

# An Unusual Xylotheque with Plant Illustrations from Early Meiji Japan<sup>1</sup>

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**An Unusual Xylotheque with Plant Illustrations from Early Meiji Japan.** Two unusual wood collections, reported previously in the collections of the Botanical Museum at Berlin-Dahlem and the Royal Botanic Gardens, Kew, take the form of framed plant illustrations painted on boards made from the wood of the species illustrated. We present new finds of very similar wood collections in the Economic Botany Collection of the Harvard University Herbaria, a private collection in the U.K. (Loudon collection), and at the Koishikawa Botanical Garden of the University of Tokyo. A stamp on the reverse of the boards links all five collections to Chikusai Kato, an artist working at Tokyo University (now the University of Tokyo) in early Meiji Japan, under the direction of the preeminent nineteenth century Japanese botanist Keisuke Ito. New evidence from contemporary historical accounts indicates that more than 100 boards were ordered in June 1878 by Hiroyuki Katō, the first president of Tokyo University, most likely to support the early teaching of Western-influenced botanical science in Japan. However, while the boards had clear value for teaching, especially about useful plants, their unusual fusion of Western and Japanese influences also made them desirable craft objects that were collected and given as gifts during the early Meiji era.

明治初期に日本で作られた特異な植物図版について。これまでベルリン・ダーレムの植物博物館とイギリス王立キュー植物園に知られていた植物図版は、枠付きの木製の板の上に描かれており、その板はその植物の材を用いられていることで大変特徴的である。最近、同様な植物図版がハーバート大学植物標本館、ロンドン個人コレクション(Loudon氏蔵)と東京大学附属小石川植物園にも見出された。裏面の篆刻印から、これらの植物図版は東京大学創立初期の1878年に当時の著名な植物学者伊藤圭介教授の指導の下に、そこで働いていた植物画家加藤竹斎によって描かれ、制作されたことが分かる。当時の資料などから新たに分かったことは、当初作成された100枚余の植物図版は

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<sup>1</sup>Received 21 August 2012; accepted 15 March 2013; published online 19 April 2013.

**Electronic supplementary material** The online version of this article (doi:10.1007/s12231-013-9227-6) contains supplementary material, which is available to authorized users.

初代東京大学総長(当時は総理といった)によって、近代的植物科学の教育手段として購入されたと推定される。しかしながら、これら図版は有用植物の教育手段として優れているが、同時に西洋と日本の画法の融合したユニークな図版であることから工芸品としてもみなされ、明治初期には収集されたり、また、贈答品としても用いられていたことが分かった。

**Key Words:** Botanical illustration, education, Chikusai Kato, Keisuke Ito, Meiji Japan, wood collections, University of Tokyo.

## Introduction

In Central Europe during the eighteenth century, an early manifestation of increasing scientific interest in trees and their woods was the development of *Holzbibliotheken*, labeled samples of different woods each carved into the shape of a small book (e.g., Bellermann 1788). In some cases, these collections took the form of elaborate boxes, made to mimic books, which displayed and preserved different plant parts, such as needles, cones, fruits, or even models of them (e.g., Baldini 1993a). These collections, sometimes with explanatory printed matter, were produced in a small number of sets and are preserved in museums, libraries, monasteries, or stately homes that generally receive little attention from botanical scholars (e.g., Baldini 1993b; Feuchter-Schawelka et al. 2001; Kraml 1992; Praprotnik 1990; Speta 1992; Wiśniewski 2000, 2001). Among these collections, the *Holzbibliotheken*, preserved in Warsaw and Kazimierz Dolny, have been analyzed in great detail (Wiśniewski 2000; 2001), and other well-studied collections of this kind include those kept in the monastery of Kremsmünster (Kraml 1992), in the Prirodoslovnij Muzej in Ljubljana (Praprotnik 1990), and in the Museo Civico di Storia Naturale in Milan (Baldini 1993b).

