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RESEARCH ARTICLE

The 'book' as fieldwork: 'textual institutions' and nature knowledge in early modern Japan

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Abstract

The analysis of a painting attributed to the *rangaku* scholar Shiba Kōkan is the occasion to recover the genesis of a stereotypical narrative of Japanese scientific modernization and to survey the role of books in the intellectual life of Tokugawa naturalists. For the practitioners of materia medica (*honzōgaku*), the knowledge of nature began and ended with, and in between continuously referred to, books – Chinese, Japanese and later 'Dutch'. Canonical texts gave scholars terminology, taxonomy, philosophical justification and legitimation, but not all books had equal value in affecting scholars' practices. A precise hierarchy, in fact, organized texts, from canonical encyclopedias to private fieldnotes, into 'textual institutions' that encouraged further research at the same time that they regulated and framed scholars' cognitive claims.

> Whether they are in manuscript or in print, books are objects whose forms, if they cannot impose the sense of the texts that they bear, at least command the uses that can invest them and the appropriations to which they are susceptible. Works and discourses exist only when they become physical realities …
>
> Roger Chartier[1]

A painting attributed to Shiba Kōkan (1747–1818), eclectic scholar and artist of late Tokugawa Japan, shows three men around a table (Figure 1).[2] On the left, a Chinese literatus sits wrapped in a dark green robe, arms crossed, in front of him a closed manuscript scroll and a *ruyi* sceptre, a sort of talisman common in Daoist and Buddhist representations but in the Qing period used as symbol of power and moral authority for deserving nobles, ministers or generals. On the right, a Dutch physician, with a long curly wig,

1 Roger Chartier, *The Order of Books: Readers, Authors, and Libraries in Europe between the 14th and 18th Centuries*, Stanford, CA: Stanford University Press, 1994, pp. viii–ix.

2 The attribution is far from certain. The Clark Center for Japanese Art & Culture donated the painting to the Minneapolis Institute of Art, but it does not appear in any catalogues of Shiba Kōkan's work I consulted. The name in the colophon appears authentic, but the calligraphy and the seal look odd. In that regard, see the collection of Kōkan's seals and signatures in Naruse Fujio, *Shiba Kōkan: Shōgai to gagyō*, 2 vols., Tokyo: Yasaka Shobō, 1995. I would like to acknowledge the professional guidance and expertise of Mai Yamaguchi on this issue. To simplify exposition, however, I suspend judgement and treat the painting as if by Kōkan.

Figure 1. Shiba Kōkan (attr.), *A Meeting of Japan, China, and the West* (late eighteenth century). Minneapolis Institute of Art. Dimensions: 101.6 × 49.53 cm without roller.

wrapped in what the artist imagined to be a European scholarly gown, sits with an open book in his hands, the visible page showing the picture of a human skeleton that scholars of the time would have probably read as a reference to the original source of Sugita

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Genpaku's *Kaitai shinsho* (1774), which passed as a Japanese rendition of a Dutch translation of the German *Anatomische Tabellen* by J.A. Kulmus (1689–1745).[3] A Japanese gentleman, elegantly dressed with a family crest in the *kataginu* jacket, sits in the middle. He is noticeably larger than the other two men: he looks like a samurai, but he has no swords in his sash, an indication that he could be a physician, a scholar (*jusha*), or both. He holds a fan, with which he seems to be playing lazily. A white snake – or a snake-like bracelet – wraps his right wrist. Since he does not have any book in front of him, he gives the impression of being a student of the other two scholars – or that at least he is ready to learn from them both, stirred in turn to his left and his right by the arguments advanced by the two learned men. But he seems to pay little attention to the two sages from distant lands, lost in observation of two medicinal plants in a square vase in front of him: a monkshood (*Aconitum japonicum*) and a buttercup (*Ranunculus auricomus*).

The image is a playful variation on the canonical theme of the unity of three doctrines (*sankyō*, *sanjiao* in Chinese), usually representing images of Buddha, Laozi and Confucius standing for the three teachings of Buddhism, Daoism and Confucianism. Although these paintings rarely represented the three creeds in a relation of equality with each other, the author of this *Meeting* imbued the image with militant proselytism for the cause of *rangaku* – Dutch studies.[4] In the late eighteenth century, *rangaku* was not really a well-defined field. The term loosely referred to the work of an ensemble of translators, physicians and amateur scholars who expressed an interest in European books, objects and paintings, or at least sprinkled their own treatises with information taken from European books. Despite the financial support of wealthy patrons like Kimura Kenkadō, it remained for most of the period a sociologically dominated field vis-à-vis other established disciplines directly or indirectly supported by the samurai elites, and its practitioners were often regarded only slightly higher in rank than 'translators' (*yakusha*) and thus unqualified to contribute to scholarly production.[5] Before the nineteenth century, *rangaku* did not have learning institutions or advanced language training, nor did its practitioners enjoy social recognition for their scholarly labour outside the small circle of artists and thinkers interested in Dutch learning. It contributed to pre-existing disciplines with information, techniques and objects, but until well into the first decades of the 1800s it did not affect knowledge formation (in terms of institutions, terminology, topics, authority and so on) among scholars.[6]

It is therefore as a polemical intervention that this representation of a meeting of 'China', 'Japan' and 'Europe' should be read. The author suggested a path for Japanese

3 Timon Screech conjectured that the European scholar is Lorenz Heister (1683–1758), a German anatomist, surgeon and botanist whose *Heelkundige Onderwijzingen* (first edn 1741) circulated in Japan and was partially translated by Sugita Genpaku in *Yōi shinsho* (New Book on the Treatment of Wounds). Heister's portrait in the frontispiece of the Dutch edition of *Chirurgie* (1739) has striking resemblances with the Westerner in the painting. See Kobayashi Tadashi and Yamamoto Yukari (eds.), *Delightful Pursuits: Highlights from the Lee Institute for Japanese Art at the Clark Center*, Tokyo: Nihon Keizai Shinbun, 2002, p. 95.

4 For an introduction in English on *rangaku* see Timon Screech, *The Lens within the Heart: The Western Scientific Gaze and Popular Imagery in Later Edo Japan*, London: Routledge, 2002; and Donald Keene, *The Japanese Discovery of Europe, 1720–1830*, Stanford, CA: Stanford University Press, 1969. A more recent monograph is Terrence Jackson, *Network of Knowledge: Western Science and the Tokugawa Information*, Honolulu: University of Hawaii Press, 2016.

5 See Nishimura Saburō, *Bunmei no naka no hakubutsugaku: Seiō to Nihon*, vol. 2, Tokyo: Kinokuniya Shoten, 1999, pp. 457–63. While acknowledging the inferior status of *rangaku* vis-à-vis other disciplines, historian Sugimoto Tsutomu treats them as heroic adventurers of knowledge who single-handedly projected Japan towards scientific modernization because of their openness to European knowledge. See his *Edo jidai hon'yakugo no sekai: Kindaika o suishin shita yakugo o kenshō suru*, Tokyo: Yasaka Shobō, 2015; and *Edo no hon'yakushatachi*, Tokyo: Waseda Daigaku Shuppanbu, 1995. For the persistence of this view outside Japanese academia see Jackson, op. cit. (4).

6 See Federico Marcon, *The Knowledge of Nature and the Nature of Knowledge in Early Modern Japan*, Chicago: The University of Chicago Press, 2015, pp. 161–275.

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scholars that was antagonistic to what he implied to be the predominant organization of knowledge in the period. The three scholars are most likely physicians, and the Japanese is portrayed as ostensively trapped between two irreconcilable paradigms of knowledge, which are here represented in the most stereotyped fashion: the aprioristic, homeopathic, holistic method of traditional Chinese medicine, the practitioner of which has no need to consult a text because he has internalized the inherent patterns regulating matter and mind; and the allopathic, inductive, procedural method of Dutch medicine (*ran'i*), which surgically intervened in patients under the guidance of anatomical schemas presented in atlases similar to the book shown in the painting. Does the Japanese scholar need to choose between them? Must he try to find a synthesis of the two irreconcilable ways? The painting does not explicitly say, but it suggests a certain sympathy for nature, an instinctual empiricism, in the attitude of the Japanese man: he does not look at books but at the two flowery plants and lets a snake wrap around his arm.

