A Woodblock's Career

Transferring Visual Botanical Knowledge in the Early Modern Low Countries

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Abstract

The Antwerp publishing house *Officina Plantiniana* was the birthplace of many important early modern botanical treatises. Throughout the sixteenth and seventeenth centuries, the masters of the press commissioned approximately 4,000 botanical woodblocks to print illustrations for the publications of the three Renaissance botanists – Rembert Dodoens, Carolus Clusius, and Matthias Lobelius. The woodcuts became one of the bases of early modern botanical visual culture, generating and transmitting the understanding of plants throughout the Low Countries and the rest of Europe. The physical blocks, which are preserved at the Museum Plantin-Moretus in Antwerp, thus offer a material perspective into the development of early modern botany. By examining the 108 woodblocks made for Dodoens' small herbal, the *Florum* (1568), and the printing history of a selected few, this article shows the ways in which the use of these woodblocks impacted visual botanical knowledge transfer in the early modern period.

Keywords

woodblocks – early modern botany – knowledge transfer

1 Introduction

In Antwerp in 1568, 108 woodblocks with images of ornamental and fragrant flowers were used for the first time to print the illustrations in the book *Florum, et coronariarum odoratarumque nonnullarum herbarum historia* (referred to as the 1568 *Florum* in this article).¹ Ordered by the printer-publisher Christophe

1 Rembert Dodoens, *Florum, et coronariarum odoratarumque nonnullarum herbarum historia* (Antwerp: Christophe Plantin, 1568).

Plantin (c. 1520–1589), the woodcuts complement the text of the small herbal, which was written and compiled by the Flemish physician and botanist Rembert Dodoens (1517–1585). This octavo-size herbal, mainly describing beautiful flowers and plants giving off a pleasant smell, was one of the first collaborations between Plantin and Dodoens.² The two individuals, along with two additional Netherlandish botanists, Carolus Clusius (1526–1609) and Matthias Lobelius (1538–1616), ushered in the new discipline of botany to the early modern Low Countries.³ The text and images in the 1568 *Florum* would later be reused in Dodoens' masterwork *Stirpium historiae pemptades sex* (1583) (addressed as the 1583 *Stirpium* in this article) and its various translations and re-editions in the late sixteenth and throughout the seventeenth centuries.⁴ The images – printed with the same blocks – would also appear in the treatises of Clusius, Lobelius, and other contemporary botanists, whose works were mostly published by Plantin or his successors at the *Officina Plantiniana* (Plantin Press).

Remarkably, the 108 woodblocks that were first used in the 1568 *Florum*, as well as close to 4,000 botanical blocks (inventory number HB 4047–HB 8049) mostly made for the trio of botanists, are still extant at the Museum Plantin-Moretus (MPM) in Antwerp.⁵ The contributors who commissioned the production of this large collection of botanical woodblocks are Antwerp publishers Jan van der Loe (?–1563), Christophe Plantin, and the successors of the *Officina Plantiniana* who published some of the most widespread and popular botanical treatises in the early modern period.⁶ The books not only established the Low Countries as an important center for early modern botany, but transmitted the representations and understandings of plants throughout many parts of Europe.⁷ As sixteenth- and seventeenth-century botanical treatises often

2 Francine de Nave, Dirk Imhof (eds.), *Botany in the Low Countries* (Antwerp: The Plantin-Moretus Museum/The Stedelijk Prentenkabinet, 1993), p. 104.

3 Ibid., pp. 40–41; Claudia Swan, "Illustrated Natural History," in *Prints and the Pursuit of Knowledge in Early Modern Europe*, edited by Susan Dackerman (Cambridge, MA: Harvard Art Museums, 2011), pp. 186–191: 186.

4 Rembert Dodoens, *Stirpium historiae pemptades sex* (Antwerp: Christophe Plantin, 1583).

5 For an introduction of the MPM woodblock collection, see Iris Kockelbergh, "The Rich Collection of Woodblocks of the Museum Plantin-Moretus and its Use in the *Officina Plantiniana*," in *Ulisse Aldrovandi. Libri e immagini di storia naturale nella prima età moderna*, edited by Giuseppe Olmi, Fulvio Simoni (Bologna: Bononia University Press, 2018), pp. 109–117.

6 For a general introduction of the important botanical books published in Antwerp, see Agnes Arber, *Herbals: Their Origin and Evolution*, 3rd ed. (Cambridge: Cambridge University Press, 1986), pp. 79–92; Wilfrid Blunt, William T. Stearn, *The Art of Botanical Illustration*, 2015 Edition (Suffolk: ACC Art Books, 2015), pp. 76–84.

7 De Nave, Imhof (eds.), *Botany in the Low Countries* (cit. note 2), p. 13; Claudia Swan, "The Use of Realism in Early Modern Illustrated Botany," in *Visualizing Medieval Medicine and*

reproduce images from existing visual sources, many of the illustrations in the works of the three Netherlandish botanists derive their plant depictions from herbals by German botanists Otto Brunfels and Leonhart Fuchs and Italian naturalist Pietro Andrea Mattioli. Likewise, the plant depictions in the three Netherlandish botanists' works were disseminated across Europe and were used by English and Danish authors.⁸ The MPM botanical woodblock collection is, therefore, noteworthy for its material preservation of the botanical visual culture in early modern Europe.

The 108 blocks from the 1568 *Florum* thus offer a different angle into the history of visual botanical knowledge from such a material perspective. Using the printed images, many dedicated scholars have clearly demonstrated how botany became its own discipline as a result of the publications of copiously illustrated early modern botanical books.⁹ What more can woodblocks bring to the table then? The blocks immediately generate several questions about their technical creation. For example, what were the tools used to make the woodblocks? Could the hands of the different cutters be identified? Such questions are worth investigating, but cannot be covered in-depth here. More implicitly, and perhaps more difficult to answer, is to what extent can these woodblocks bring further insight into the transfer of early modern plant knowledge? This object-oriented study thus explores the potential of considering woodblocks as historical evidence in understanding early modern botanical imagery. It examines the materiality of the 108 woodcuts and the botanical woodblock collection at the Museum Plantin-Moretus. This study then tracks the trajectory of the 108 blocks within the publishing history of the Plantin Press in the sixteenth and seventeenth centuries.¹⁰ More specifically, it follows the "career" of

Natural History, 1200–1550, edited by Jean A. Givens, Karen M. Reeds, Alain Touwaide (Aldershot: Ashgate, 2006), pp. 239–250: 245.

- 8 This culture of copying plant depictions is demonstrated by Erna Rice Eisendrath, "Portraits of Plants. A Limited Study of the 'Icones,'" *Annals of the Missouri Botanical Garden*, 1961, 48:291–327.
- 9 For examples, see Swan, "Illustrated Natural History" (cit. note 3); Swan, "The Use of Realism" (cit. note 7); Sachiko Kusukawa, *Picturing the Book of Nature: Image, Text, and Argument in Sixteenth-Century Human Anatomy and Medical Botany* (Chicago and London: University of Chicago Press, 2012); Brian W. Ogilvie, *The Science of Describing: Natural History in Renaissance Europe* (Chicago and London: University of Chicago Press, 2006).
- 10 The trajectory of the 108 blocks is part of the larger investigation on the printing history of every MPM botanical block that are associated with the three Netherlandish botanists (close to 4,000 in total). To achieve this daunting task, the image recognition program VGG Image Search Engine (VISE), created by the Visual Geometry Group at the University of Oxford, was employed to match a woodcut with its corresponding block. For more details on the applied methodology for this research, see Jessie Wei-Hsuan Chen, "Printing Matri-

FIGURE 1 Style 1, block HB 4331, 13.1×7.1×2.25 cm. (a) Recto view. (b) Verso view. (c) Printed impression from the MPM woodblock catalogue
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the block that printed the *Viola matronalis* (HB 4331) (Fig. 1) in the 1568 *Florum* to learn how the printing blocks affected the arrangement and dissemination of information.¹¹

2 The 108 Woodblocks of the 1568 *Florum*

The 1568 *Florum* is the second of the three small herbals that Dodoens and Plantin published in the early stage of their collaboration. Together with the first book, *Frumentorum* (1566, 1569), and the third *Purgantium* (1574), the three

ces as a Source: Studying the Botanical Woodblocks at the Museum Plantin-Moretus," *De Gulden Passer*, 2018, 96:245–259.