In the nineteenth and early twentieth centuries, the approach embodied in *Holzbibliotheken* was displaced by the development of more obviously utilitarian wood collections that could be used for comparative studies of the properties, structure, and uses of wood (Baas 1981, 1982), as well as for public display. The “Timber Museum,” formerly housed in the Orangery at The Royal Botanic Gardens, Kew (Desmond 2007), or the displays of woods exhibited at late nineteenth century World’s Fairs, are of this kind. Many such xylotheques are preserved in botanical gardens, herbaria, museums, and universities around the world (Baas 1981; Stern 1988).

Among nineteenth century wood collections, two that originated in early Meiji Japan are now housed in the Botanical Museum Berlin-Dahlem and the Royal Botanic Gardens, Kew. They are

unusual in combining wood samples, mainly from economically important plants, with stylistically distinctive botanical illustrations (Lack 1999; Lack and Ohba 1998; Nesbitt 2010). In this paper we provide the first comprehensive account linking the Berlin-Dahlem and Kew collections with very similar collections recently recognized in the Harvard University Herbaria, a private collection in the U.K., and the Koishikawa Botanical Garden of the University of Tokyo. All five collections were made in or around 1878 and can be linked to the Koishikawa Botanical Garden of the newly founded Tokyo University (Nagata 2011; Nesbitt 2010).

The wood specimens in all the collections are uniform in size and construction. They are presented as a series of framed plant illustrations that are painted directly in tempera onto a board cut longitudinally from the wood of the species illustrated. All are labeled with the appropriate Latin binomial as well as the Japanese common name. On the back of most boards in all five collections there is a distinctive red stamp that incorporates the name of Chikusai Kato, the first botanical artist to be employed at the botanical garden of the newly created Tokyo University (now the University of Tokyo) (Lack 1999; Lack and Ohba 1998). The stamp indicates that the boards were either made by Chikusai Kato or under his supervision (Lack 1999). New evidence from contemporary historical accounts indicate that Chikusai Kato worked under the direction of the preeminent nineteenth century Japanese botanist Keisuke Ito and that some of the boards were undoubtedly used in the teaching of botany, especially the botany of useful plants. However, the unusual fusion of Western and Japanese influences seen in these unique botanical artifacts also made them desirable craft objects that were collected and given as gifts.

## Overview of the Five Collections

Baas (1981) first drew attention to the remarkable illustrated wood specimens at the Botanical Museum Berlin-Dahlem in his brief review of three historically important wood collections. Lack and

Ohba (1998) and Lack (1999) analyzed the Berlin collection in more detail, as well as the similar collection at the Royal Botanic Gardens, Kew. Among the 152 boards that comprise the Berlin collection and the 26 boards in the Kew collection, they concluded that 136 different species were represented.

Nine similar boards were purchased in Vienna in 2007 by one of the current authors (GL), and this led ultimately to the conservation of the Kew collection (Nesbitt 2010). As a result of correspondence between two of the other authors on this paper (TN and PRC), a similar collection comprising 25 boards was discovered wrapped in newspaper from 1964 and stored in a tea crate at the Koishikawa Botanical Garden of the University of Tokyo (Nagata 2011). A further small collection of eight boards was subsequently recognized in the Economic Botany Collection of the Harvard University Herbaria based on the recollection of Professor Hiroyoshi Ohashi (Professor Emeritus, Tohoku University, Sendai), who had seen them displayed there at a special event in 2007.