The painting does not explicitly indicate a choice, but it is not neutral vis-à-vis the two paradigms. In the background of the main scene, the author offers a framing device that throws light on how the meeting should be understood. In a faraway place, separated from the three scholars by vapours, a fire engulfs a pagoda as three groups struggle to quell the flames. A troop of Chinese firefighters, hierarchically organized, throws pitifully small buckets of water against the raging flames, dutifully following the orders of a team leader dressed like a Confucian official, but to no actual effect. On the right, seven sumo wrestlers are carrying three gigantic tubs of water, but the impressive exercise of muscular power is too slow, and it is easy to imagine that by the time they reach the pagoda, the fire will have turned it into ashes. Between the two failing groups, however, an enterprising squad of five Europeans is operating a machine that projects a powerful flow of water onto the flames. The allegorical meaning of the stereotypical vignette is clear: the hierarchical organization of Chinese society led by literati officials and the sheer energy of Japanese samurai society – somewhat representing the two guiding principles of Confucian metaphysics, 'pattern' (*ri*) and 'energy' (*ki*) – both fail to achieve what technological enhancement can: only 'Western learning' can save Japan from the crisis (the pagoda on fire) of the 1780s.[7]

The contrast between Chinese (Confucian) tradition, on the left, and Western 'science', on the right, that the Japanese scholar is placed to mediate transforms this promotional illustration for *rangaku* into an allegory that, like a message in a bottle, heralded a template that modelled one of the dominant interpretations of the development of modern science in Japan. An oversimplified version of this paradigm – prevailing among Japanese historians of indigenous science like Ueno Masuzō, Kimura Yōjirō and Sugimoto Tsutomu in the twentieth century, but still lingering today – conceives of 'science' as a Western invention of universal value that scattered around the world in the nineteenth century, following the imperial expansion of European and American capital.[8] In Japan, science found fertile ground for rapid germination because of the enterprising interest of a group of scholars we now call *rangakusha*. Thanks to their empirical and pragmatic approach, they understood the superior epistemological and utilitarian value of Western science and were fast to adopt, promote and disseminate it in Japan. This outdated interpretation does not stand the test of new archival research and conceptual developments in the historiography of science. In my work, I have demonstrated that in the course of the Tokugawa period a field of nature studies, grown out of a traditional

7 The economic crisis of 1782–4 triggered by the Great Tenmei Famine.

8 Illustrative examples of their vast production are Ueno Masuzō, *Nihon hakubutsugakushi*, Tokyo: Kōdansha Gakujutsu Bunko, 1989; Kimura Yōjirō, *Nihon shizengakushi no rekishi*, Tokyo: Chūōkōronsha, 1974; and Sugimoto Tsutomu, *Edo no hakubutsugakushatachi*, Tokyo: Seidosha, 1985.

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discipline of materia medica (*honzōgaku*), locally transformed and instigated cognitive practices that resembled similar developments in European *naturalis historia* without being directly influenced by its methodology. I showed how its practitioners relied on information from European texts without being affected by their epistemological approach, but rather extrapolated data and rearranged them in the format of traditional encyclopedic entries.[9] I challenged the conventional view, symbolically prefigured in Kōkan's painting, that conceived of late nineteenth-century Japan as a passive receiver of modern 'science' from Enlightened Europe whereby 'the paradigms in effect in the Tokugawa period were all replaced by Western ones, and government policies restricting certain fields did not survive the demise of the shogunate'.[10] Against this view, I indicated that in the field of nature studies the transformation of traditional disciplines into modern life sciences like botany, zoology and biology was a process of adaptation rather than adoption, translation and synthesis rather than substitution.[11]

This essay reiterates that argument from the perspective of Tokugawa naturalists' use of books to produce knowledges, practices and legitimation of cognitive claims. It proposes a less teleologically compromised reading of Kōkan's allegorical painting and prefigures a different trajectory of investigation that looks at the central role of books in scholarly practices in early modern Japan. Focusing on Japanese natural history, it reconstructs the role of texts in storing, transmitting and legitimating cognitive claims on plants and animals. By reconstructing the different uses of books within a distinct hierarchy of textual authority deriving from Confucian learning, and focusing on those texts that more closely resembled 'manuals' and 'handbooks', it suggests that Kōkan's portrait of the Chinese sage in front of a closed scroll was an invention that had no bearing on naturalists' practices but rather aimed at promoting a discipline with which the author identified.

Learning from which 'books'?

The learned practices of Tokugawa scholars, like those of their European counterparts, were completely wrapped up in books. Erudition and promptness of citing from a vast repertoire of textual sources, either canonical or specialized, gave authority to scholars and legitimacy to their claims.[12] In East Asia as in Europe, both commentaries on canonical texts and new treatises relied on citation of an extended corpus of texts.[13] A shared textual canon gave internal consistency to the language and terminology of different branches of learning. The bookish nature of scholarly activities extended also to those practices that today we tend less to associate with books, like experimental and observational sciences, medicines, pharmacology and the like.

9 Marcon, op. cit. (6), pp. 127–39.

10 James R. Bartholomew, *The Formation of Science in Japan: Building a Research Tradition*, New Haven, CT: Yale University Press, 1989, p. 9.

11 Marcon, op. cit. (6), pp. 299–305. See also Federico Marcon, '*Honzōgaku* after *seibutsugaku*: traditional pharmacology as antiquarianism in early Meiji Japan', in Benjamin Elman (ed.), *Early Modern Asian Medical Classics and Medical Philology*, Leiden: Brill, 2015, pp. 148–62.

12 See Haruo Shirane, 'Mediating the literary classics: commentary and translation in premodern Japan', in Benjamin Elman (ed.), *Rethinking East Asian Languages, Vernaculars and Literacies, 1000–1919*, Leiden: Brill, 2015, pp. 129–46; and Daniel Trambaiolo, 'The languages of medical knowledge in Tokugawa Japan', in Elman, op. cit., pp. 147–68.

13 See Ann Blair, *Too Much to Know: Managing Scholarly Information before the Modern Age*, New Haven, CT and London: Yale University Press, 2010; Benjamin A. Elman, *From Philosophy to Philology: Intellectual and Social Aspects of Change in Late Imperial China*, Los Angeles: UCLA Asian Pacific Monograph Series, 2001; and Nagatomo Chiyoji, *Edo jidai no tosho ryūtsū*, Tokyo: Shibunkaku Shuppan, 2002. See also Marcon, op. cit. (6), pp. 72–86.

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In Tokugawa Japan, professional and amateur naturalists might have worked as pharmacologists, herbalists, agronomists, lexicographers, encyclopedists, pedagogues, philosophers or professional gardeners – practitioners, that is, of forms of nature knowledge all loosely referred to by the term *honzōgaku*.[14] But no matter whether their research was instrumental, cognitive, aesthetic or merely recreational, they spent more time with books than with actual plants, herbs, birds or insects. Well into the nineteenth century, some scholars could act as professional *honzōgaku* specialists relying on book knowledge, rather than work with actual specimens of plants and animals. Even among the most empirically oriented, like the group of *honzōgaku* practitioners centred in Owari in the early nineteenth century, observational practices were subjected to the authority of canonical sources, the claims of which could not be disproved by observation alone.[15] In short, throughout the period, investigations of plants and animals began with books, ended with books, and in between constantly made reference to books to frame and authorize empirical observations and practices.

I use the term 'book' here in its simplest semantic sense. In the historiography of Japan, the English 'book' is routinely used to refer to a variety of material objects in circulation in the early modern period. If uncritically adopted, the category 'book' risks projecting connotations that are alien to the historical context of early modern Japan. In fact, the English term 'book' does not merely stand in its primitive sense of the material bearer of a text but metonymically encompasses the social and intellectual uses that texts had within a historically specific community of scholars. The question pertains to scholarly practices as well as conceptions: if 'books' played a fundamental role in regulating scholarly practices, how did Tokugawa naturalists use 'books'? Did the form of these material bearers of texts affect their usage, fungibility and credibility? Were all 'books' equally authoritative? And how consistent and resistant to change were naturalists' 'books'?