11 Arjun Appadurai and other authors explored the concept of an object's "career" by following the trajectory of and tracing the object's movement to understand its social context. Particularly, see Igor Kopytoff, "The Cultural Biography of Things: Commoditization as Process," in *The Social Life of Things: Commodities in Cultural Perspective*, edited by Arjun Appadurai (Cambridge: Cambridge University Press, 1986), pp. 64–91.

small herbals constitute the major content of Dodoens' 1583 *Stirpium*.¹² The 108 woodcuts feature original depictions of plants that appeared for the first time in a printed book.¹³ The volume includes common local flowers, such as violets, lilies, and roses; many sweet-smelling herbs, such as thyme and lavender; and rare flowers (particularly bulbous plants) recently introduced to the Low Countries from Asia Minor, such as tulips. The book contributed significantly to early botany by producing the first European description of the sunflower, then already popular in European gardens, which Dodoens named *Chrysanthemum Perunianum* to indicate its origin in Peru.¹⁴ As one of the earliest treatises concentrating on garden flowers, the book embodies the prevalent floriculture in the southern Low Countries. It also represents the beginning of modern botany by gradually moving away from the strong connection to medicine (a characteristic of the herbal tradition), as many of the plants have no clear medicinal properties.¹⁵ The 108 woodblocks that carry the plant depictions of these decorative flowers to accompany Dodoens' descriptions were all commissioned by Plantin specifically for this project. A slightly revised reprint appeared in 1569 under the same title, but with 109 illustrations. One image from the 1568 edition was replaced, five new woodcuts were added, four were omitted.¹⁶ This means that six woodblocks were commissioned for the 1569 print job, but no related archival document of these blocks has yet been found.

The logbook of the *Officina Plantiniana* documents the division of labor for the production of the 108 woodblocks and the 1568 *Florum*.¹⁷ The making of the blocks was a collective effort that took place outside the premises of the

12 Rembert Dodoens, *Frumentorum leguminum, palustrium et aquatiliū herbarum, ac eorum, quae eo pertinent, historia* (Antwerp: Christophe Plantin, 1566); Id., *Purgantium aliarumque eo facientium, tum et radicum convolvulorum ac deletariarum herbarum historiae libri IIII* (Antwerp: Christophe Plantin, 1574).

13 The word "original," in this article, simply refers to the first time when something was made or used with no judgment of artistic value.

14 De Nave, Imhof (eds.), *Botany in the Low Countries* (cit. note 2), p. 62; Anna Pavord, *The Naming of Names: The Search for Order in the World of Plants* (New York: Bloomsbury Publishing, 2005), p. 310.

15 Arthur K. Wheelock, Jr., *From Botany to Bouquets: Flowers in Northern Art* (Washington: National Gallery of Art, 1999), p. 25.

16 Marie-Thérèse Lenger (ed.), *Bibliotheca Belgica. Bibliographie générale des Pays-Bas*, 7 vols. (Brussels: Culture et civilisation, 1964–1975), Vol. 2, p. 214; Leon Voet, *The Plantin Press, 1555–1589: A Bibliography of the Works Printed and Published by Christopher Plantin at Antwerp and Leiden*, 6 vols. (Amsterdam: Van Hoeve, 1980–1983), Vol. 2, p. 829; De Nave, Imhof (eds.), *Botany in the Low Countries* (cit. note 2), p. 104; Claus Nissen, *Die botanische Buchillustration: Ihre Geschichte und Bibliographie*, 1994 reprint ed. (Mansfield: Maurizio Martino Publisher, 1994), p. 49.

17 All the payment records related to the production of the 1568 *Florum* are in Museum

Plantin Press. The Mechelen-based draftsman Peeter vander Borcht was paid 26 fl. 15st. on August 22, 1567, to create 107 figures for Dodoens' book. He later received another 15 st. for an additional three figures, which makes 5 st. for every drawing; in the end, only 108 figures were turned into woodblocks. Plantin also paid an unnamed carpenter 3 fl. 15 st. to prepare at least 100 planed woodblocks on June 22, but there is no further information on the wood source of the planed blocks. The woodcutters were paid slightly more than the draftsman. The Antwerp cutter Arnold Nicolai received 7 st. apiece, but later received an extra payment of 1 fl. 15st. He delivered seventy-one blocks between July 19 and October 18, 1567, and two more at the beginning of 1568. Gerard Janssen van Kampen in Breda was paid 20 fl. to cut twenty blocks on December 27 in 1567, which would make each block a high 20 st., almost three times more per block than what Nicolai received.¹⁸ The archival entries only amount to ninety-three woodblocks. It is unclear which cutter executed the remaining fifteen blocks, but it was most likely Van Kampen.¹⁹ The cost of each block comes down to a much more reasonable 11 st. if Van Kampen cut thirty-five blocks instead of twenty. There is no record of the number of the print run. As 800 copies were printed for the 1566 *Frumentorum* that Plantin and Dodoens embarked upon two years before, 800 would be a sensible number for the print run of the 1568 *Florum*.²⁰ The total production cost was a little over 80 fl. and each book was set at 6 st. for the sales price.²¹ This means that the 1568 *Florum* would have been a manageable investment for Plantin and its profit margin was considerably high.

At first glance, the 108 woodblocks display similar material properties. The majority of the blocks, including HB 4331, measure on average 13.1 × 7.1 × 2.25 cm, fitting into the standardized width of a column in an octavo-size book. However, there are several exceptions with smaller dimensions. The woodblocks are all cut on the plank side instead of on the end grain. Most of the images are cut almost to, if not on, the edges of the blocks. The wood for the 108 blocks are identified as pearwood (*Pyrus communis* L.), but specific variations

Plantin-Moretus, Antwerp, Arch 31, fol. 29, fol. 85, fol. 108, and are synthesized in Voet, *The Plantin Press* (cit. note 16), Vol. 2, p. 828.

18 Voet, *The Plantin Press* (cit. note 16), Vol. 2, p. 828; Lenger (ed.), *Bibliotheca Belgica*, Vol. 2 (cit. note 16), p. 213.

19 Voet also suggested that Van Kampen cut the rest of the 15, but there is no explanation of the reason behind this remark. See Voet, *The Plantin Press* (cit. note 16), Vol. 2, p. 828.

