in 1877 to a detailed and elaborate compilation in 1881 – is typical for Itō's long career. As he himself developed from a physician trained in Chinese medicine to a scholar of *materia medica*, and finally to a specially appointed Professor (*Rigakubu ingaikyōju*) at the University of Tokyo in 1881, his approach to the accumulation of knowledge remained steadfast and resolute.[56] Itō actively took part in the tidal transformation around and for the study of plants – modifying the discursive framework from *materia medica* that originated in China, to *botany* built upon the European taxonomic systems – through his recursive study of the systems of nomenclature. While this epistemic shift led to further inquiries and questioning among scholars of *materia medica*, it also necessitated coming to terms with taxonomic disputes among *botanical* scholars. The epistemic debate documented in the publications included in this chapter, therefore, not only took place between *materia medica* and *botany*, but also considered disagreements within the field of botanical science as discussed below.

Indeed, the structured method attested in Itō's *Figures and Descriptions of Plants in Koishikawa Botanical Garden* parallels his work back in Nagoya when he led the Society of One Hundred Tasters for four decades.[57] While the government increasingly came to see timber as a resource for international trade, Itō's own approach to the study of plants did not change radically to conform to this shift in official attitude. In other words, his systematic exploration of plants did not become irrelevant or, more to the point, "useless" by the broader change in the

55 According to Itō, this is the case even if one continuously revises and modifies their knowledge. In this context, he mentions the numerous regional names, the plants that did not survive even when acquired by the Koishikawa Botanical Garden because of their temperament, and the vast number of plants that grow in inaccessible areas. University of Tokyo ed., *Tokyo Daigaku Koishikawa Shokubutsuen*, n.p.

56 Because Itō was already working for the Garden in 1875, his new appointment at the University of Tokyo when the Garden was absorbed to the University enabled him to oversee the operations and research at the Garden. Although the title of professor implies a teaching component, it is important to underscore here that Itō did not teach botany at the university. At this time, the subject of *botany* was taught at higher education level at the Hitotsubashi University, taught by Yatabe Ryōkichi. Sugimoto, *Itō Keisuke*, pp. 243–244.

57 Itō began his pursuit of *materia medica* in Owari by following up on his teacher Mizutani Hōbun's work *Clarification on the Names of Things* (1809). Itō's *Nominal Differentiations in Western Materia Medica* published in 1829 expanded Mizutani's work with the application of the Linnaean binomial system. Itō then began to compile albums of local plants, which included ink rubbings, cut-outs of woodblock printed illustrations from other publications, as well as his own sketches. See my book, *The Premise of Fidelity,* especially Chapter 2, "Ways of Conceptualizing the Real: Scripts, Names and *Materia Medica*."

direction of governmental interest. His two publications for Koishikawa Botanical Garden and the wood panels at Kew, therefore, demonstrate his continued practice of privileging the availability of plants first and foremost.

While it is difficult to ascertain whether the Kew panels were produced from the actual trees grown in Koishikawa Botanical Garden, the direct link between their access and the panels suggests that one of the purposes of these panels was to physically corroborate the breadth of plants growing at Koishikawa Botanical Garden.[58] Here, the demonstrative purpose of the panels comes to the fore. These panels were more than a list of plants: as a set of objects, they embodied their immediate availability in the garden. As a group, they represented a botanical garden in Tokyo.

Tanaka Yoshio's study on wood and taxonomy around this time provides further evidence for the scrutiny of received knowledge within Koishikawa Botanical Garden. In 1872, Tanaka published two charts: *Taxonomy of Plants according to Linnaeus* (Rinnashi shokubutsu kōmōhyō) and *Taxonomy of Plants according to de Candolle* (Dekandorureshi shokubutsu shizen bunkahyō).[59] They were both published by the Museum Bureau (Hakubutsu kyoku), separated by two months.[60] Both charts were foldable to a portable size, suggesting that Tanaka meant them to be taken on excursions, similarly to *Useful Timbers*.