The English 'book' refers both to the material bearer of a text and, metonymically, to the text it contains – at times, even to the content of texts, doubling the metonymical drift. 'Book' can stand for a 'portable volume consisting of a series of written, printed, or illustrated pages bound together for ease of reading' (1.a); a 'written composition long enough to fill one or more such volumes' (1.b); and figuratively documents used as legal records, accounting logs (2.b), liturgical texts (3.a and 3.b), or the sections into which a work is subdivided, as synonym of 'volume' and 'part' (4). 'Book' is also semantically co-textual of 'learning', 'scholarship' and 'study', in abstract, symbolic or instructional senses (5, 6.a).[16] The history of the term, its meanings and its referents, as well as of the connotations attached to it, is not erased when we use the term 'book' comparatively to refer to material portable bearers of texts in different historical contexts.[17] After the consolidation of literary studies and genres in modern Europe, the metonymical use of 'book' for its content acquired connotations of wholeness, stability of content and authorship, completeness, and unity (often of both text and author) that are naturalized in the common use of the term.[18] Those connotations risk being projected onto different

14 *Honzōgaku* is the Japanese reading of the Chinese *bencao* tradition, literally meaning either 'fundamental herbs' or 'roots and herbs', and referring to a tradition of pharmacological learning. See Marcon, op. cit. (6).

15 See Ueno Masuzō, *Kusa o te ni shita shōzōga*, Tokyo: Yasaka Shobō, 1986; Isono Naohide, 'Yakuhinkai, honzōkai', *Keio gijutsu daigaku hiyoshi kiyō* (2001) 26, pp. 6–14; and Endō Shōji, *Honzōgaku to yōgaku*, Kyoto: Shibunkaku Shuppan, 2003.

16 See entry for 'book, n.' in *OED Online*, Oxford University Press, September 2019, at www.oed.com/view/Entry/21412 (accessed April 2020).

17 Michael F. Suarez and H.R. Woudhuysen, eds., *The Book: A Global History*, Oxford: Oxford University Press, 2013.

18 On the metaphorical uses and connotations of 'book' in early modern and modern Europe see Hans Blumenberg, *Die Lesbarkeit der Welt*, Frankfurt am Main: Suhrkamp, 1981. The internal self-containment we associate with 'books' is

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historical contexts when the term is utilized as heuristic category. Semantic connotations of unity and self-containment persist in our metaphorical usage of the term 'book', despite the fact that, as Adrian Johns has argued against Elizabeth Eisenstein's conception of a stable and unitary printed book as catalyst of European modernization, early modern books, either printed or manuscript, were quite far from fixed and stable.[19]

Tokugawa 'books' had different but equally complex connotations, discouraging the adoption of 'book' if it were not so impractical.[20] The term *sho* – phonetic rendition of the Chinese logograph 書 – referred to the material bearers of texts and/or images in general, which could take the form of a scroll (*makimono*) or of a bound volume (*orihon* and *kōchōsō*).[21] The character 書 literally means 'text' and 'to write'. Contrary to the Latin *liber* and the old Germanic *buoch* (from which 'book'), it is its usage to refer to the material bearers of a text that is originally metonymical, so that the generic term 書 could stand for a manuscript or printed book in the form of scroll or bound volume. It could also refer to the discursive content of a document, as in compound expressions like *jōsho* and *shōsho* – respectively the words of rulers (emperor, ministers, shogun, etc.) and edicts and legal documents.[22] The connotative complexity of *sho* is narrower than 'book': even in the case of the Four Books of the Confucian tradition, the term *sho* rarely had connotations of completion, but rather of a hierarchically structured 'textual institution' that contained an 'original' text inseparable from the gargantuan ensemble of variations and commentaries accompanying it.[23]

I use the metaphor of 'institution' rather than the more conventional 'library' to emphasize the systematic association of texts into a structured whole that gave them meaning, pertinence, semiotic use and legitimacy. The expression 'the Four Books' (Ch. *sishu*, Jp. *shisho*), for instance, does not refer simply to four books, but to a constellation of texts (commentaries, monographs, glossaries, etc.) connected to them. To understand how and what Tokugawa scholars 'learned by the book', we must therefore consider the

also the result of historical developments in 'authorship' – as in Chartier, op. cit. (1), pp. 25–60 – and bibliography – see D.F. McKenzie, *Bibliography and the Sociology of Texts*, Cambridge: Cambridge University Press, 1999. Scholarship on the manuscript culture of early modern Europe has enriched our understanding of books and authorship. See Harold Love, *Scribal Publication in Seventeenth-Century England*, Oxford: Clarendon, 1993; Peter Beal, *In Praise of Scribes: Manuscripts and Their Makers in the Seventeenth Century*, Oxford: Clarendon, 1998; on note taking from and in books and on notebooks culture see Richard Yeo, *Notebooks, English Virtuosi, and Early Modern Science*, Chicago: The University of Chicago Press, 2014; and Angus Vine, *Miscellaneous Order: Manuscript Culture and the Early Modern Organization of Knowledge*, Oxford: Oxford University Press, 2019.

19 See Adrian Johns, *The Nature of the Book: Print and Knowledge in the Making*, Chicago: The University of Chicago Press, 2000; and Elizabeth L. Eisenstein, *The Printing Press as an Agent of Change*, Cambridge: Cambridge University Press, 1979.

20 For an overview see Nagatomo Chiyoji, *Edo jidai no shomotsu to dokusha*, Tokyo: Tōkyōdō Shuppan, 2001; Chiyoji, *Edo jidai no tosho ryūtsū*, Tokyo: Shibunkaku Shuppan, 2002; Nakano Mitsutoshi (ed.), *Nihon no shuppan*, Tokyo: Perikansha, 2005; and Peter Kornicki, *The Book in Japan: A Cultural History from the Beginning to the Nineteenth Century*, Honolulu: University of Hawaii Press, 2001 (first published 1998).

21 Kornicki, op. cit. (20), pp. 43–7. See also Susan Cherniack, 'Book culture and textual transmission in Sung China', *Harvard Journal of Asiatic Studies* (June 1994) 54(1), pp. 5–125; Cynthia J. Brokaw and Kai-Wing Chow, eds., *Printing and Book Culture in Late Imperial China*, Berkeley: University of California Press, 2005.

22 See the entry for 書 in Morohashi Tetsuji, ed., *Dai Kan-Wa jiten*, Tokyo: Taishūkan Shoten, 1990–2001.

23 Initially compiled before the fourth century BCE of unknown (or contested) authorship, 'four books' were submitted to subsequent systematizations and institutionalization in the Han and Song periods and consolidated as the foundation of the system of civil examinations in imperial China. They should not be regarded as stable texts, as not only did their content change over time, but also they were inseparable from their commentaries. See Daniel K. Gardner, *The Four Books: The Basic Teachings of the Later Confucian Tradition*, Indianapolis: Hackett, 2007; and Michael Nylan, *The Five 'Confucian' Classics*, New Haven, CT: Yale University Press, 2001. On their socio-intellectual importance within the context of the civil examinations see Benjamin Elman, *A Cultural History of Civil Examinations in Late Imperial China*, Berkeley: University of California Press, 2002.

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location of the books they learned by within the hierarchical structure of a particular 'textual institution'. The epistemological authority and 'success' of a text, therefore, depended on its position within a particular 'textual institution', independently of whether it circulated in manuscript or printed form. In the case of *honzōgaku*, Tokugawa 'books' on nature studies took a variety of forms. They ranged from multi-volume encyclopedias (*ten*) to single- or multi-volume monographs (*fu*, *zue*, *zui*) in both printed and manuscript forms, albums of loose pages that could be constantly rearranged (*fu*, *chō*), large single-page charts (*zu*), and notebooks (*chō*) that circulated within different scholarly networks.[24] These formats suggest different practical uses, different epistemological functions, and different positions in the *ordo cognoscendi* of the texts these books contained.[25] In short, I question the normative semantic value of the heuristic category of 'book' not so much on the ground of a material difference between the European codex and the Japanese *sōshi* (another term for 'bound book'). I am rather concerned with the connotations of stability of form, content and authorship that the English 'book' generically conveys – genealogically linked to early modern notions of authorship rather than to the materiality of the printed codex,[26] or deriving from the religious worship of the divine 'book' (*biblos*, the Bible)[27] – which risks projecting meanings that are alien to the Japanese textual tradition.