20 De Nave, Imhof (eds.), *Botany in the Low Countries* (cit. note 2), p. 44.

21 Ibid., pp. 41, 44.

are unknown.²² The use of pearwood is not surprising. Most surviving early modern woodblocks for European woodcuts are attributed as pearwood.²³ Literary sources also documented pearwood as one of the most suitable woods for printmaking.²⁴ Despite the occasional knots, pearwood planks have very even and smooth grain which easily accommodates delicate image details.²⁵ The wood density is soft enough to enable the cutters to work with relative ease, but hard enough to endure going under a press thousands of times without breaking.²⁶ As the term “woodcut” suggests, the blocks would have been primarily cut with a knife, but tools such as gauges, chisels, and saws could also be used to clean out larger recessed areas (the parts that are cut away) for the empty space in the background.²⁷ The blocks are overall very dark, with some close to black, and they have slightly shiny surfaces that reflect light. The backs of the blocks are inscribed (Fig. 1). With one exception, all 108 have a pasted piece of paper with writing from later centuries, and some have numbers in seventeenth-century handwriting inscribed directly onto the blocks. Several have numbers written on or carved into their sides. The six woodblocks made for the 1569 reprint do not differ in their material properties from those made for the 1568 *Florum*.

When taking a closer look at the front of the blocks, however, differences in the cutting techniques start to emerge, and two distinct cutting styles can be identified (Appendix 1). Block HB 4331 (Fig. 1) has a depth of around 0.3 cm in

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- 22 The identification research, conducted by wood conservators Charles Indekeu and Ellen Daneels in the early 2000s, concluded that the majority of the museum collection are cut from pearwood, with a few from boxwood (*Buxus sempervirens* L.); see Ellen Daneels, *De conservatieproblematiek van houtsneden- en houtgravureblokken* (Master's Thesis, University of Antwerp, 2006), pp. 83–84.
- 23 For example, most of the woodblocks exhibited in an important exhibition in 2005 on fifteenth-century printmaking are identified as pearwood, see catalogue entries in Peter Parshall, Rainer Schoch, *Origins of European Printmaking: Fifteenth-Century Woodcuts and Their Public* (Washington: National Gallery of Art, 2005).
- 24 See discussion in David Landau, Peter Parshall, *The Renaissance Print, 1470–1550* (New Haven: Yale University Press, 1994), p. 21; Eileen Reeves, “The Chiaroscuro Woodcut in the Early Modern Period,” in *The Structures of Practical Knowledge*, edited by Matteo Valleriani (Cham: Springer, 2017), pp. 189–221: 195–197.
- 25 Bruce T. Moran, “Preserving the Cutting Edge: Traveling Woodblocks, Material Networks, and Visualizing Plants in Early Modern Europe,” in *The Structures of Practical Knowledge*, edited by Matteo Valleriani (Cham: Springer, 2017), pp. 393–419: 409.
- 26 Adam Bowett, *Woods in British Furniture-Making 1400–1900: An Illustrated Historical Dictionary* (Wetherby: Oblong Creative, 2012), p. 183; Clive Edwards, *Encyclopedia of Furniture Materials, Trades and Techniques* (Farnham: Ashgate, 2000), p. 157.
- 27 Landau, Parshall, *The Renaissance Print* (cit. note 24), pp. 7, 23.

FIGURE 2 Style 2, block HB 6908, 10.5 × 4.1 × 2.1 cm. (a) Recto view. (b) Verso view. (c) Printed impression from the MPM woodblock catalogue
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its recessed area. The upper corners of the block are chiseled or gouged away, creating a ramp from the edge of the raised area to the edge of the block (Style 1). HB 6908 (Fig. 2), on the other hand, has a deeper cut, with the recessed area measuring approximately 0.5 cm deep. The offcut area is evenly cleared out, presenting a flat, clean, and smooth surface for the background (Style 2). The back sides of both Style 1 and Style 2 have sharp and straight edges. However, “duplicates,” or woodblocks with the same plant depiction (Fig. 3 and Fig. 4), were also found in the MPM botanical woodblock collection.²⁸ Out of the 108 woodblocks, thirty-one have two or three blocks with the same plant depiction,

28 The term “duplicate” is selected specifically for this project. In art history, an image or object made after an original would be called a copy. However, the same noun is considered a synonym for one item from the same print run in book history. As a result, the word

FIGURE 3 Style 3, block HB 7995, 11.2×4.15×2.3 cm. (a) Recto view. (b) Verso view. (c) Printed impression from the MPM woodblock catalogue
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and three out of the six 1569 additions have duplicates. Most of the duplicates were not made by the same hands or around the same time, as they show very different material qualities and cutting techniques. Within the duplicates, two more styles were identified. Block HB 7995 (Fig. 3), for example, demonstrates that blocks assigned as Style 3 use a variation of (pear)wood with a yellow-brown or ochre hue. The blocks are thicker than Styles 1 and 2 with an average thickness of 2.4 cm. The recessed areas are smooth, but not as flat and even as Style 2. The image area of Style 3 is also close to the edges of the block, and its back side has sharp and straight edges similar to Style 1 and Style 2. Style 4 is perhaps the most out of place one by comparison. Block HB 4924 (Fig. 4)

“duplicate” is chosen to best describe multiple blocks with the same depiction. “Copy,” in its verb form, is still used to describe the act of replicating in this article.

FIGURE 4 Style 4, block HB 4924, 11.6×5.7×2.1 cm. (a) Recto view. (b) Verso view. (c) Printed impression from the MPM woodblock catalogue
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shows that Style 4 is cut on slightly thinner planks with a reddish-brown color, and is overall thinner than the other styles (with some measuring as thin as 2 cm). There are highly visible gouge marks in the recessed areas, and the space between the edge of the image area and the edge of the block is generally wider on all sides. This implies that the measurement of the block is larger than the printed image, in contrast to Styles 1 and 2 that both have a closer measurement between the block and its printed counterpart. The backside edges of blocks attributed as Style 4 are cut into shallow angles as well. The identification of the four styles will be important to understand the printing history of the blocks in section 4 of this article.

3 The Growing Stock of Botanical Woodblocks at the *Officina Plantiniana*

Before delving into the trajectory of the 108 blocks and the career of HB 4331, it is important to have an overview of the entirety of the MPM botanical woodblock

collection, as the 108 blocks would be regrouped with many of them throughout their careers.²⁹ The 4,003 blocks from the museum collection were created over almost a century, with the majority of them commissioned by Plantin in the second half of the sixteenth century. The business records for the 1568 *Florum* already show that the price of one botanical block was not exorbitant, ranging between 12 st. to 17 st. for each of the 108 blocks. However, when hundreds to a couple thousands of blocks are needed for a print run of a copiously illustrated herbal, the accumulated cost of blocks can run high. It would be an investment to commission printing blocks and it could take years to assemble an extensive stock. Thus, the blocks would be important capital for the printer-publisher. Because Plantin (and his press) paid for the production of the blocks, the printer-publisher owned them in the material sense and the woodblocks have always been part of the possessions of the *Officina Plantiniana*.³⁰

The contributions by Plantin began with the publication of the three small herbals, including the 1568 *Florum*. Over the decades, approximately 2,500 new woodblocks were made for the books of Dodoens, Clusius, and Lobelius that were published by the *Officina Plantiniana* before the death of Plantin. In 1580, the printer-publisher purchased 250 blocks that were cut for Lobelius' 1571 *Stirpium adversaria nova* from his London colleague Thomas Purfoot.³¹ A year later in 1581, Plantin again purchased more than 800 woodblocks, made to illustrate Dodoens' early botanical books, from the widow of Jan van der Loe.³² The suc-

29 If not specified, the number of blocks provided in this part is based on the findings of data compilation for this research instead of existing primary and secondary textual sources. Historical documents and modern literature have different numbers and it is too complex to untangle here. The numbers given here represent the minimum of what was made. However, the numerical uncertainty should not prevent a basic understanding of the scale each person contributed to the collection of printing blocks.