Taken together, the five collections that are currently known comprise 220 boards representing about 150 different species of Japanese plants. Approximately 70 species are represented by illustrations on more than one board, which are either composed similarly (Fig. 1c,d), appear to be similar but depict different botanical details (Fig. 1a,c), or show no similarity (Fig. 2). Most of the species illustrated, which are referred to here by their currently accepted name, have some economic or cultural significance. For example, they include timbers of importance for construction and shipbuilding (e.g., *Cryptomeria japonica* [L.f.] D.Don [Japanese cedar], *Zelkova serrata* [Thunb.] Makino [Japanese zelkova]), woods used in traditional crafts, such as making boxes and Go boards (e.g., *Torreya nucifera* [L.] Sieb. et Zucc. [Japanese nutmeg-yew]), and species with edible fruits or nuts (e.g., *Castanea crenata* Sieb. et Zucc. [chestnut], *Diospyros kaki* Thunb. [persimmon], *Ginkgo biloba* L. [ginkgo nut], *Punica granatum* L. [pomegranate], *Pyrus communis* L. [pear]). Other species are used as spices and incense (e.g., *Cinnamomum camphora* [L.] J. Presl [camphor]), in the production of lacquer ware (*Rhus verniciflua* Stokes [Chinese lacquer tree]), or in papermaking (*Broussonetia papyrifera* [L.] L'Héritier ex Ventenat [paper mulberry]). Many species have secondary uses in traditional medicine. Most of the species are native to Japan, but some were early introductions from

China, the Near East, and Southeast Asia (e.g., *Ginkgo biloba*, *Punica granatum*, *Cinnamomum loureiroi* Nees). A complete list of the species represented in the five collections and the names as they appear on the boards is given in the Appendix – See Appendix in the electronic supplementary material (ESM)

In all five collections, the board bearing the plant illustration is surrounded by a frame 34 cm long, 23 cm wide, and about 3 cm deep (Lack 1999) made from small branches of the species illustrated. Four corner pieces are made from short cylindrical cross-sections of branches, while the four struts between them are made from small branches covered by bark. Each board presents longitudinal and cross-sections of the wood, as well as samples of the bark. The portrait generally includes diagnostic botanical details such as shoots, leaves, inflorescences, and often details of flowers, fruits, and seeds. Each board thus provides a concise visual summary of the characteristics of the species, along with a label that includes the Latin name of the plant and the Japanese common name in both *kanji* and *katakana* characters.

Almost all of the boards have a red stamp from a *tenkoku* stone seal on the back that incorporates the name of Chikusai Kato. The stamp also proclaims the boards as a “new invention” completed in 1878, “Spring of the 11th year of Meiji” (Lack and Ohba 1998). Minor differences among the boards relate to details of the labels and the presence or absence of the Chikusai Kato seal or various other markings on the reverse.

## BERLIN

The Berlin collection comprises 152 boards of about 136 different species. Ninety-two of these species are unique to the Berlin collection. This collection is the only one to contain duplicates, with ten species represented by two boards. Three main styles of label are present among the Berlin boards. One of the boards, a *Camellia* species, is missing the label altogether. The most common style of label, seen on 92 boards, has an elaborate border, printed in red, that includes small, stylized flowers (Fig. 3b). The Latin binomials and Japanese names on these labels are usually printed but are occasionally handwritten. This style of label also appears on all nine boards in the Loudon collection, as well as on the Koishikawa boards, where they are covered by the labels of the Imperial University (see below). In the Berlin collection, 67 out of the 92 boards with this style of label have the Chikusai Kato seal stamped directly onto the reverse of the board, 12



**Fig. 1.** Four different boards with illustrations of *Cryptomeria japonica*, from the collections of the Koishikawa Botanical Garden (a); Botanical Museum Berlin-Dahlem (b); the Royal Botanic Gardens, Kew (c); and Harvard University Herbaria (d). All boards illustrate similar botanical components, though these differ in number, size, and placement on the boards. Note also that while the branching of the shoot on the Kew, Koishikawa, and Harvard boards is similar, the shoot on the Berlin board is different. The Koishikawa board illustrates the most botanical components, suggesting that the Kew and Harvard boards may have been copied from it or from a similarly complete source. The Berlin board is similar to the Koishikawa board in the botanical components illustrated and has five components, but is unique in its portrayal of the shoot.



**Fig. 2.** Illustrations of *Enkianthus perulatus* (Miq.) C.K. Schneid. from the Berlin collection, and *Rhus verniciflua* Stokes on boards, from the Berlin (*bottom left*) and Kew (*bottom right*) collections. These pairs of boards demonstrate cases in which portraits of the same species differ in content, composition, and style.

have the Chikusai Kato seal pasted on to a sticker on the back, and 13 are missing the seal.