Augustin Pyramus de Candolle's taxonomic classification, published in *Prodromus Systematis Naturalis Regni Vegetabilis* (1824–1872), challenged the established and accepted Linnaean binominal nomenclature based entirely on the numbers of (or lack of) plants' sexual organs – pistil and stamen. Because de Candolle's taxonomy deployed the concept of homology, the number of families, a category one class above genus in the Linnaean system, expanded. This shift in structure brought further complications to the discourse of botanical taxonomy.[61] In fact, Itō was aware of de Candolle's nomenclature, as he referenced it in his 1829 publication, *Nominal Differentiations in Western Materia Medica* (Taisei honzō meiso). Having studied under Itō, Tanaka was not new to the recursive problems of naming and

58 Itō Keisuke begins his "explanatory notes" (*hanrei*) in 1881 *Tokyo Daigaku Koishikawa Shokubutsuen sōmoku zusetsu* by elaborating on the difficulty of names and naming. Of the ten items listed on this note, five delve into issues of names. Itō Keisuke, "*hanrei*," in *Tokyo Daigaku Koishikawa Shokubutsuen*, n.p.

59 Tanaka's translation of de Candolle's system is said to be based on the 1844 edition of *Prodromus Systematis Naturalis Regni Vegetabilis*. Ueno Masuzō, *Nihon hakubutsu gakushi* (Tokyo: Kōdansha, 1989), p. 194.

60 *Rinnashi shokubutsu kōmōhyō* was published in the eighth month, and *Dekandorureshi shokubutsu shizen bunkahyō* in the tenth month. They are both available online at the digital collection of the National Diet Library.

61 The number of families expanded to 213 via de Candolle's system. For an overview of the ramifications of de Candolle's system for the issues of Latin naming, see Dan H. Nicholson, "A History of Botanical Nomenclature," in *Annals of Missouri Botanical Garden*, vol. 78, no.1 (1991): 33–56.

nomenclature. In other words, Tanaka's two taxonomic charts of 1872 served to extend and elaborate on existing nominal concerns that had been shared with figures such as his teacher Itō.

To his own copy of *Taxonomy of Woods according to de Candolle*, now at the National Diet Library in Tokyo, Tanaka added a brief handwritten text explaining his reasons for studying and disseminating this taxonomic system. Perhaps unsurprisingly, here, too, he identified the problem of naming.

> I published a Candollean chart and a Linnaean chart in 1872 [...] The number of available names in classical Chinese is already limited. In recent years, we have been following the names in both classic texts of *materia medica* as well as those published in the Qing dynasty. When a plant lacked a name, we concocted a new translated name [in Japanese]. When the family name was absent in Chinese, we used the name of a plant belonging to that family for the family name. When there were no names available in either classical or Qing texts, we used a Japanese name in this chart.[62]

This note reveals that the matching of the names of plants in various texts and languages continued to be a real challenge for Tanaka and those pursuing knowledge of plants, including trees. Most importantly, Tanaka's effort was directed at aligning various linguistic expressions to facilitate and smoothen the process of identifying his local plants. On this level of methodological concern, Tanaka's motivation matched that of his teacher, Itō.

Just a year after the publication of Tanaka's two charts, the Ministry of Education published *An Introduction to Botany* (Shokugaku senkai). Here, the basic botanical understanding was framed by and through de Candolle's nomenclature. The epistemic negotiations between Candollean and Linnaean systems, therefore, were settled in favour of the former in the context of Meiji education. As a consultant for this publication, Tanaka modelled the Ministry's publication on a textbook by the English botanist John Lindley (1799–1865), *School Botany, and Vegetable Physiology, or The Rudiments of Botanical Science* published in 1860.[63] *An Introduction to Botany* presented Lindley's approach by explaining the fundamental categories based on the shapes of root, stem, bud, leaf, flower, calyx, corolla, stamen, pistil, fruit, and seed. Katō Chikusai was the illustrator for this publication.

62 Augustin Pyramus de Candolle, Tanaka Yoshio trans., *Dekandorureshi shokubutsu shizen bunkahyō* (Tokyo: Monbushō hakubutsukyoku, 1872), https://dl.ndl.go.jp/pid/2543093. Writing in red ink, Tanaka added this text three years after the initial publication.

63 Lindley's textbook is mentioned in the introductory remarks to Ono Motoyoshi trans. *Shokugaku yakusen* (Tokyo: Ministry of Education, 1874), n.p., https://dl.ndl.go.jp/pid/832409.