Canonical encyclopedias constituted the foundational texts that framed the entire cognitive enterprise of *honzōgaku* scholars. In an interpretive scenario in which canonical 'books' created hierarchically structured 'textual institutions', encyclopedias stood as inspiration for further research and as source of cognitive authority (terminology, taxonomy, style, aims, etc.). The term 'encyclopedia' here includes texts as diverse as dictionaries (Ch. *zidian*, Jp. *jiten*) and glossaries (Ch. *cidian*, Jp. *jiten*) as well as multi-volume works like *dadian* (Jp. *daiten*), which focused on terminology and had the structure of lexicons. The aim of these *dian* (Jp. *ten*) was to clarify the meaning of key terms in earlier texts, principally from the canonical 'Four Books and Five Classics'. An example of such dictionaries is the *Erya*, compiled between the fourth and second centuries BCE as a lexicon of the terms appearing in pre-Qin texts like the *Shijing*.[28] The *Erya* was imported and reprinted in early seventeenth-century Japan, and served as the basis for expanded re-editions, like Kaibara Ekiken's *Wajiga* (1694) and Arai Hakuseki's *Tōga* (1719).[29] 'Dictionary' is a somewhat improper description of these *dian*, since rather than offering abstract definitions of terms, they collected and anthologized illustrative quotes from

24 Nagatomo, op. cit. (13). See also Nagatomo Chiyoji, *Edo jidai no shomotsu to dokusho*, Tokyo: Heibonsha, 2001.

25 For a more comprehensive taxonomy see Marcon, op. cit. (6), pp. 72–7. For printed books see also Nakano, op. cit. (20).

26 See Martha Woodmansee and Peter Jaszi, eds., *The Construction of Authorship: Textual Appropriation in Law and Literature*, Durham, NC: Duke University Press, 1994; and Harold Love, *Attributing Authorship: An Introduction*, Cambridge: Cambridge University Press, 2002.

27 See Brian Cumming, 'The book as symbol', in Suarez and Woudhuysen, op. cit. (17), pp. 93–6.

28 The title, *Erya*, is difficult to translate. It has been rendered as 'the ready rectifier' by James Legge, 'progress towards correctness' by A. von Rosthorn, 'the semantic approximator' by Joseph Needham, and 'approaching elegance' by Victor H. Mair. According to Coblin, 'the interpretation of the title as something like "approaching what is correct, proper, refined" is now widely accepted'. W. South Coblin, '*Erh ya*', in Michael Loewe (ed.), *Early Chinese Texts: A Bibliographical Guide*, Berkeley: University of California Press, 1993, pp. 94–9. See also A. Von Rosthorn, 'The *Erh-ya* and Other Synonymicons', *Journal of the Chinese Language Teachers Association* (Fall 1975) 10(3), pp. 137–45; Victor H. Mair, '*Tzu-shu* or *tzu-tien*', in William H. Nienhauser (ed.), *The Indiana Companion to Traditional Chinese Literature*, vol. 2, Bloomington: Indiana University Press, 1998, pp. 165–72.

29 Marcon, op. cit. (6), p. 76. Copies of the *Erya* circulated in Japan from the seventh century and portions of it were used as textbook in the imperial academia (Daigakuryō) and reproduced in other encyclopedias, like Minamoto no Shitagō's *Wamyō ruijushō* (931–8). See Don Clifford Bailey, 'Early Japanese lexicography', *Monumenta Nipponica* (Winter 1960) 16(1), pp. 1–52.

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canonical texts.[30] Glosses could also derive from category books (Ch. *leishu*, Jp. *ruisho*), gazetteers (Ch. *difangzhi*, Jp. *chihōshi*), monographs (Ch. *pulu,* Jp. *furoku*), and agronomical treatises (Ch. *nongshu*, Jp. *nōsho*).[31] During the Tokugawa period, reference encyclopedias (*leishu*) from China and new ones authored by Japanese scholars circulated in growing numbers as the literate population expanded.[32] These could be digest editions of Confucian classics like the *Analects*, agronomical manuals like Wang Zheng's *Nongshu* (1313), topographical encyclopedias like Zhang Hua's *Bowuzhi* (about 290) and the *Shanhaijing*, and lexicographical dictionaries of different kinds, which circulated in manuscript and printed forms, complete and in parts, heavily edited and with original additions by Japanese scholars.[33] In the field of materia medica, works like *Honzō kōmoku* (a Japanese rendition of Li Shizhen's *Bencao gangmu* (Systematic Materia Medica) originally published in Nanjing in 1596 and continuously reprinted in Japan), Kaibara Ekiken's *Yamato honzō* (Japanese Materia Medica) (1709), and, to a lesser degree, *Shobutsu ruisan* (A Classification of All Things) – compiled by Inō Jakusui and completed by Niwa Shōhaku between 1715 and 1747 – became 'textual institutions' that provided both the spark for scholars' investigations and the ultimate legitimation of their cognitive claims.

Li Shizhen's *Bencao gangmu* maintained throughout the period the status of foundational canonical source of pharmacological knowledge and projected its authority onto the terminology, classificatory logic, research goals and style over two centuries of original investigations. Within the field of *honzō* studies, it upheld the status of most important 'textual institution' guaranteeing the authority of naturalists' work for the entirety of the period.[34] After its official introduction in Japan in 1607 by Hayashi Razan, the demand for copies of the encyclopedia soon surpassed the supply from Ming booksellers. Local reprints began in 1637 by Kyoto publisher Noda Yajiemon. Noda produced a new edition,

30 In the words of Bernhard Karlgren, the *Erya* 'is not a dictionary *in abstracto*, it is a collection of direct glosses to concrete passages in ancient texts'. Bernhard Karlgren, 'The early history of the *Chou Li* and *Tso Chuan* texts', *Bulletin of the Museum of Far Eastern Antiquities* (1931) 3, pp. 1–59, 46. See also Thomas B.I. Creamer, 'Lexicography and the history of the Chinese language', in Ladislav Zgusta, ed., *History, Languages, and Lexicographers*, Tübingen: Niemeyer, 1992, pp. 105–35.

31 See Wolfgang Bauer, 'The encyclopedia in China', *Cahiers d'histoire mondiale* (1966) 9(1), pp. 665–91; Michael Loewe, *The Origins and Development of Chinese Encyclopedias*, London, China Society Occasional Paper 25, 1987; Joseph P. McDermott, *A Social History of the Chinese Book: Books and Literati Culture in Late Imperial China*, Hong Kong: Hong Kong University Press, 2006; and Sakai Tadao, *Chūgoku nichiyō ruisho shi no kenkyū*, Tokyo: Kokusho Kankōkai, 2011. According to Endymion Wilkinson, 'about 600 *leishu* were compiled between the Wei (early third century AD) and the eighteenth century. Of these, 200 are extant today, and 10–20 are still used by historians'. See Endymion Wilkinson, *Chinese History: A Manual*, revised and enlarged, Cambridge, MA: Harvard-Yenching Institute Monograph Series 52, 2000, pp. 602–3.

32 On Chinese books imported in Tokugawa Japan see Ōba Osamu, *Edo jidai ni okeru Karafune mochiwatarisho no kenkyū*, Suita: Kansai Daigaku Tōzai Gakujutsu Kenkyūjo, 1967; Iwashita Tetsunori, *Edo no kaigai jōhō nettowāku*, Tokyo: Yoshikawa Kōbunkan, 2006. On the literacy rate of early modern Japan see Richard Rubinger, *Popular Literacy in Early Modern Japan*, Honolulu: University of Hawaii Press, 2007; Umihara Tōru, *Kinsei no gakkō to kyōiku*, Tokyo: Shubinkaku Shuppan, 1988.

33 As far as I am aware, there is no comprehensive survey of the circulation of Chinese and Japanese encyclopedias in early modern Japan. For further information see Marcon, op. cit. (6), pp. 72–86; and Carol Gluck, 'The fine folly of the encyclopedists', in Amy Vladeck Heinrich (ed.), *Currents in Japanese Culture: Translations and Transformations*, New York: Columbia University Press, 1996, pp. 223–51.

34 On the *Bencao gangmu* see Carla Nappi, *The Monkey and the Inkpot: Natural History and Its Transformations in Early Modern China*, Cambridge, MA: Harvard University Press, 2009; Georges Métailié, 'Des mots et des plantes dans le *Bencao gangmu* de Li Shizhen', *Extréme-Orient Extréme-Occident* (1988) 10, pp. 27–43; and Métailié, 'The *Bencao gangmu* of Li Shizhen: an innovation in natural history?', in Elizabeth Hsu (ed.), *Innovation in Chinese Medicine*, Cambridge, MA: Harvard University Press, 2001, pp. 221–61. On the history of the *Bencao gangmu* in Japan see Marcon, op. cit. (6), pp. 28–56; Mayanagi Makoto, '*Honzō kōmoku* no denrai to kinryōbon', *Nihon ishigaku zasshi* (1991) 37(2), pp. 41–3; Nishimura, op. cit. (5), vol. 1, pp. 106–8.