30 The woodblocks of Ulisse Aldrovandi, on the other hand, are found to be part of the author's possession, see Caroline Duroselle-Melish and David A. Lines, "The Library of Ulisse Aldrovandi (†1605): Acquiring and Organizing Books in Sixteenth-Century Bologna," *The Library: The Transactions of the Bibliographical Society*, 2015, 16:133–161, p. 138.

31 Matthias Lobelius and Pierre Pena, *Stirpium adversaria nova* (London: Thomas Purfoot, 1571); Leon Voet, *The Golden Compasses: A History and Evaluation of the Printing and Publishing Activities of the Officina Plantiniana at Antwerp*, 2 vols. (Amsterdam: Vangendt & Co., 1969–1972), Vol. 2, p. 229. Most of the later sources quote this number when mentioning Plantin's purchase from Purfoot. There are more than 250 woodcuts in Lobelius' book, which means that Plantin might not have bought the whole stock from the London publisher.

32 Voet, *The Golden Compasses* (cit. note 31), Vol. 2, p. 229. Voet stated that Plantin bought one thousand blocks for this transaction. Fewer than 900 blocks were counted during this research, which indicates that some of the blocks might not have been for botanical treatises.

cessors of the Plantin Press added more than 350 blocks to the mix in the first half of the seventeenth century. All the contributions totaled more or less 3,900 blocks. Close to 200 of these blocks did not survive, but more than 200 duplicates are found in the collection. There are also around fifty blocks with images of plants that were not intended for the botanical treatises of the three Netherlandish botanists. Regardless, the number of close to 4,000 blocks marks one of the largest collections of botanical imagery in the early modern period and allowed the *Officina Plantiniana* to print numerous botanical publications during that time.

This substantial stock of woodblocks would spend over one century illustrating a total of fifty-one books that are associated with Dodoens, Clusius, and Lobelius. Following the printing of Dodoens' large herbals by different publishers, three major periods can be identified to show how the blocks progressed through their careers. The first generation of Dodoens' large herbal, the *Cruijdeboeck* (1554), which was intended to be a Dutch-language equivalent to Leonhart Fuchs' 1542 *De historia stirpium*, would mark the height of the Van der Loe period (1552–1570s).³³ Before the issuing of this book, Van der Loe printed smaller botanical atlases. With each atlas, he commissioned more woodblocks and accumulated his stock. The *Cruijdeboeck* is a collection of all the illustrations from these previous publications, but with much more textual information. The Plantin period (1560s–1590) follows a similar pattern at the beginning, publishing smaller herbals with fewer woodcuts and a smaller corpus of Dodoens' text before all of them were compiled into the second generation, the masterpiece of the botanist's large herbal in 1583. The 1583 *Stirpium* has an almost entirely different set of woodcuts and much more updated text than the 1554 edition. The strategy to make the blocks to illustrate Clusius' works is similar, as the collation of the botanist's complete works was not issued until 1601 and 1605.³⁴ The 1581 *Kruydtboeck* of Lobelius seems to be one exception.³⁵ Archival information is yet to be found, but more than 800 new images – presumably printed with newly made blocks – appeared in this volume.³⁶ This far exceeds most commissions of blocks by Plantin for one project. It is during the

33 Leonhart Fuchs, *De historia stirpium commentarii insignes* (Basel: Michael Isingrin, 1542); Rembert Dodoens, *Cruijdeboeck* (Antwerp: Jan van der Loe, 1554).

34 Carolus Clusius, *Rariorum plantarum historia* (Antwerp: Officina Plantiniana, 1601); Id., *Exoticorum libri decem* (Antwerp: Officina Plantiniana, 1605).

35 Matthias Lobelius, *Kruydtboeck* (Antwerp: Christophe Plantin, 1581).

36 Voet, *The Plantin Press* (cit. note 16), Vol. 3, p. 1413. Voet did not find any record for this edition. Lobelius' 1576 *Plantarum, seu, Stirpium historia* also has a large number of new illustrations appeared, but many of those were probably intended for Dodoens' 1583 *Stirpium historiae pemptades sex*. Since Dodoens' was in Vienna, his masterpiece was delayed

Plantin period that the most well-known sixteenth-century botanical materials from the Low Countries, both images and text, were generated.

After the death of Plantin in 1589, his son-in-law, Jan I Moretus, took over the business in Antwerp from 1589 to 1610. Between 1610 and 1641, the Plantin Press in Antwerp would have a new master, Balthasar I Moretus. The succeeding master, Balthasar II Moretus, looked after the business from 1641 to 1674. Plantin's other son-in-law, Franciscus Raphelengius, would be in charge of the branch in Leiden (which he had managed since 1586) until 1597 when he passed away. The sons of Raphelengius, Franciscus II and Justus Raphelengius, continued the Leiden branch until 1619.³⁷ These successors of the *Officina Plantiniana* period (1590s–1640s) continued to print with the woodblocks, but primarily used them in posthumous re-editions of the three botanists' works instead of generating new materials. It is during this period that the Plantin Press printed the famous third generation of Dodoens' large herbal – the *Cruydt-Boeck* (1608, 1618, 1644), the Dutch translation of his 1583 masterpiece.³⁸ It was also during this period that the 108 blocks, along with most of the other botanical blocks, were shipped to London on a loan to the Englishmen Adam Islip, Joice Norton, and Richard Whitakers for the English herbal of John Gerard.³⁹ The last printing of the woodblocks was for a Danish herbal in 1647, after which the blocks went into retirement.⁴⁰ The 108 blocks from the 1568 *Florum* were created after

and Lobelius was able to include the illustrations first to offset the production cost of the blocks for Plantin, see De Nave, Imhof (eds.), *Botany in the Low Countries* (cit. note 2), p. 121.

37 Voet, *The Golden Compasses* (cit. note 31), Vol. 1, pp. 105, 115–116, 151, 172, 191, 202, 216.

38 Rembert Dodoens, *Cruydt-Boeck* (Leiden: Officina Plantiniana, 1608). The citation of Dodoens' large herbals is chaotic and inconsistent across the board depending on the scholars. The short titles in the chronology provided here are verbatim of their early modern copies. The differences in how the titles are spelled also aid in quickly placing specific print jobs of a block into the general timeline by referring to the three generations of Dodoens' large herbal.

39 John Gerard and Thomas Johnson, *The Herball, or, Generall Historie of Plantes* (London: Adam Islip, Joice Norton, and Richard Whitakers, 1633). For the account of printing the English herbal with the MPM woodblocks, see Dirk Imhof, "Return My Woodblocks at Once: Dealings Between the Antwerp Publisher Balthasar Moretus and the London Bookseller Richard Whitaker in the Seventeenth Century," in *The Bookshop of the World: The Role of the Low Countries in the Book-Trade, 1473–1941*, edited by Lotte Hellinga, Alastair Duke, Jacob Harskamp, and Theo Hermans ('t Goy-Houten: HES & De Graaf, 2001), pp. 179–190.