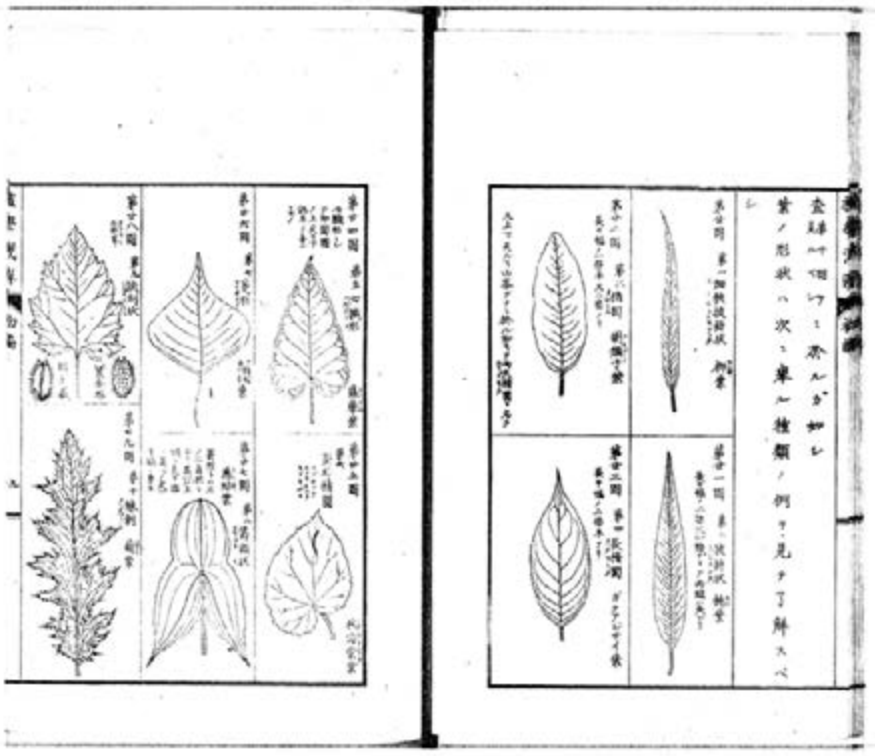

Figure 3.4: A page demonstrating different shapes of leaves in Ono Motoyoshi, Kubo Hiromichi eds., *An Introduction to Botany* (*Shokugaku senkai*), (Tokyo: Ministry of Education, 1875), p. 9.

Tanaka and his team performed a major intervention in this publication. Instead of passively copying the pictorial examples of abstract forms in Lindley's text, Tanaka's team deliberately mobilised specific domestic plants to exemplify the forms by adding the common Japanese names of domestic plants. That is, this publication concretised the categories through specific domestically available plants.[64] For example, in differentiating the shapes of leaves such as oblong and sinuated in Lindley's text, Tanaka's team used the same abstracted pictures of the leaves, asserted common names, lacecap hydrangea (*gaku ajisai*) and cocklebur (*onamomi*), respectively, to demonstrate the differences specifically through their local examples (Figure 3.4).

64 Ono Motoyoshi trans, Kubo Hiromichi ed., and Tanaka Yoshio consultant, *Shokugaku senkai* (Tokyo: Ministry of Education, 1875), n.p. https://dl.ndl.go.jp/pid/832406. When the illustration was a copy from Lindley's book, it was accompanied by a phrase, "in the original." This book was to be paired with the "terms book" or *Shokugaku yakusen* published in 1874.

The introduction to *Useful Timbers* of 1874 made the point that it used de Candolle's taxonomy to frame its body of knowledge and that further information on Candollean nomenclature was available in *An Introduction to Botany*. Here, a recursive and discursive set of texts emerges, in which Itō Keisuke and Tanaka Yoshio had direct leading roles to play. In all publications – *Taxonomy of Plants according to Linnaeus* (1872), *Taxonomy of Plants according to de Candolle* (1872), *An Introduction to Botany* (1873), *Useful Timbers* (1874), *Catalogue of Plants in Koishikawa Botanical Garden* (1877), and *Figures and Descriptions of Plants in Koishikawa Botanical Garden* (1881) – a decisive gesture was made to establish a direct and firm relationship of fidelity among the locally available trees and their various names. The relationship had economic, botanical, and educational ramifications. In the case of *Useful Timbers,* the inclusion of physical pieces of timber was intended to encourage readers to bridge the gap between the actual structure and the represented knowledge on the page. At the same time, the deployment of de Candolle's nomenclature in this book signalled, for the Ministry of Education, and Itō and Tanaka especially, an epistemic experiment.