A second common style of label in the Berlin collection, seen on 51 of the boards, is a plain paper label with the Latin binomial handwritten in black ink (Fig. 3d). Japanese names are written in Western script, or in Japanese characters that run left to right. On all other boards in the Berlin and other collections, the Japanese characters run right to left in the more traditional style. Boards with this second type of label are often made from thicker

and heavier wood, and are held together with wooden pegs rather than nails. None of these boards have the Chikusai Kato seal on the reverse, and the illustrations are stylistically different. The ways in which shoots and leaves are depicted is less formal, less rigid, and less precise.

A third style of label, seen in the Berlin collection on seven boards, is the same as that on all of the Kew boards. All of the information on the label is handwritten, and the border is formed by plain red lines (see below; Fig. 3a). Three of the boards have a



**Fig. 3.** The four primary label types found in the five collections. **a** The Kew-style label for the *Cryptomeria japonica* board in the Economic Botany Collection of the Royal Botanic Gardens, Kew. The handwriting is attributed to Jinzo Matsumura (1856–1928), who worked at Tokyo University at the time the boards were created. **b** The Berlin-style label is the most common label type; this label and slight variations of it are found in 92 of the boards in the Berlin collection, all 9 of the Loudon boards, and on the 24 Koishikawa boards with labels, beneath the Imperial University label. **c** The label on most of the Koishikawa boards, usually covering a Berlin-style label. This label bears the name of the Imperial University, the name used by the University of Tokyo from 1886 to 1897. In several cases the names on Koishikawa-style labels reflect more modern nomenclature than similar boards in other collections (See Appendix in ESM). **d** The paper label appearing on 51 boards in the Berlin collection; a similar plain paper label with different handwriting and no Japanese name appears on four boards in the Harvard Collection.

paper sticker on the back bearing the Kato seal, and two have the seal stamped directly on the wood. On the two other boards there is no Kato seal.

#### KEW

The Kew collection comprises 26 boards, all of different species. Twenty-five of these 26 species are also represented in other collections. All the Kew

boards have the same style of label (Fig. 3a), made from white-cream paper with a double border composed of a thick outer line and thin inner line in red ink. The label is divided in half horizontally by a thin red line. Unlike the two other styles of label seen on the Berlin boards, all of the information on Kew labels, whether in Western script, Japanese characters, or Chinese characters, is handwritten, rather than printed or typed. In all cases the Latin binomials are also accompanied by the authorities for the name. All the labels are written in the same hand. It has been suggested by H. Ohba (Lack 1999) that the Western script used for the Latin binomials on the Kew style labels is that of Keisuke Ito. However, a characteristic feature of this script is the unusual form of the lower case *y*, which is written with the “tail” vertical, rather than slanted to the left (Fig. 3a). This is exactly the same as in the correspondence of Jinzo Matsumura, an early director at the Koishikawa Botanical Garden. It is very likely that the labels on the Kew boards were written by him. All of the Kew boards bear the Chikusai Kato stamp on the reverse.

#### KOISHIKAWA

The Koishikawa collection comprises 25 boards, all of different species. Seventeen of the species are also represented in other collections. Twenty-three of the Koishikawa boards have a style of label not seen in the other collections, which designates them as property of the Imperial University, the name of the University of Tokyo during the period from 1886 to 1897 (Fig. 3c). However, these labels are pasted on top of labels with a red printed border of the kind that are common in the Berlin collection (Fig. 3b). One of the boards has only a piece of the red-bordered label remaining and no Imperial label, which may have become detached. Another board is missing any label, with only a lighter mark indicating where it was once attached. All the Koishikawa boards bear the Kato seal on the reverse, two of which are stamped onto a paper attached to the back. The Koishikawa boards are unique in that they also bear paper stickers in the lower left hand corner numbered 1–25 in no particular taxonomic order.

#### LOUDON

The Loudon collection comprises nine boards, all of different species. Seven of the species are also represented in other collections. All bear the same style of red printed label seen in the Berlin and

Koishikawa collections (Fig. 3b). All the boards in the Loudon collection have Kato seals on the reverse.