40 Simon Paulli, *Flora Danica: Det er: Dansk Urtebog* (Antwerp: Officina Plantiniana, 1647). There are two anecdotes about the blocks after they retired. In 1659, Balthasar II had an idea to sell the entire botanical collection, with 3,180 recorded at the time. For historical value, it was fortunate that the negotiation fell through and the blocks have been able to remain at the *Officina Plantiniana*. In the nineteenth century, one of the Moretus offspring thought about reprinting with the blocks, but, by then, woodworms had already gotten

the Van der Loe period and their careers followed the trajectories of the Plantin and *Officina Plantiniana* periods. The next part will therefore focus on how the blocks were used during the two later periods.

4 Reuse, Recycle, Repeat, and Replace

To explain the “visual argument” in Leonhart Fuchs’ 1542 *De historia stirpium*, Sachiko Kusukawa has demonstrated how the German botanist insisted on a one-to-one correspondence between plants and their pictures. This was to disprove his opponent, Sébastien de Monteuix, who discredited the use of images in botanical text. Contemporary printers often used the same image for multiple plants within a publication. For example, Christian Egenolff, who Fuchs deemed a greedy publisher, used the same woodcut for the *Mercurialis* and the *Atriplex*, and the plant name *Gladiolus* appears for three different images. To Fuchs, the inclusion of woodcuts in Egenolff’s publications was not intended to communicate plant knowledge, but to use images as a way to gain profit.⁴¹ Therefore, by using a lifelike and solely-designated depiction for each of the plants he described, Fuchs refuted Monteuix’s dismay at the use of plant representations and set himself apart from his competitors in publishing botanical treatises. Dodoens did not seem to have such a strong intention for the same level of visual argument, but the woodcuts in his books are still crucial to fully appreciating his writings.⁴² The publication of the 1568 *Florum* generated a new visual language with the 108 blocks, as they present plant depictions which had not appeared in printed books before. Nonetheless, as soon as the 1569 second edition was under production, this visual language was no longer new.⁴³ With one exception, which will be returned to later in this section, the 108 blocks were not altered, and the representations of plants in the specific depictions

to the blocks and they became too damaged for commercial use. De Nave, Imhof (eds.), *Botany in the Low Countries* (cit. note 2), p. 43; Dirk Imhof, *De houtblokken van Dodoens* (Antwerp: Letter-kunde Press, 2017), p. 21.

41 Kusukawa, *Picturing the Book of Nature* (cit. note 9), pp. 113, 120.

42 Clusius critiqued that Dodoens’ illustrations were not accurate, but Dodoens did not seem to be too concerned by the problem. See Sylvia Van Zanen, *‘Een uitzonderlijke verscheidenheid’: Planten, vrienden en boeken in het leven en werk van Carolus Clusius (1526–1609)* (PhD Diss., Leiden University, 2016), p. 414.

43 William M. Ivins, Jr., *Prints and Visual Communication* (Cambridge, MA: Harvard University Press, 1953), pp. 14–17. Ivins argued that the printing technology allowed the same pictorial statements to be accurately repeated, distributing the same message to a wider group of audience.

by Peeter vander Borcht are fixed. From this point onward, the 108 woodblocks present visual information of their plants in this set way.

However, while the depictions of plants are pinned, the contexts in which they reappear are not. Woodcut is a relief printing technique, which enables an image to remain the same and different at the same time. Since woodblocks can be printed using the same hand press for printing lead types, they can be arranged and rearranged with the types into a printing forme (the layout of the page).⁴⁴ As Bruce T. Moran has asserted in his study, new meanings were generated in the early modern period to help revise and reshape people's reception of the natural world by situating the images within different text.⁴⁵ Moran exhibited how this was achieved through the botanical woodblocks that were first commissioned for Leonhard Thurneisser in the sixteenth century. In 1578, Thurneisser announced that he had 1,921 woodblocks containing images of foreign and domestic plants cut for his forthcoming ten-volume publication based on the ancient, Paracelsian, and magical uses of plants. The project was abandoned after the first volume, but the blocks remained.⁴⁶ In the early 1650s, Thomas Panckow found 1,363 of Thurneisser's blocks and used them to print the woodcuts in his book on the utilitarian properties of the plants. By changing the content of the text, Panckow steered the blocks away from depicting plants of curiosities and towards plants used for pragmatic functions.⁴⁷ Moran's work provides a useful model to examine the usage of the 108 blocks after their debut in the 1568 *Florum*. Building on the concepts of reusing and recycling, this article further identifies two additional Rs – repeating and replacing. This section thus explores the relations between the four Rs and the careers of the 108 woodblocks.

In general, the lives of the 108 woodblocks can be simplified into two stages: their making and printing. The participants of the making stage include the draftsman and the cutters. Clusius is known to have actively engaged in monitoring draftsman Vander Borcht as he drew the images for the woodblocks commissioned for his publications.⁴⁸ In contrast, there is little to no indication that Dodoens was as involved in the drafting process of the 108 blocks. Once the

44 This study adapts American spelling for terminology, with the exception of *forme*. The English spelling is selected to specifically emphasize the object of a printing forme.

45 Moran, "Preserving the Cutting Edge" (cit. note 25), p. 399. For further discourse on this topic, see especially Ogilvie, *The Science of Describing* (cit. note 9), pp. 192–208.

46 Moran, "Preserving the Cutting Edge" (cit. note 25), p. 394.

47 Ibid.

48 De Nave, Imhof (eds.), *Botany in the Low Countries* (cit. note 2), pp. 52–53. Several authors have also elaborated on the sketches provided by and the supervision of Clusius in the process of making his botanical illustrations. For examples, see Van Zanen, *Een uitzon-*

completed blocks were delivered to the *Officina Plantiniana*, they entered their “career,” or the printing stage. The typesetters, pressmen, and other workers in the printshop were the hands to handle the blocks and operate the practical aspects of the printing. However, Dodoens (and perhaps Plantin to an extent) would be the mind to determine how the blocks would be used within the content of each botanical publication. The botanists’ and/or the printer-publishers’ role in using the 108 woodblocks is the major consideration for this section. It should also be clarified that the scope of this section focuses on the (re)arrangement and (re)organization of information through woodblocks, rather than the botanical knowledge generated through descriptions or depictions of plants.

The 108 blocks have different career paths. While some have identical printing histories in the books in which they reappear, many do not. The number of times they were selected to illustrate botanical treatises also varies, with some printed their images in as many as seventeen publications, whereas others were used in as few as three. Even among the blocks that have the same CV, the order of their appearances often changes from publication to publication. The trajectories of the blocks show that their placement was constantly reconsidered by the botanists to present the information that was most fitted to their need at the time of printing. Take the specific case of woodblock HB 4331 (Fig. 1) (Table 1), for example. The printing history of the block shows that it printed the plant illustration in a total of seventeen publications throughout the sixteenth and seventeenth centuries. After its first print job for the 1568 *Florum*, HB 4331 was used again in 1569 for the re-edition of the book. The block was borrowed to illustrate three publications of Lobelius’ works in the 1570s and 1580s (and again in 1591) before it returned to its roots to print the plant depiction for Dodoens’ 1583 *Stirpium*. Clusius also selected HB 4331 to illustrate two editions of his Austrian *flora* in 1583 and again for his complete works in 1601.⁴⁹ The block resumed its job in the many reprints of the third generation of Dodoens’ large herbal throughout the first half of the seventeenth century, as well as illustrated the botanical treatises of English and Danish botanists, John Gerard and Simon Paulli. The block also traveled internationally to Leiden in the Northern Provinces and to London for a handful of publications. With the many print jobs the woodblock completed in the early modern period, the worldly HB 4331 is one of the most industrious blocks among its peers from the 1568 *Florum*.

derlijke verscheidenheid’ (cit. note 42), pp. 407–434; Ogilvie, *The Science of Describing* (cit. note 9), pp. 175–179.