As if to further their exploration, the Ministry of Education published a series of pedagogical charts to be used in elementary schools a year later, in 1876. One of them is titled *Hakubutsufu daiichizu* or *Chart of Plants 1*, and here, too, de Candolle's nomenclature is illustrated using local examples (Figures 3.5 and 3.6). Printed in copper-etching and coloured in woodblock, the chart names Katō as illustrator.[65] Katō evidently traced and reused illustrations from *An Introduction to Botany* for this coloured chart (Figure 3.4). These repeated efforts to provide local examples and names to explain de Candolle's nomenclature bring another different dimension to the idea of usefulness.

For example, in the Linnaean nomenclature, according to Itō, the tree commonly known in Japan as *sugi* is rendered *Cupressus Japonica* Linn. In de Candolle's nomenclature, according to Tanaka's 1872 chart, it is rendered *Cryptomeria Japonica* due to further differentiation in the category of family. On the Kew panel, it is identified as *Cryptomeria japonica*, Don. A common tree known as *kusunoki* in Japanese was identified with two binominal names by Itō in 1829: *Laurus Champhora* Linn: and *Cinnamomum Camphora* Sieb. In Tanaka's *Useful Timbers* it is noted as *Cinnamomum Camphora* Fr. On the Kew panel, its Latin name is rendered *Cinnamomum camphora*.

Nominal Differentiations in Western Materia Medica (1829), *Useful Timbers* (1874), and the twenty-six wood panels at Kew have twenty trees in common. All the names of these twenty trees are rendered differently in Itō's 1829 *Nominal Differentiations*

65 The format of the charts is said to be based on the series published by N. Wilson and N.A. Kalkin's *School and Family Charts*.