#### HARVARD

The Harvard collection comprises eight boards, all of different species. Six of the species are duplicated in other collections. Three of the boards have the Kew-style label, two of which have the Kato stamp on the reverse. Five have plain paper labels that are handwritten in black ink in Western script. None of these boards have a Kato seal on the reverse. These handwritten labels are very similar to the second most common style of label in the Berlin collection (Fig. 3d). However, they are written in a different hand, and the Harvard labels do not include Japanese names.

### Evidence on the Origin of the Illustrated Wood Samples

The stamp on the reverse of most of the boards indicates that they were manufactured in 1878, very early in the development of Western-influenced botanical science in Japan, and that they were the work of Chikusai Kato, a botanical artist at the Koishikawa Botanical Garden of Tokyo University. At that time, the senior botanist at the garden was Professor Keisuke Ito. Ito had studied botany with Philipp Franz von Siebold in 1827 at the Dutch trading base on Deshima in Nagasaki Harbor, and subsequently was influential in promoting the principles of Western science and education in Japan. Among his contributions, Ito translated many important foreign works into Japanese, including Thunberg's "*Flora Japonica*." He was the first to correlate the Latin binomials for different species with their equivalent Chinese and Japanese common names (Ito 1900).

Details about the manufacture of the illustrated wood samples are given in "Kinkaou-Nisshi," the diary of Keisuke Ito (Ito 2010). The entry for June 9, 1878, notes that Chikusai Kato brought ten illustrated wooden boards to be examined by Ito, and the diary entry for June 15, 1878, indicates that Mr. Sakari Shishido, a botanist, visited to look at the collection. On June 17, 1878, the diary records that President Hiroyuki Katō, the first President of Tokyo University, sent someone to collect the boards, which were purchased for 12 yen. An order was placed for 50 more boards. The entry in Ito's diary for June 20, 1878, records that Chikusai Kato

received 50 yen for the 50 boards ordered previously, and that an order was placed for a further 50 boards. The diary entry for June 22, 1878, records that 50 boards prepared by Chikusai Kato were named and reported to President Katō. An order for a further 50 boards was also placed.

Taken together, the records in Ito's diary indicate that between June 9 and June 22, 1878, at least 160 boards were ordered and some were clearly delivered and paid for. It is uncertain whether all of the boards were manufactured in this very short period of time. Certainly it would not have been possible for Chikusai Kato to complete the work alone. That there was a team of artisans overseen by Chikusai Kato seems more likely. This, combined with a degree of haste, might also account in part for differences in style, quality, and level of detail among similar portraits, as well as confusion in some of the labeling. In a few cases, wood of other species was substituted for constructing some of the boards (Lack and Ohba 1998).

### Western and Japanese Influences on the Origin of the Illustrated Wood Samples

The ways in which the illustrated wood samples are presented reflect Western influences on science and art in Japan that had been building through the nineteenth century. Especially important was Philipp Franz von Siebold, through his direct influence on Keisuke Ito, his contact with Tokunai Mogami (Baas 1981; van Gulik 1986; Lack 1999), and his promotion of Western style botanical art.

Working around 1799, Tokunai Mogami had recorded the woods that were being used in Northern Hokkaido for various purposes. For each species, he prepared a small wood sample on which he painted black and white illustrations of leaves and other parts of the corresponding tree. These wood samples were presented to Siebold when he met Tokunai Mogami during Siebold's journey to Yedo in 1826 (Yamaguchi and Kato 1998). In several respects, these wood samples presage the larger and more elaborate boards with plant portraits made by Chikusai Kato nearly 80 years later.