49 Carolus Clusius, *Rariorum aliquot stirpium, per Pannoniam, Austriam, & vicinas quasdam provincias observatarum historia* (Antwerp: Christophe Plantin, 1583).

TABLE 1 Printing history of HB 4331

Publication Author/period	Page # Location	Plant name(s) Generation of Dodoens' large herbal
1568 <i>Florum</i> Dodoens/Plantin	24 Antwerp	VIOLA MATRONALIS N/A
1569 <i>Florum</i> Dodoens/Plantin	24 Antwerp	VIOLA MATRONALIS N/A
1576 <i>Plantarum ... historia</i> Lobelius/Plantin	175 Antwerp	VIOLA MATRONALIS / Damascena / Viola alba Tragi Weiss winter violen N/A
1581 <i>Kruydtboeck</i> Lobelius/Plantin	398 Antwerp	Viola Matronalis / Damascena / Viola alba Tragi Damast bloemen / Winter Violieren Weiss Winter Violen Violes des dames / Giroffles des Dames N/A
1581 <i>Plantarum ... icones</i> Lobelius/Plantin	323 Antwerp	Viola Matronalis / Damascena N/A
1583 <i>Stirpium ... sex</i> Dodoens/Plantin	161 Antwerp	Viola matronalis Second Generation
1583 <i>Rariorum ... stirpium</i> [I] Clusius/Plantin	336 Antwerp	Hesperis II N/A
1583 <i>Rariorum ... stirpium</i> [II] Clusius/Plantin	336 Antwerp	Hesperis II N/A
1591 <i>Icones stirpium</i> Lobelius/ <i>Officina Plantiniana</i>	323 Antwerp	Viola Matronalis / Damascena N/A
1601 <i>Rariorum ... historia</i> Clusius/ <i>Officina Plantiniana</i>	297 Antwerp	Hesperis III N/A
1608 <i>Cruydt-Boeck</i> Dodoens/ <i>Officina Plantiniana</i>	256 Leiden	Damas-bloemen / Mastbloemen Third Generation
1616 <i>Stirpium ... sex</i> Dodoens/ <i>Officina Plantiniana</i>	161 Antwerp	Viola matronalis Second Generation
1618 <i>Cruydt-Boeck</i> Dodoens/ <i>Officina Plantiniana</i>	239 Leiden	Damas bloemen / Mastbloemen Third Generation
1633 <i>The herball</i> Gerard and Johnson/Islip, Norton, and Whitakers	462 London	Viola Matronalis flore purpureo, siue albo Purple, or white Dames Violets N/A

TABLE 1 Printing history of HB 4331 (*cont.*)

Publication Author/period	Page # Location	Plant name(s) Generation of Dodoens’ large herbal
1636 <i>The herball</i> Gerard and Johnson/Islip, Norton, and Whitakers	462 London	Viola Matronalis flore purpureo, siue albo Purple or white Dames Violets N/A
1644 <i>Cruydt-Boeck</i> Dodoens/ <i>Officina Plantiniana</i>	239 Antwerp	Damas-bloemen / Mast-bloemen Third Generation
1647 <i>Dansk Urtebog</i> Paulli/ <i>Officina Plantiniana</i>	374 Antwerp	Viola matronalis N/A
Number of uses	17	

4.1 *Reuse*

What does “reuse, recycle, repeat, and replace” signify in the career of HB 4331, then? The act of reusing occurred through the reprints of Dodoens’ works. Dodoens’ publications mostly relied on editing and updating his previous works. *Frumentorum*, *Florum*, and *Purgantium* gave Dodoens the opportunities to generate new descriptions according to his own observations and studies of plants.⁵⁰ However, the 1583 *Stirpium* is predominantly a compilation of the three small herbals instead of a volume with previously undescribed plants. The 1608 *Cruydt-Boeck* and its many reprints is a translation of the 1583 *Stirpium* into Dutch, with the content largely reflective of the botanist’s original material in Latin. This reusing of Dodoens’ existing body of text parallels the reusing of the plant images. Most of the 108 blocks, with two exceptions (HB 7775 and HB 7960), follow a similar printing history as HB 4331, and were reused to print Dodoens’ works. However, reusing both the content of Dodoens’ writings and the mostly unaltered blocks from the 1568 *Florum* does not simply redistribute the exact same information. Dodoens rearranged the order of plants in the large herbal and updated and expanded the text. The Dutch translations of Dodoens’ 1583 *Stirpium* also opened the door for the botanist’s work to reach non-Latin readers. The reusing of the blocks brought new context to each republication of Dodoens’ works in seemingly subtle but impactful ways.

50 De Nave, Imhof (eds.), *Botany in the Low Countries* (cit. note 2), pp. 103–105; Ogilvie, *The Science of Describing* (cit. note 9), p. 143.

The rearrangement of the blocks allows space to include new information and, at times, assign plants into different groupings as the botanist revised his study of plants. Broadly speaking, the majority of the 108 woodblocks from the 1568 *Florum* and the six additions in 1569 are incorporated into the second part of the 1583 large herbal. The sub-title of this part, *De floribus, coronariis, odoratis, ac umbelliferis herbis*, indicates that the main focus of this part is a similar premise of fragrant and decorative flowers, but it is more expansive than the 1568 *Florum* in the species included. Many of the blocks were placed in their original order, but new blocks and plant descriptions were added in between. For example, the second part of the 1583 *Stirpium* starts with the woodcut of *Viola nigra siue purpurea*, the same plant name as the 1568 *Florum* and also printed with HB 6938. Previously, this was immediately followed by the woodcut of *Viola tricolor*, printed with HB 4547; in the 1583 *Stirpium*, two more blocks were inserted into the forme to print the plants *Viola flore multiplici* (HB 6298) and *Viola sylvestris inodora* (HB 6299). This enlargement of content situates blocks HB 6938 and HB 4547 in a larger pool of plant depictions with similar characteristics of form and utilitarian properties, and thus broadens the understanding of the *viola* category. Several woodblocks, however, are out of their original order and categorized into different groupings. Blocks HB 6350, HB 6911, and HB 4115 each depicts a type of iris. Originally, in the 1568 *Florum*, these images follow the *Asphodelus bulbosus Galeni* (HB 5482). In the 1583 *Stirpium*, the three plants appear much later in the book with almost forty pages and seventy woodcuts between them and HB 5482. In 1568, while Dodoens organized plants according to their formal characteristics, he did not assign groups for the plants; in the 1583 *Stirpium*, the three blocks of irises are now under the chapter of *De sylvestribus floribus, ac nonnullis aliis* (of wild flowers, and some others). Moreover, the changed order for block HB 5565 for the plant *Anemone (I)* places the plant even further into a different category. The plant depiction is now in part three, along with other root plants, herbs, poisonous plants, ferns, moss, and mushrooms. In other words, HB 5565 and its depiction of the *Anemone (I)* are now placed with more utilitarian plants instead of decorative and fragrant ones. Reusing the 108 woodblocks, but in different orders, allowed Dodoens to elaborate and reconsider his understanding and interpretation of the plants he studied.