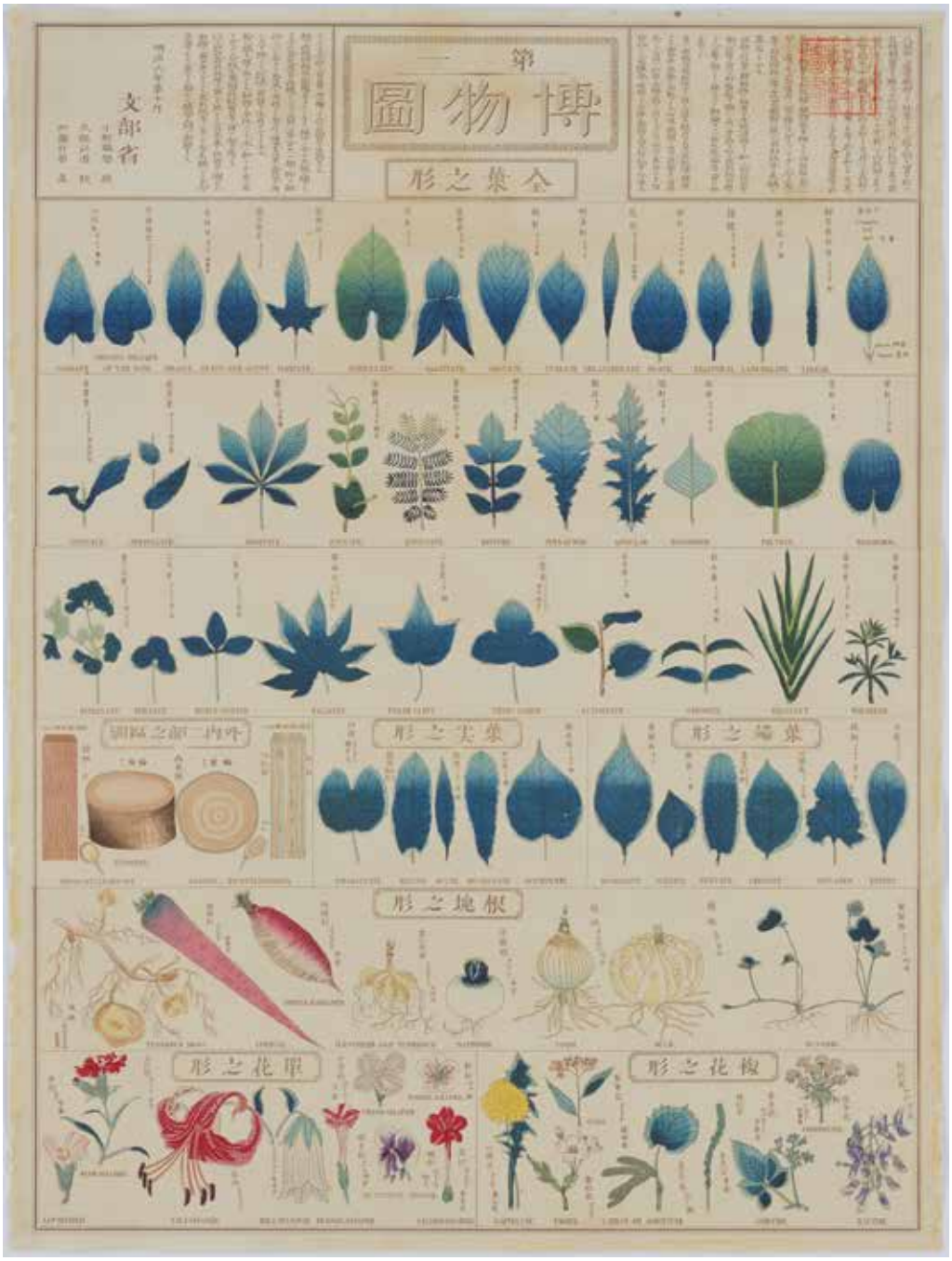

Figure 3.5: Ministry of Education, *Chart of Plants 1* (*Hakubutsufu daiichizu*) 1876. copper-printing with woodblock colours. 58 cm x 81 cm.

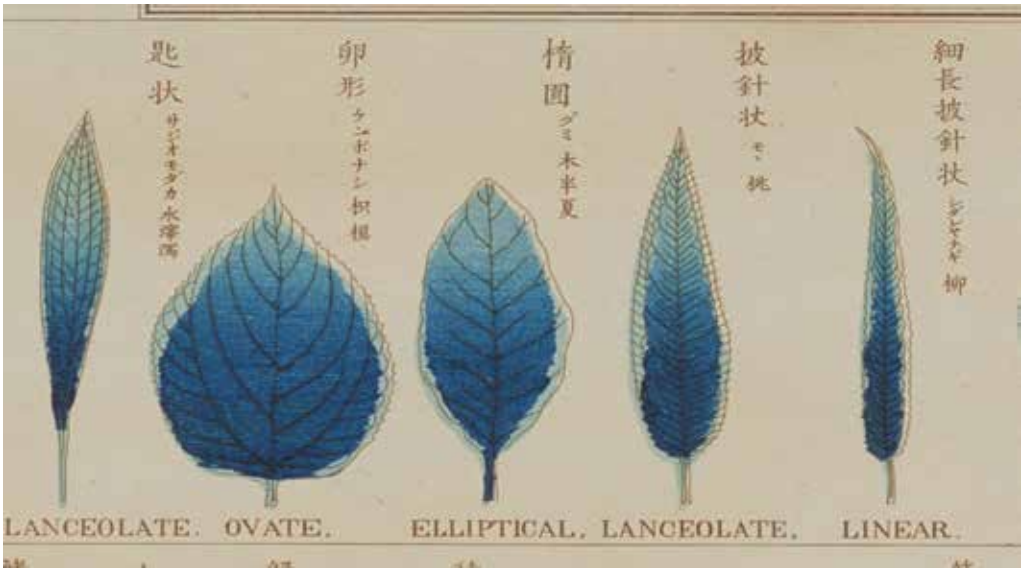

Figure 3.6: Close-up of Figure 3.5, *Chart of Plants 1 (Hakubutsufu daiichizu)* 1876.

in Western Materia Medica and Tanaka's 1874 *Useful Timber*. Here, we come to see how the stakes of knowledge production and application played out through and around the wood panels. They do not merely function as a confirmatory device of the trees' existence within the Botanical Garden, but likewise serve to discuss and correct the given binominal names. Against the background of the government's ideas about the export of timber products as a nation-building project, Tanaka and Itō were also faced with a different challenge, shaped by their desire to align and consolidate various nomenclatures with the available trees in Tokyo, in their Botanical Garden.