Siebold's influence can also be seen in Chikusai Kato's illustrations. In the 1820s, Siebold had invited the European artist C. H. de Villeneuve



**Fig. 4.** A botanical illustration and two illustrated boards of *Ginkgo biloba* showing the strong similarities in style and composition of all three portraits. The botanical illustration of *Ginkgo* is attributed to the botanical artist Chikusai Kato and is in the collections of the Koishikawa Botanical Garden. The vertical Japanese script reads (top to bottom): Ichō (Japanese word for *Ginkgo biloba*, in katakana script); Grandfather Grandchild tree (Japanese term for *Ginkgo biloba* in kanji script); Coniferae (in kanji script). The Kew board (bottom left) shows more components and greater detail than the Berlin board (bottom right), although both were constructed in 1878 and appear to be based on the botanical illustration or a similarly complete source.

to Deshima for the express purpose of making illustrations. Both de Villeneuve and Siebold worked closely with the prominent Japanese artist Keiga Kawahara, whom Siebold had commissioned to draw Japanese plants (Kimura and Grubov 1993). Some of the illustrations prepared by Keiga Kawahara for *Flora Japonica* are considered to be the result of joint work with de Villeneuve (Kimura and Grubov 1993). Siebold's influence on Chikusai Kato is seen in the illustration of *Paulownia tomentosa* (Thunb.) Steud. in the Harvard collection, which can be

linked both to similar illustrations of the same species in "*Flora Japonica*" (Siebold and Zuccarini 1835–1870) and a still earlier work by Keiga Kawahara (Kawahara 1837).

Trained according to the traditional school of *Kanō* that depicts scenes of nature in traditional ways with bold brushwork and bright colors, Chikusai Kato went on to become a member of the Painting Appreciation Society in the 1880s. The Painting Appreciation Society was a movement dedicated to encouraging and valuing traditional Japanese art styles, particularly the work of *Kanō*

sect painters, and establishing a niche for this work in the burgeoning private art market. Like Chikusai Kato, many members of the Painting Appreciation Society had been trained in traditional painting styles, but also had firsthand experience of Western painting (Sato 2011; Weston 2003).

A mixture of Japanese and European influences is clearly seen in Chikusai Kato's plant portraits (Lack 1999; Lack and Ohba 1998). For example, in the duplicate portraits of *Ginkgo biloba* L. in the Berlin and Kew collections, the black brushwork in which the branch and short shoots are outlined, and the way in which they are depicted, are Japanese in style, but the way in which botanical details of the ovulate shoots, pollen cones, and seeds are illustrated separately is characteristic of Western botanical art. The *Ginkgo* illustrations on both the Berlin and Kew boards were most probably copied independently from more extensive, and still more detailed, unpublished botanical sketches by Chikusai Kato that are preserved in the collections of the Koishikawa Botanical Garden (Fig. 4).

### The Use of the Boards and Their Dispersal

The purchase by President Hiroyuki Katō of Tokyo University, recorded in the diary of Keisuke Ito, suggests that the boards were to be used in the teaching of Western-influenced botany in the early days of the university. More direct evidence comes from a contemporary account by the Harvard-trained zoologist Edward Sylvester Morse, who arrived in Japan in June 1877 and remained until 1879 as the first professor of Zoology at Tokyo University. Later in life Morse published "Japan Day by Day," a popular account of his time there. In his entry for June 16, 1878, one day after the first mention of the boards in the Keisuke Ito diary, Morse illustrates a framed plant portrait on a wooden board that is very similar to the illustrated wood samples considered here (Fig. 5; Morse 1917, p. 396). He describes them as "an ingenious way to teach botany." Nails on the backs of all boards in the Koishikawa collection, including several still with string attached, also indicate that the boards were once displayed.

However, while Morse had confirmed their use in teaching, Keisuke Ito also provides evidence that even at the time of their manufacture, the boards were also regarded as interesting craft objects that were given as gifts to influential figures. Ito records that in 1878, ten boards were

**June 16.** I was awakened by another earthquake which shook the house, made the doors rattle, and kept up for half a minute.