The order of the blocks and their corresponding descriptions remain more or less the same in the Dutch translation of Dodoens' 1583 *Stirpium* and its several reprints. Nonetheless, the reusing of the blocks generates another type of meaning by pairing them with Dutch plant names in the 1608 *Cruydt-Boeck*, conceived by the publisher Franciscus II Raphelengius at the Leiden Branch after Dodoens' death. It has been argued that translation often alters meanings,

but it also enabled information and knowledge to be transferred from one place to another and thus reach a larger readership in the early modern period.⁵¹ Translating plant names, in particular, presented many difficulties.⁵² The first generation of Dodoens' large herbal printed by Van der Loe in 1554 is a Dutch publication, which was translated into French in 1557 and English in 1578.⁵³ While Dodoens significantly revised his descriptions in the three small herbals and subsequently in the 1583 *Stirpium*, the selections of plant species are still based on his early works. For example, in the 1554 *Crujdeboeck*, the Latin name *Violae Matronales* is already provided next to its Dutch name *Mastbloemen* for the woodcut, printed with HB 7090 (Fig. 5).⁵⁴ When Dodoens published the updated description for the same plant in the 1568 *Florum*, 1583 *Stirpium*, and their later reprints, the new depiction of the plant – printed with HB 4331 – took over from HB 7090 to represent the species, and the Dutch name was removed. The *Mastbloemen* returned in the 1608 *Cruydt-Boeck*, and the Latin name was dropped. Instead, another Dutch name, *Damas-bloemen*, was added to reveal another identity of the plant. This addition of the second Dutch name shows that the 1608 *Cruydt-Boeck* was not a reversal of its earlier context of the 1554 *Crujdeboeck*. Rather, it reflects a change in the understanding of the plant in the Dutch language, and demonstrated that there were multiple terms to refer to the same woodcuts yielded by HB 4331 at the beginning of the seventeenth century. As this posthumous Dutch edition of Dodoens' large herbal was pushed by the publishers with a more mass-market-oriented focus, the Dutch translation of the 1583 *Stirpium* made botanical knowledge approachable to the larger group of non-Latin readers outside the humanists' circles.⁵⁵ By being

51 Harold J. Cook, Sven Dupré (eds.), *Translating Knowledge in the Early Modern Low Countries* (Münster: LIT Verlag, 2012), p. 10.

52 As Florike Egmond has demonstrated, the sixteenth-century translation between Latin and vernacular plant names is complex and confusing to disentangle; see Egmond's chapter "Names of Naturalia in the Early Modern Period: Between the Vernacular and Latin, Identification and Classification," in Cook, Dupré (eds.), *Translating Knowledge* (cit. note 51), pp. 131–162.

53 Rembert Dodoens, Carolus Clusius (transl.), *Histoire des plantes* (Antwerp: Jan van der Loe, 1557); Rembert Dodoens, Henry Lyte (transl.), *A nieuwe herball, or, Historie of plantes* (Antwerp: Hendrik van der Loe for Gerard Dewes, 1578).

54 Page clxxxix in the 1554 *Crujdeboeck*. On the changing plant names, the project Plan-taardigheden documents the full list of plants and their several names in the three generations of Dodoens' large herbals, <https://leesmaar.nl/crujdeboeck/deel2/capitel005.htm> (accessed 9 Sept. 2019).

55 Maurits Sabbe, "Een en ander over Dodoens' Cruydtboeck-uitgaven van 1608 en 1618 en de Van Ravelingen's," *De Gulden Passer*, 1937, 15:89–106, p. 93. Vernacular and dialect names were associated with non-scientific knowledge and folklore, see Egmond, "Names of Naturalia" (cit. note 52), p. 132.

FIGURE 5 Block HB 7090, 12.7 × 7.1 cm. (a) Recto view. (b.) Verso view. (c.) Printed impression from the MPM woodblock catalogue
MUSEUM PLANTIN-MORETUS, ANTWERP – UNESCO WORLD HERITAGE,
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combined with Dutch plant names and descriptions, the reusing of the 108 woodblocks prolonged Dodoens' relevance and transferred the most up-to-date botanical knowledge into the vernacular in the 1608 *Cruydt-Boeck*.

4.2 *Recycle*

The recycling of the 108 woodblocks within the *Officina Plantiniana* refers to the use of the blocks in the publications of Clusius and Lobelius. As Table 1 shows, HB 4331 was employed to print woodcuts for three of Clusius' books and four of Lobelius'. Similar to the reusing of the blocks, recycling generated new contexts by rearranging and pairing the blocks with different textual information according to the visions of the botanists; however, recycling completed this goal to a much higher degree. By regrouping the blocks, the botanists developed their own systems of organization. For instance, Lobelius distinguishes

different groups by characteristics of the plants' leaves, in contrast to Dodoens' organization by utilitarian properties, thus creating a new approach to study plants.⁵⁶ Lobelius also brought the blocks into a more international context in the vernacular. His 1581 *Kruidtboeck* – which was already a Dutch translation of his 1576 Latin herbal, *Plantarum, seu, Stirpium historia* – recycled most of the 108 woodblocks.⁵⁷ One significant feature of the 1581 *Kruidtboeck* is the extensive index of plant names in Dutch, Latin, German, French, Portuguese, and English, compiled by the botanist from different sources.⁵⁸ The list of names in multiple languages is incorporated into the book to accompany almost every image. For the woodcut of HB 4331, three Latin names are provided: *Viola Matronalis* (referring to Dodoens' naming of the plant), *Damascena*, and *Viola alba Tragi*, as shown in Table 1. By making reference to Dodoens, Lobelius continues the dissemination of botanical knowledge generated by this botanist. Additionally, Lobelius noted that the plant is apparently called *Damast bloemen* and *Winter Violieren* in Dutch, *Weiss Winter Violen* in German, and *Violes des dames* or *Giroffles des Dames* in French. These plant names in foreign languages introduced readers in the Low Countries – at the very least – to how the plant of HB 4331 was identified by people from other European regions. The recycling of the 108 woodblocks, therefore, enabled Lobelius to transfer botanical knowledge by using a new way to group plants and various means to address them.

Clusius' recycling of the woodblocks shifted the international and geographical contexts of the blocks even more prominently. Generally speaking, the woodblocks commissioned for Clusius' works did not engage in the printing of Dodoens' or Lobelius' publications very often, and vice versa, because of the botanist's particular interest in exotic plants. Out of the 108 woodblocks, he selected fewer than half of them for his own works. Clusius' first recycling of the blocks was in 1583 for his Austrian *flora*, a genre consisting of descriptions of plants growing in a designated region. For the two editions of this title, only six out of the 108 blocks – including HB 4331 – from the 1568 *Florum* and one from the six 1569 additions were selected to illustrate the books.⁵⁹ HB 4331 is now referred to as *Hesperis II* and grouped with another block (missing or no

56 Arber, *Herbals* (cit. note 6), p. 91.

57 Matthias Lobelius, *Plantarum, seu, Stirpium historia* (Antwerp: Christophe Plantin, 1576).

58 Helena Wille, "Botanical Collectors and Collections in the Low Countries," in *Dodonaeus in Japan: Translation and the Scientific Mind in the Tokugawa Period*, edited by Willy F. Vande Walle, Kazuhiko Kasaya (Leuven: Leuven University Press, 2001), pp. 77–95: 80.