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with illustrations and new 'translation markings' (*kundoku*), in 1653. An expanded edition appeared in 1659 with new illustrations. Matsushita Kenrin issued an entirely new edition in 1669, soon updated in 1672, edited by the scholar Kaibara Ekiken. In 1714 Inō Jakusui edited a newly annotated version. Reissues of these early editions continued throughout the period, alongside abridged and partial ones. Alongside these reproductions, a constellation of glossaries and commentaries to the texts continued to be produced within the 'textual institution' of the *Bencao gangmu*. When, at the beginning of the nineteenth century, Ono Ranzan, by then the most celebrated naturalist of his generation, published the summa of his lifelong research on plants and animals, he entitled it *Honzō kōmoku keimō*, a 'clarification' (*keimō*) of Li Shizhen's encyclopedia.[35] In other words, the 'textual institution' of the *Bencao gangmu* in early modern Japan was structured as a hierarchy of texts that had in Li's work its architext, followed by annotated re-editions, commentaries and expansions like Ono Ranzan's, synopses and abridgements, monographs based on sections of the encyclopedias, glossaries like Hayashi Razan's *Tashikihen*, down to fieldnotes of individual naturalists that, as we shall see, were conceived as updates of Li's encyclopedia.[36] It is at the operational level of scholars' practices that we find texts like 'manuals' and 'handbooks'. These functioned as intermediaries between the canonical architext (the *Bencao gangmu*) and actual specimens of plants and animals. Some of them had a bibliographical life of their own and circulated as monographs. Their relations to the architextual source, however, were discernible in the bibliographical notes (*hanrei*) that opened them, in the nomenclature of plants and animals which followed the *Bencao gangmu* template, and in the style of presentation. To give but one example, Kaibara Ekiken, the author of the first 'original' Japanese encyclopedia of materia medica (*Yamato honzō*, 1709), published short monographs like *Saifu* (On Vegetables) (1704) and *Kafu* (On Flowers) (1698), similar in format to Chinese *pulu*, but with information taken for the most part from the *Bencao gangmu* (taxonomy, nomenclature and medicinal uses), with additions from interviews with peasants.[37] Through the eighteenth and early nineteenth centuries, it was not unusual for naturalists to publish such works, which enjoyed vast circulation with the growth of aficionado readers among the literate population.[38]

Other intermediary texts had different functions. Abridgements of canonical texts or specialized monographs served for training students or as pocket glossaries for quick use during field expeditions, especially towards the end of the Tokugawa period.[39] Others were conceived for quite specific functions: an example is the richly illustrated booklet *Honzō tsūkan shōzu* (Faithful Illustrations of *Honzō tsūkan*) (1853), published by Maeda Toshiyasu, lord of the Toyama domain, which selected medicinal herbs from the *Bencao gangmu* and was distributed to all villages of the domain with the aim of improving

35 Ono Ranzan, *Honzō kōmoku keimō*, 4 vols., Tokyo: Heibonsha, 1991–2. On Ono Ranzan and his work on *Honzō kōmoku* see Endō Shōji, *Honzōgaku to yōgaku: Ono Ranzan gakutō no kenkyū*, Tokyo: Shibunkaku Shuppan, 2003.

36 The notion of 'architext' is from Gérard Genette, *The Architext: An Introduction*, Berkeley: University of California Press, 1992.

37 Kaibara Ekiken, *Kafu, Saifu*, Tokyo: Yasaka Shobō, 1973. On Ekiken see Okada Takehiko, *Kaibara Ekiken*, Tokyo: Yoshikawa Kōbunkan, 2012. In the introduction of *Saifu*, Kaibara, op. cit. (p. 91), justified the writing of a 'lesser texts' in these terms: 'If we do nothing to improve our life, we would live like birds and beasts, and just wither like herbs and trees. My intention in writing this little insignificant book is not futile. I did not throw away jewels to collect stones, as the saying goes. I just wanted to add to peasants' knowledge in order to help them improve their lives even if just a little. That is why I am not ashamed, nor do I fear the criticism of all other great masters of the way'.

38 Marcon, op. cit. (6), pp. 166–72.

39 See, for example, the case of herbalist Uemura Saheiji in Matsushima Hiroshi, *Kinsei Ise ni okeru honzōgakusha no kenkyū*, Tokyo: Kōdansha, 1974, pp. 194–262. See also Ueno Masuzō, *Hakubutsugakusha retsuden*, Tokyo: Yasaka Shobō, 1991.

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the health conditions of his subjects.[40] These texts were 'handbooks' that gave precise instructions on how to cultivate, nourish and consume plants, herbs and, more rarely, animals. They mostly derived their information from canonical encyclopedias, but occasionally added information taken from direct or indirect experience of their authors.

Further removed from the canonical architext, but still within its 'textual institution', were the fieldnotes of various naturalists, handwritten on single sheets of paper and later collected into albums (*chō*). These could be the product of individual research, as Ono Ranzan's *Honzō kōmoku keimō*, but more often recorded the efforts of groups of scholars engaged in collegial observational practices.[41] These albums collected the notes, observations and identifications of naturalists. They usually consisted in a picture of the specimen of plant or animal; a few notes on measurements, appearance and circumstances of their acquisition; and occasionally the names of those naturalists who contributed to the drawing, measurements, descriptions and identification. These albums circulated among the members of a cultural circle but could also be copied by members of other groups and institutions.[42] Rarely, as in the case of Ranzan, they became parts of a published work. It was in this format that Tokugawa naturalists inserted the acquired information from Western books within the established cognitive order without causing major shocks to the 'textual institution' of the *Bencao gangmu*. Information acquired from 'Dutch books' did not, however, question or dismantle the cognitive apparatus of the *Bencao gangmu*'s 'textual institution', but merely supplemented it with further data. It would not be until after 1868 that the edifice of knowledge of *honzōgaku* would be reframed within a different paradigm.

One of the most recurring normative questions for the Japanese naturalist was the conciliation of Chinese names of plants and animals in Li Shizhen's *Bencao gangmu* – and, hence, the set of notions, symbols, explanations, uses and recipes that each name referred to – with plants and animals growing and living in Japan. Correct identification (or 'correct naming', *seimei*) for Tokugawa scholars consisted first and foremost in a lexicographical reconciliation of *Bencao gangmu* entries with Japanese names of species as they appeared in vernacular texts. Only later, towards the beginning of the eighteenth century, did *honzō* specialists become concerned with the semasiological problem of assigning the correct Chinese name to actual specimens that could be observed in the countryside or during public exhibitions (*yakuhinkai*) of specimens from private collections – thus indexing each specimen they observed within the taxonomical order of information and medicinal practices of the *Bencao gangmu*.[43] The content of Chinese canonical encyclopedias was at the same time flexible enough to accept updates, additions and changes, but resistant to radical subversions and paradigmatic shifts because, rather than being self-contained 'books', they subsumed the production of successive texts (commentaries, glossaries, fieldnotes, illustrated albums, etc.) within the hierarchically

40 *Honzō tsūkan shōzu* (Faithful Illustrations of *Honzō tsūkan*) (1853) was based on *Honzō tsūkan* (Compendium of Materia Medica), itself heavily reliant on the *Bencao gangmu*, which Toshiyasu had compiled the previous decade in manuscript form. Maeda Toshiyasu, *Honzō tsūkan*, Tokyo: Nihon koten zenshū kankōkai, 1937–43.

41 These heterogeneous texts have only recently attracted the attention of historians, in large part thanks to the activities of historians Isono Naohide, Sugimoto Tsutomu and Ōba Hideaki, who collected them in new archives housed, respectively, at the National Diet Library, in the rare books collection of Waseda University, and in the archives of the Koishikawa Botanical Garden of the University of Tokyo. See Isono Naohide (ed.), *Egakareta dōbutsu shoubutsu: Edo jidai no hakubutsushi*, Tokyo: Kinokuniya Shoten, 2005; and Ōba Hideaki (ed.), *Nihon shokubutsu kenkyū no rekishi: Koishikawa shokubutsuen 300 nen no ayumi*, Tokyo: Tokyo Daigaku Shuppankai, 1996.