FIG. 326

Figure 326 represents an ingenious way to teach botany. The panel is of the wood of a tree upon which its flowers are painted; the frame shows the bark of the tree; and the corners of the frame are sections of the branches

Mrs. Takamine came to-day with the little Japanese boys who play with John. She brought with her three little devices in silk crape which look like pin cushions, but have pockets behind

**Fig. 5.** A sketch and description of the use of the illustrated woodblocks from the Edward Sylvester Morse's journal entry for June 16, 1878 (Morse 1917).

presented to Tsugumichi Saigō, a general in the Japanese Army, who at that time was also serving as Education Minister (Ito 2010). Thus, as noted in the seal on the reverse of the boards, from the very beginning the boards were regarded as a desirable "new invention," not just aids for teaching. This is further confirmed by the board of *Broussonetia papyrifera* in the Loudon collection that has a Japanese auction sticker on the back. In *kanji* characters that run right to left, in the early style, the auction price is given as 14 yen 40 sen: considerably more than the price for which the boards were purchased by President Katō.

The desirability and collectability of the boards, combined with their botanical interest, may have contributed to their dispersal into several Western collections. The Berlin collection, in particular, with its large number of duplicated species, seems to have been deliberately compiled from multiple original sets that had different labels. Records in Berlin indicate that the collection was donated to the Botanical Museum Berlin-Dahlem in 1911 by Paul Kuegler, a senior staff physician in the German navy, but beyond that little is known (Lack 1999; Lack and Ohba 1998). The two cabinets housing the Berlin collection were evidently purposely built in central Europe in the late nineteenth century for preserving the boards rather than displaying them. It is also notable that the Loudon collection had earlier been in Berlin prior to its auction in Vienna (GL, pers. comm.).

Unfortunately, the circumstances and date of acquisition of the Kew collection are unknown (Nesbitt 2010; pers. obs. 2012), but there may be a connection to the circle of British diplomats in

early Meiji Japan, many of whom were interested in botany and the uses of plants. In contrast, the source of the Harvard collection is clear. One of the boards has the name card of Edward Sylvester Morse nailed onto the back. During his time there, Morse made extensive collections of artifacts and art from Japan, which now form a large part of the Japanese collections at the Boston Museum of Fine Arts and the Peabody Museum, Essex. The boards now at Harvard were evidently among the collections that he made.

### Conclusions

The unusual xylotheque described here, which combines samples of woods with botanical illustrations, reflects innovations in art and in the teaching of science at a moment of major cultural transition in early Modern Japan. The partly European style of Kato's plant illustrations, along with the presentation of both Latin binomials and Japanese common names on the accompanying labels, reflect increasing Western influence on science and the teaching of science in Japan around the Edo to Meiji transition, which can be traced back to Siebold. However, both the boards and the illustrations were also commissioned and overseen by innovators in the Edo to Meiji transition, such as Keisuke Ito and Chikusai Kato, who were responding to broader cultural changes underway in Japanese society at the time. This transitional period was marked by the promotion of artistic craft by the Dragon Pond Society as items for export in accordance with the new *shokusan kogyo* policy, which promoted manufacturing and the export of industrial goods (Sato 2011). Reflecting both innovation and the opportunities inherent in the use of Japan's plant resources, the boards blur the boundaries among creative art, invention, and scientific education. Their intrinsic botanical interest, combined with their desirability as exemplars of early Meiji Japanese craft, almost certainly contributed to their export from Japan and their presence today in four separate collections in the West. It would not be surprising if other collections of these boards remain unrecognized, both in Japan and in the West.

### Acknowledgments

We thank Judith Warnement and Lisa DeCesare for their assistance with the Harvard collections, and Kathrin Grotz and Sarah Bollendorff for kindly facilitating access to and

photography of the collections in the Botanical Museum Berlin-Dahlem. We also thank Mio Kitayama for help with Japanese translations, and we are deeply indebted to Professor Jin Murata, Director of the Koishikawa Botanical Garden, for access to the Koishikawa collection and for permission to publish an image of the Chikusai Kato illustration of *Ginkgo biloba*. We thank Dr. Tetsuo Ohi-Toma for providing the images of the Koishikawa boards. This paper benefited enormously from constructive comments by two anonymous reviewers.

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