Such historical probing and intellectual investment are overlooked when we blindly rely on the putative idea of *botany* and see these objects as supporting evidence for their "accurate" transfer to Japan. As carriers of a particular body of knowledge consisting of physical parts, corresponding pictorial elements, and the assigned names, these panels served as intermediaries to verify nomenclature. The insights gained from their creation in turn contributed to the further production of knowledge. Here, the issue is neither "enlightenment" or "civilisation," as imagined by Fukuzawa and Meiji politicians who developed his ideas in practice, nor economic interest. Naming, un-naming, and re-naming, a familiar approach to the study of plants, involved Tanaka and Itō in an ongoing epistemic process. The Koishikawa Botanical Garden served as a laboratory for never-ending experiments with nomenclature and taxonomy.

What is Inventive About the Wood Panels?

What, then, can we make of Katō's red stamp that declared "1878, the latest invention by Katō Chikusai"? In the context of the emerging political and economic interest in identifying and profiting from natural resources, the Kew panels reveal themselves as a set of objects that served several different purposes.

In their portable and stackable format, the panels can be collected as a reference guide with samples of "useful plants." When situated in the context of international and domestic expositions, the panels as a group materially represent the variety of trees in Koishikawa Botanical Garden. The Exhibition Bureau saw the panels as a commodity for the education of the general public. Compared to *Useful Timbers*, which took the equally portable and stackable form of the published book, the wood panels were able to carry –literally and materially – more information such as the textures of the bark and the illustrations of its flowers and fruits. The wood panels also served as a mediating device with which the ascribed binominal names could be challenged, modified, or at least discussed by giving immediate and direct access to the visual appearance, scent, and texture of the tree in question.

In comparison to *Useful Timbers,* the newness suggested by the phrase "the latest invention" gestures towards an improved and more efficient format to present a body of knowledge. Given the collaboration of the Museum Bureau, Exhibition Bureau, and the Koishikawa Botanical Garden, and the personal relationship between Tanaka Yoshio and Itō Keisuke, *Useful Timbers* and the panels share the intention to educate the public and to create a modality of learning to acquaint it with the physical aspect of a tree. Juxtaposing these two formats of knowledge transfer, it is possible to view the panels as an improved version of *Useful Timbers*. While it is speculative, given the fact that Tanaka participated in the governmental discussions on the issue of patent law, it would not be surprising if he regarded the panels as a potential case study to concretise matters.

At the same time, from the Koishikawa Botanical Garden perspective, the panels served to address a different set of concerns. For Itō and Tanaka, they were an efficient device to display and discuss Latin names, and, as such, offered a valuable tool in the ongoing process of refining nomenclature, even more so because they focused on plants whose Latin names had changed since Itō's 1829 publication.

The fact that Katō Chikusai supplied illustrations for *An Introduction to Botany, Figures and Descriptions of Plants in Koishikawa Botanical Garden*, and the elementary school chart, *An introduction to botany* as well as for the panels also points to the extent of Katō's own knowledge about trees and botanical nomenclature. The novelty of Katō's "invention" was the combination of text (in various forms and scripts), image, and sample – a format that departed from the pictorial work he had produced for Itō and Tanaka.

As a way of concluding, let us return to the disciplinarity of the Kew panels as objects. Upon considering motivations in production, a sense of unruliness emerges from the co-existence of multiple values within and around these objects. As a group of objects, they disrupt the methodological assumptions that constitute modern subject areas, such as botany and art history. They ask us to suspend our habits of disciplinary contextualisation. On one level, the objects' value is in their function as a teaching tool: they served as a conduit to transfer a particular kind of knowledge. On another level, they helped to identify useful and therefore lucrative natural resources. On yet another level, the same objects also benefited the lives of Itō and Katō, both financially and intellectually. Acting in defiance of modern disciplines, boundaries, and definitions, these objects are ill-disciplined.

Glossary

Katō Chikusai (1818–1886)	加藤竹斎
Itō Keisuke (1803–1901)	伊藤圭介
Koishikawa	小石川
materia medica (J: *honzō*, Ch: *bencao*)	本草
Hakubutsufu daiichizu	博物譜第一図
Honzōgaku	本草学
Shokubutsugaku	植物学
Takahashi Korekiyo (1854–1936)	高橋是清
tokkyokyoku	特許局
hatsumei	発明
hakken	発見
Tanaka Yoshio (1838–1916)	田中芳男
Yūyōmokuzai shōran	有用木材捷覧
Shokugaku senkai	植学浅解

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