42 Marcon, op. cit. (6), pp. 169–206.

43 Of key importance was the nationwide survey of natural species organized by the Tokugawa in 1726. See Federico Marcon, 'Inventorying nature: Tokugawa Yoshimune and the sponsorship of *Honzōgaku* in eighteenth-century Japan', in B. Walker, J. Thomas and I. Miller (eds.), *Japan at Nature's Edge: The Environmental Origins of a Global Power*, Honolulu: University of Hawaii Press, 2013, pp. 189–206.

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structured organization of a 'textual institution'. Rather than being immobile texts suitable only to be worshipped as foundational or destroyed as outdated and fallacious, these encyclopedias operated as encompassing institutions that gave not only authority and legitimacy to scholars' findings, but also an adjustable template that regulated their inquiries. If Umberto Eco remarked that, in early modern Europe, 'the cultivated person's first duty is to be always prepared to *rewrite* the encyclopedia' anew, in Japan scholars' first duty was to be always prepared to *revise* and update it.[44]

These encyclopedias played a fundamental regulative role in the cognitive labour of Tokugawa naturalists. Their status in the hierarchy of knowledge was so important that observational practices alone did not, in themselves, challenge or undermine the authority of canonical texts like the *Bencao gangmu*, at least until the nineteenth century. When facing a previously unobserved specimen of bird or fish, Tokugawa naturalists, rather than propose the discovery of new species (to which a new name should be attributed), either catalogued it as an 'unnamed species' (Ch. *wuming*, Jp. *mumei* 無名) or called the specimen with the name of the most similar species they could find in the encyclopedia.[45] Occasionally, the number of species that canonical encyclopedias contained could be expanded with attached leaves of paper or in successive expanded editions, but in most cases only if information about the new species was gathered from other books – Chinese, Japanese or Dutch, or Chinese translations of European texts.[46]

Textual hierarchy as epistemological hierarchy

If books stood at the beginning and at the end of scholar's observational practices, not all books had equal authority to support them. A precise hierarchy positioned texts and the relevance of their cognitive claims within a textual institution. Editing and commenting on canonical architexts like Li Shizhen's *Bencao gangmu* was the most prestigious and rewarding endeavour for scholars. For instance, when Ono Ranzan, the most celebrated *honzōgaku* scholar of his time, published the sum of his lifelong investigations of plants and animals, he framed his masterpiece as a 'clarification' of the *Bencao gangmu*. It was intended to be a radical update of Li Shizhen's masterpiece based on Ranzan's knowledge of a diverse ensemble of texts and on his own observations, but it followed the format of Confucian commentaries and never questioned the template and authority of Li Shizhen's work.[47] In the scholarly world of Tokugawa Japan, writing commentaries gave scholars more intellectual prestige than producing 'original' treatises. The relation of a canonical text to the corpus of its commentaries was so intimate that the palimpsest of meanings they created was inconceivable to break asunder.[48]

In addition to canonical sources, other texts accompanied scholars' practices. In performing field research and in teaching, Tokugawa naturalists could take advantage of other books, including smaller manuals, monographs or other scholars' fieldnotes and notebooks that circulated as manuscripts in different networks. These operated as intermediaries between canonical encyclopedias and the epistemological labour of scholars. As such, they had a lower status vis-à-vis canonical encyclopedias, their authority and content derivative from architexts like the *Bencao gangmu*. They existed at the margins of the canon, but at the same time they constituted alternative bottom-up pathways to the

44 Umberto Eco, *Serendipities: Language and Lunacy*, Orlando, FL: Harcourt, 1999, p. 21, added emphasis.

45 In Marcon, op. cit. (6), I mention the cases of tobacco leaves and the *Hyoscyamus niger* (p. 70) and the case of the tufted puffin and horned puffin (pp. 198–200). For other similar cases see Ueno, op. cit. (8).

46 See Nishimura, op. cit. (5), Maki Fukuoka, *The Premise of Fidelity: Science, Visuality, and Representing the Real in Nineteenth-Century Japan*, Stanford, CA: Stanford University Press, 2013, pp. 53–78.

47 Endō, op. cit. (35); and Ono, op. cit. (35).

48 Wajima Toshio, *Nihon Sōgakushi no kenkyūi*, Tokyo: Yoshikawa Kōbunkan, 1988.

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classics for students and amateurs. The most prominent of these manuals were abridgements, glossaries and popularizations of canonical texts. Some served as pedagogical tools that scholars used in their private academies or in the scholarly clubs they led. They circulated as 'lite versions' of pharmacopoeias, or glossaries that mapped their contents to facilitate and quicken their usage, especially for those amateurs and scholars who utilized encyclopedias to gather information on plants and animals for alternative purposes, like poetry, painting, calligraphy or simply entertainment.[49] Some manuals were pocket-sized abridgements of canonical texts that scholars brought with them in the field for quick perusal.

Abridgements, glossaries and notebooks were multimedia handbooks that supported scholars' training to 'see systematically'.[50] They were also quite unstable. Whether printed or manuscript, handbooks were highly personalized by individual users, who in turn shared their annotated copies with fellow members of their club. Sometimes the personal notebooks of the most prominent scholars circulated in manuscript form in multiple copies among their students. Such was the case of Ono Ranzan's *Clarifications*, which was copied for decades before being printed only towards the end of his life.[51]

Despite Kōkan's portrait of an empirically inclined Japanese scholar, before the nineteenth century observation alone rarely justified the updating of canonical encyclopedias. This was not only the case for those naturalists with an eminently lexicographical approach, like Niwa Shōhaku, Ono Ranzan or Kuroda Suizan, but also for those whom modern historians celebrated as the pioneers of proto-scientific empiricism: the Owari group that formed around Mizutani Hōbun and Itō Keisuke.[52] These were mid- to low-ranking samurai from the Owari domain and physicians from Nagoya who, at the turn of the nineteenth century, jointly formed a club called Shōhyakusha, or 'Society of the One Hundred Licks/Tastes', devoted to the study of local plants and animals, ostensively to investigate their medicinal properties.[53] Their notebooks, now collected in the Tokyo National Diet Library, reveal an encyclopedic reach and curiosity about plants and animals hardly containable within the objectives of materia medica.[54] Japanese historians of science like Ueno Masuzō, Sugimoto Tsutomu, Endō Shōji and Isono Naohide have argued for the significance of Shōhyakusha scholars because of their distinctive empirical approach

49 Marcon, op. cit. (6), pp. 83–6.

50 As Michel Foucault put it in the context of early modern Europe, 'Observation, from the seventeenth century onward, is a perceptible knowledge furnished with a series of systematically negative conditions'. Foucault believed that the practices developed by Linnaeus, Tournefort and Buffon had the scope of limiting and disciplining sensory experience: 'the area of visibility in which observation is able to assume its power is thus only what is left after these exclusions: a visibility freed from all other sensory burdens and restricted, moreover, to clack and white'. 'To observe, then', he added, 'is to be content with seeing – *with seeing a few things systematically*'. Foucault, *The Order of Things: An Archaeology of the Human Sciences*, New York: Vintage Book, 1994, pp. 132, 133, 134, emphasis mine. The style and format of low-tier texts that circulated among *honzōgaku* functioned in a similar way as a form of disciplined seeing. See Marcon, op. cit. (6), pp. 239–48.

51 Endō, op. cit. (35), pp. 180–236.

52 Yoshida Mitsukuni, *Nihon kagakushi*, Tokyo: Kōdansha Gaujutsu Bunkō, 1987, p. 286; Ueno, op. cit. (8), pp. 166–80; Kimura Yōjirō, *Edoki no nachurarisuto*, Tokyo: Asahi Sensho, 1988, pp. 194–200; Yabe Ichirō, *Edo no honzō: Yakubutsugaku to hakubutsugaku*, Tokyo: Saiensusha, 1991, pp. 176–90; Ueno, op. cit. (39), pp. 102–4, 134–8; Ōba Hideaki, *Edo no shokubutsugaku*, Tokyo: Seikōsha, 1997, pp. 171–86; Shimonaka Hiroshi (ed.), *Saishiki Edo hakubutsugaku shūsei*, Tokyo: Heibonsha, 1994, pp. 225–37. See also Yoshida Tadashi, 'Edo jidai no kagaku shisō', in Sueki Fumihiko, Kurozumi Makoto, Satō Hirō, Tajiri Yūichirō and Karube Tadashi (eds.), *Nihon shisōshi kōza*, vol. 3: *Kinsei*, Tokyo: Perikansha, 2012, pp. 297–330.

53 The name was understood at the time as an obvious reference to the legend of the mythical emperor Shennong, the 'divine husbandman', who was said to have created the 'fundamental herbs' (*bencao*, *honzō*) by licking them and thereby instilling healing properties. The legend was reported in most *honzōgaku* encyclopedias, including the preface of the *Bencao gangmu*. See Marcon, op. cit. (6), p. 29.

54 Isono, op. cit. (41).

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and for the interest that its members showed for Linnaean taxonomy and nomenclature, particularly evident in Hōbun's and Keisuke's personal relationship with Franz von Siebold, German physician and botanist employed as medic in residence for the Dutch government in Dejima between 1823 and 1829.[55] In truth, in late Tokugawa Japan they were no more prominent than other groups of *honzōgaku* practitioners and their penchant for accurate 'true-to-nature' illustrations was not different from that of other naturalists.[56] The main reason behind historians' attention to Shōhyakusha's activities is the belief that it was their interest in Western science that led them to adopt a more empirical approach, thus making them the precursors of modern Japanese scientists. In a sense, for modern historians they were the perfect embodiment of what Kōkan had advocated a few decades earlier.

Like many other cultural circles of the period, Shōhyakusha members met regularly to discuss and conduct research on plants and animals.[57] In addition to Chinese and Japanese encyclopedias, they used Western texts as source, which in itself was not unique: Ono Ranzan, a generation earlier, and the shogunal physician and apothecary Kurimoto Tanshū, their contemporary, both took information from European texts.[58] Shōhyakusha's main activities consisted in recording the results of collegial observations and discussions about specimens in illustrated albums that aimed at adding to the pharmacological knowledge of canonical encyclopedias and in organizing the public exhibition of specimens from private collections of all provinces. Like other coeval groups, they relied on observation (*jikken*) and accurate, true-to-nature pictorial representations of plants and animals (*shashin*), and the aims, terminology and professional self-fashioning was well within *honzōgaku* tradition. They never solicited the rejection of the established paradigm of knowledge in support of Siebold's Linnaean method, but rather strived to acquire new techniques for precise identification of natural species in order to exploit their healing and nutritional properties according to the recipes of the *Bencao gangmu*'s tradition, and thereby support the domainal Institute of Medicine and agricultural production of the province.[59]

Shōhyakusha scholars wanted to test information on plants and animals through collegial observational practices in the field and in public exhibitions that encouraged shared participation and open discussion among group members. They then developed pictorial representations ostensibly faithful to the observed plants or animals. These 'true-to-nature' representations, which they called *shashin*, had thus various functions: they conveyed the morphological characteristics of the observed specimen to aid in identification (thus substituting traditional verbal descriptions in Chinese encyclopedias) and recorded the collegial observations that justified that identification. Faithful renditions of actual specimens supported a complex epistemology, whereby images continuously

55 See Itazawa Takeo, *Shīboruto*, Tokyo: Yoshikawa Kōbunkan, 1960.

56 Marcon, op. cit. (6), pp. 179–206, 228–49.

57 Like many other cultural activities, in early modern Japan the study of plants and animals was undertaken in cultural circles. Variably known as *ren*, *kai*, *sha*, or *za*, these clubs were the dominant form of social organization of scholarly practices. Club activities, including regular meetings, public exhibitions, sessions of collegial observation of specimens and expeditions in the countryside, facilitated the exchange of specimens and information about newly imported exotic plants or animals between collectors, scholars and wealthy amateurs. Clubs constituted also the most important source of consumption and production of *honzōgaku* manuals. On the organization of cultural production in early modern Japan see Marcon, op. cit. (6), pp. 179–206; Tanaka Yūko, *Edo wa nettowāku*, Tokyo: Heibonsha, 1993; Tanaka Yūko, 'Cultural networks in premodern Japan', *Japan Echo* (April 2007) 34(2); Eiko Ikegami, *Bonds of Civility: Aesthetic Networks and the Political Origins of Japanese Culture*, Cambridge: Cambridge University Press, 2005; Ibi Takashi, *Edo no bunka saron: Chishikijin to geijutsukatachi*, Tokyo: Yoshikawa Kōbunkan, 2009.

58 On Tanshū see Shimonaka, op. cit. (52), pp. 189–208; and Ueno, op. cit. (39), pp. 81–6.

59 On the instrumentality of *honzōgaku* research for agricultural growth and increased exploitation of natural resources see Marcon, op. cit. (43); and Marcon, op. cit. (6), pp. 276–98.

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negotiated with multilingual texts, descriptions, observational practices and open debates with the aim of consolidating, rather than challenging, the taxonomical distinctions of species of the *Bencao gangmu*.[60] Shōhyakusha naturalists did not conceive of practices like observation and description as an alternative methodology aimed at substituting the acquired knowledge of canonical encyclopedias, nor did they conceive of Linnaeus's taxonomy, which they studied, as opposed to and irreconcilable with that of the *Bencao gangmu*, but simply as an alternative ordering system based on different but equally anthropocentric organizational principles.[61] They were not radicals or revolutionaries, as Japanese historians of science have tended to portray them, nor did they intend to obliterate the received *honzōgaku* knowledge. Hōbun and Keisuke rather utilized Western texts to correct and update the information contained in canonical sources. Established encyclopedias remained for them a valuable source of pharmacological information about the species of plants and animals they observed in nature and an unquestioned template for their taxonomical location. The sophisticated observational and descriptive techniques they developed served to more precisely match the plants they studied to the species treated in canonical encyclopedias, supplemented with information they gathered from Western sources.

The experimentations with multilingual texts, observational practices and illustrations of scholars like Hōbun and Keisuke happened at the level of notebooks and fieldnotes, which could circulate within and without the circle of Shōhyakusha naturalists. But because of the position of these texts within the dominant 'textual institution' of the *Bencao gangmu*, they complemented the architext without threatening a disavowal of its epistemological premises. The lavishly illustrated albums that naturalist clubs like the Shōhyakusha produced described plants, birds, shellfish and small mammals from the private collections of club members. These albums consolidated the canonical sources in processes of epistemological triangulation of observation, representation and reference to textual authority. The observation of new species, only after successive circulation in textual forms among naturalists, would eventually enrich the institutional framework of the *Bencao gangmu*.

Conclusions

The variety of texts that this essay has cursorily surveyed existed within a hierarchically structured 'textual institution', rather than forming a 'library' of related but independent, individual and equally authoritative 'books' on nature knowledge. At the top of the 'institution', an architext – in the case of *honzōgaku*, the *Bencao gangmu* – gave unity, terminology, authority and consistency to a constellation of texts that were connected to it in multiple and complex ways, with a degree of flexibility to legitimately accommodate changes, additions, corrections and experimentations that was inversely proportional to their proximity to the architext. The internal consistency of *honzōgaku*'s 'textual institution' largely derived from the sociological homogeneity of specialized scholars, the majority of whom were samurai at the service of shogunal and domainal administrations.[62] In addition, by the mid-eighteenth century, expertise in natural history was in expanding demand to sustain local production of drugs and to increase agricultural production.

60 Marcon, op. cit. (6), pp. 239–48.

61 Itō Keisuke, in *Taisei honzō meiso* (1829), explained the logic of Linnaean taxonomy without proposing the abandonment of the traditional system of the *Bencao gangmu* and its adoption. He rather argued for a coexistence that could be mutually advantageous. Itō Keisuke, *Taisei honzō meiso*, Nagoya: Nagoya Kyōiku Iinkai, 1982, p. 312. See also Endō, op. cit. (35), pp. 277–93.

62 Marcon, op. cit. (6), p. 179. See also Kagaku Asahi (ed.), *Tonosama seibutsugaku no keifu*, Tokyo: Asahi Sensho, 1991.

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The recruitment of naturalists within various kinds of state apparatus contributed to reducing the eclecticism that characterized *honzōgaku* in the first two centuries of the Tokugawa era.[63]

In early modern Japan nature knowledge began and ended with, and in between continuously referred to, books: more than in the wilderness of Japanese mountains, it was in the thick semantic forests of Chinese, Japanese and, later, Dutch encyclopedias and manuals that Japanese naturalists performed their fieldwork explorations. But these 'books' were not equal. Naturalists operated within a hierarchical 'textual institution' that provided methodology, agenda and authority to a constellation of texts ancillary to it. This institution was adjustable enough to incorporate additions, revisions and annotations. It was at the level of fieldnotes and research albums that historians today can appreciate the work-in-progress character of naturalists' labour. When published or copied by hand, notebooks took the form of 'annotations', 'clarifications' or 'addenda' to canonical texts. As 'fieldnotes', either actual notebooks provisionally bound or beautifully crafted illustrated albums, they occupied the lower tier of the 'institution', making them expandable 'works in progress' that added to the 'upper-tier' canons without menacing their status. The 'handbooks of nature' in which Tokugawa naturalists invested much of their cognitive labour took the form of an always-expanding 'Google doc', a sort of 'Wikipedia of nature', the constant development of which resulted from the collegial authorship of the community of scholars.

The lingering question is, then, how to understand Kōkan's allegorical representation of two different systems of knowledge, which anticipated historians' promotion of few *rangaku* scholars into precursors of a 'universal' science knocking at the doors of a benighted Japan in the form of Dutch books. The scroll and the codex in Figure 1 had the function of conveying, as metonymical vehicles that falsified the actual functioning of 'texts' among Tokugawa scholars, two opposing ideals of knowledge.

This ideological juxtaposition operates at two levels: the first opposes the scroll to the codex; the second opposes a closed book to an open one. The opposition of scroll and codex suggests an antagonism between the perceived obsolescence of the former and the innovation of the latter. On a literal level, the symbolic reduction of mainstream scholarship to a 'scroll' was a falsification of a system of knowledge that Kōkan surely knew very well, as he was schooled within the 'traditional' Confucian tradition and began reading texts dealing with Dutch studies quite late in life, in the 1780s.[64] As a consumer and producer of texts, Kōkan also knew that printed books for popular consumption and scholarly treatises both took the form of bound volumes (*sōshi*) similar to the codex. Throughout the Edo period, the majority of scholarly works circulated in manuscript form, which also took the form of a *sōshi* modelled upon commercial 'books'. Naturalists' notebooks (*chō*), too, were bound. By the seventeenth century, the scroll had been replaced in all activities but religious rituals (*sūtra*), and the Japanese word for 'scroll' (*maki*) was metonymically employed to refer to a 'volume', a 'section' or a 'part' of one book (*sōshi*). It was therefore as an open attack against tradition that the painting turns the scroll into a symbolic representation of learning, juxtaposing it to the codex as metaphor of backwardness – a view echoed by the squad of Chinese firefighters.

Furthermore, the representation of a closed scroll in opposition to the open codex suggests two distinct forms of learning which were ideologically juxtaposed in terms of obsolescence versus innovation. Traditional Chinese learning, here conceived as structured around mnemonic techniques that preserved the closeness and internal coherency of

63 Marcon, op. cit. (6), pp. 276–97.

64 Naruse Fujio, *Shiba Kōkan: Shōgai to gagyō*, 2 vols., Tokyo: Yasaka Shobō, 1995, vol. 1, pp. 79–108.

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its system of knowledge, is set against Western learning, representing the cutting edge of medicinal knowledge at least for those scholars and artists who, like Shiba Kōkan, were increasingly attracted to Dutch texts. The Western firefighters in the background have the semiotic effect of transferring to the open anatomical textbook connotations of efficacity and usefulness. The closed scroll indicated an intimate understanding of a cognitive system that was moral in character (the *ruyi* next to the scroll reinforces this connotation); in turn, the literatus embodied its epistemological and moral values, since he does not even need to unfold it. In contrast, the codex suggests a more pragmatic, instrumentalist attitude of problem solving, parallel to the image of the fire brigade, and the savant who spreads it open is probably engaged in an intellectual discussion that requires reference to the book, which is, contrary to the scroll, open and virtually accessible to all. The scroll embodied connotations of a sacred text, the codex of a how-to instruction manual; consequently, the former evoked the religious-like figure of the sage, the latter a man of learning pragmatically capable of intervening in the world for the benefit and progress of his community (a connotation also reinforced by the association of firefighters in the background). Hence the scroll and the Chinese sage behind it stood for an aristocratic conception of learning (as the team of Chinese firefighters following the guidance of one official), while the manual by the Western physician gave a sense of openness, accessibility and instrumentality.

The ideological message of Kōkan's painting unfolded through this series of idealized oppositions of views, values and ideals that falsified the actual conditions of scholarly production in late eighteenth-century Japan. It was a mystification of an intellectual tradition that had engaged with Western texts and was creatively experimenting with information gathered from multilingual texts. This was the case not only of *honzōgaku*, which this essay summarily introduced, but also of medicine: for instance, the school of Koihō ('ancient medical method') emphasized case studies to understand symptoms, etiology, diagnosis, medicament and prognosis of diseases as peculiar to each individual, rather than relying on deductive schema based on Zhu Xi metaphysics.[65] Similar methods of inductive analysis came to characterize the philological study of the Confucian canon, as the commentaries of thinkers like Itō Jinsai and Ogyū Sorai well evidenced.[66]

What Kōkan was probably reacting against was a series of censorial reforms carried out by the shogunal senior elder (*rōjū*) Matsudaira Sadanobu, today known as the 'prohibition of heterodoxy of the Kansei era' (*Kansei igaku no kin*), which targeted intellectual circles close to Kōkan. These consisted of a series of reforms carried out in the 1790s with the aim of 'restoring a then rather decrepit Confucian school, run by the Hayashi family in close association with the government and known loosely as Sage's Hall (Seidō), to a condition of strength and prestige not seen since its heyday at the end of the seventeenth century'.[67] The reform targeted mainly printed books and private academies who rivalled, both for number of students and for criticism of Zhu Xi's brand of Confucianism, the

65 See Marcon, op. cit. (6), pp. 107–8; Masayoshi Sugimoto and David Swain, *Science & Civilization in Traditional Japan*, Rutland: Charles E. Tuttle, 1989, pp. 279–90; Kosoto Hiroshi, *Kanpō no rekishi: Chūgoku, Nihon no dentō*, Tokyo: Taishūkan Shoten, 1999; Hattori Toshirō, *Edo jidai igakushi no kenkyū*, Tokyo: Yoshikawa Kōbunkan, 1978.

66 The bibliography on Tokugawa philology is quite extensive. Suffice to mention the recent Benjamin Elman, 'Sinophiles and Sinophobes in Tokugawa Japan: politics, classicism, and medicine during the eighteenth century', *East Asian Science, Technology, and Society* (2008) 2(1), pp. 93–121; and the classic Yoshikawa Kōjirō, *Jinsai, Sorai, Norinaga*, Tokyo: Iwanami Shoten, 1975.

67 Robert L. Backus, 'The Kansei prohibition of heterodoxy and its effects on education', *Harvard Journal of Asiatic Studies* (June 1979) 39(1), pp. 55–106, 55. See also Backus, 'The relationship of Confucianism to the Tokugawa Bakufu as revealed in the Kansei educational reform', *Harvard Journal of Asiatic Studies* (1974) 34, pp. 97–162. On the limited efficacy of the edict see Sudō Toshio, *Kinsei Nihon sekiten no kenkyū*, Kyoto: Shibunkaku, 2001, pp. 111–73.

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Hayashi school that the law deemed 'orthodox'. By 1792, the ban hit intellectual circles in which Kōkan had established closed associations. As a result, scholars who gravitated in cultural circles in which Dutch textbooks and Western pictorial techniques were appreciated found it prudent to dissociate themselves from figures like Shiba Kōkan who demonstrated an exaggerated interest in Western ideas.[68]

If the painting was realized after the ban, then it can be understood as a defense of a dominated field whose practitioners were hoping to find in Matsudaira Sadanobu a patron for their translations and research. In that case, the portrayal of the Chinese sage can be understood as an allegory of the anachronism of Zhu Xi's philosophy that the state was promoting at a time when most intellectuals of the period were distancing themselves from it. Most ironical of all, however, is its symbolic echoing of modern Japanese historians' desire to see *rangaku* scholars as pioneers of 'Western science', which, however, impeded acknowledging the similarities of naturalists' practices at the two extremes of the Eurasian continent.

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68 Hashimoto Hiroko, 'Shiba Kōkan no seiyō gahō ni yoru Nihon fūkeizu ni tsuite', *Kaikō toshi kenkyū* (March 2009) 4, p. 129.

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