59 HB 4331, HB 5418, HB 6908, HB 6904, HB 6339, HB 4526, and HB 6334. Clusius, *Rariorum aliquot stirpium* (cit. note 49).

longer in existence) to illustrate the chapter on the *Hisperide* in both editions of the *flora*. Much like the 1568 *Florum*, the Austrian *flora* is a small botanical treatise publishing Clusius' original studies of plants. Serving as the second step (the first one being his Spanish *flora* in 1576) to his later complete works in 1601, the Austrian *flora* contains the botanist's observations of local plants growing in Austria, Hungary, and the immediate surrounding countries.⁶⁰ By using clear locations to describe the plants in their natural habitat, Clusius connects the plant depiction of HB 4331 to a well-defined geographical region. HB 4331 thus gained a new association with the particular areas of Austria, Hungary, and their neighboring countries, instead of only representing a plant from the Low Countries. The recycling of the 108 blocks in Clusius' works, therefore, expands the understanding of local plants from central Europe by situating the blocks in a new geographical context outside their original intention.

4.3 Repeat

The notions of reusing and, especially, recycling testify more prominently to the contributions of the botanists who generated new meanings using the unaltered visual information carried by the 108 woodblocks. On the other hand, the concept of repeating, the most complex use of the blocks in their careers at the *Officina Plantiniana*, can shed more light on the input of the publisher in botanical knowledge transfer. As previously elaborated, Fuchs criticized Egenolff for repeatedly using the same woodblock to print the same images for different plants. A similar repeat can be observed in the early botanical works of Dodoens, particularly in the first book he and Van der Loe published in 1552.⁶¹ For example, the same woodblock HB 7581 is used to illustrate both *Zea* and *Zeopyron*. The repeated use of HB 7581 for the two plants continues throughout almost every publication issued by Dodoens and Van der Loe, including the 1554 *Crujdeboeck* and its reprints, before the second generation of Dodoens' large herbal was materialized. Nonetheless, repeating a block to illustrate multiple plant names does not seem to be an economical act designed to maximize profits for the Antwerp publishers and botanists. Throughout the entire corpus of fifty-one publications printed by Van der Loe and the *Officina Plantiniana*, only a handful of such repeats can be found. The reason to repeat the few blocks for different plant names remains inexplicit, perhaps due to the lack of specimens from which to compose the depictions.

60 Carolus Clusius, *Rariorum aliquot stirpium per Hispanias observatarum historia* (Antwerp: Christophe Plantin, 1576); Voet, *The Plantin Press* (cit. note 16), Vol. 2, p. 673.

61 Rembert Dodoens, *De frugum historia, liber unus* (Antwerp: Jan van der Loe, 1552).

Rather, within the Plantin Press, repetition served a different purpose. The same depiction of the plant is repeated or copied without alteration on another block. HB 6908 (Fig. 2) and the two duplicates of the snowdrop image (HB 7995, Fig. 3; HB 4924, Fig. 4) from section 2 repeat the same depiction on three separate blocks. Of course, copying images or depictions is nothing new. It was a common practice in the early modern period. For example, 500 woodblocks were commissioned for Dodoens' 1554 *Crujdeboek* with depictions directly copied from Fuchs' 1542 *De historia stirpium*.⁶² Copying saved time and money by eliminating the composing phase altogether. It also shortened the drawing and transferring time, depending on the methods of transferring, if a publisher wanted to print an image but did not have the original block.⁶³ However, the duplicates in the MPM botanical woodblock collection indicate that the *Officina Plantiniana* had multiple blocks of the same depiction at their disposal at one point in the early modern period. If these duplicates were not made to maximize the repeating of a plant depiction for different plant names in the botanists' treatises, why are there duplicates? Furthermore, what does this repetition of certain plant depictions mean for the 108 blocks?

The thirty-one duplicates in the 108 woodblocks and the three from the 1569 additions mark the 1568 and 1569 *Florum* as the title with the highest percentage of duplicates from the whole MPM botanical woodblock collection. One hypothesis to explain the duplicates' creation is that certain blocks were employed so regularly for printing that a backup block might be needed when the original could not take the pressure of the press anymore.⁶⁴ Returning to HB 4331, the block was used for seventeen publications in total. If an average print run produced 800 copies at the Plantin Press, the block could have easily been placed under a hand press approximately 13,600 times. The high number of printed images yielded from a block makes the argument seemingly plausible. Nevertheless, woodblocks are very durable and can be used to print more impressions than one would expect.⁶⁵ Even after so many times under

62 Lucia Tongiorgi Tomasi, Tony Willis, *An Oak Spring Herbaria: Herbs and Herbals from the Fourteenth to the Nineteenth Centuries* (Upperville: Oak Spring Garden Library, 2009), p. 72. The authors wrote that some of the plants (most likely referring to the 500 images copied from Fuchs) were printed with the same blocks for Fuchs' 1545 Dutch edition. A close comparison between a selection of images has, however, not been able to confirm this, as all the studied samples show that they were printed by different blocks though the blocks for Dodoens' 1554 *Crujdeboek* were cut very closely to the original images.

63 Kusakawa, *Picturing the Book of Nature* (cit. note 9), p. 64.

64 De Nave, Imhof (eds.), *Botany in the Low Countries* (cit. note 2), p. 136.

65 Antony Griffiths, *The Print Before Photography: An Introduction to European Printmaking, 1550–1820* (London: The British Museum, 2016), pp. 60–61.

FIGURE 6 (a) Block HB 4115, 13.1×7.1 cm. (b) Block HB 4115, printed impression from the MPM woodblock catalogue. (c) Block HB 7844, 13.5×7.5 cm. (d) Block HB 7844, printed impression from the MPM woodblock catalogue
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the press, and after more than 400 years, HB 4331 is still in good condition. Despite some woodworm damage (which only became a problem in later centuries), the block shows no major cracks, and could still produce decent quality prints for the museum's woodblock catalogue in the second half of the twentieth century (Fig. 1). Moreover, the depictions that are repeated and duplicated in the collection appear to be somewhat arbitrary, with no clear pattern of why a depiction was made twice, or even three times. HB 4331 does not have a duplicate, and many depictions with duplicates did not appear in botanical treatises as regularly as HB 4331. The argument that duplicates were made to enable the continued printing of a particular depiction thus does not explain the existence of the repeated blocks at the Plantin Press.

A detailed comparison of the printed images in the botanical publications provided some clues to unravel the existence of the duplicates (Appendix 11). Overall, blocks with Style 1 and Style 2 are consistently used for the majority of the publications. Three sets of duplicates are cut in Style 1, but they were used alternatively throughout the sixteenth and seventeenth centuries. For example, HB 4115 and HB 7844 (Fig. 6) both repeat the depiction of an iris. This depiction appeared in fourteen publications, but twelve are printed with HB 4115 and two – the last two books in the chronology of the blocks' printing history – with HB 7844. Similar to HB 4331, HB 4115 and the other original blocks of the three sets are still in good condition. Repeating these depictions might have

been related to the practical issue of missing blocks in the Plantin Press. While the archival records are never explicit about which woodblocks the publishers were referring to, there are occasional mentions of re-cutting a block because the original one was not found at the time of printing.⁶⁶ Some of the duplicates might have been made because the original block was misplaced in storage or lost during transportation, but resurfaced after another block was made. Creating duplicate blocks supported the uninterrupted printing of the plant depictions, allowing the botanists to use the same representations of plants for their descriptions.

Another observation reveals that blocks cut in Style 3, including HB 7995 (Fig. 3), were used only in a translated edition of Dodoens' 1554 *Cruydeboek*. The book, with the text translated into English by the amateur botanist Henry Lyte, was printed by the widow and son of Van der Loe for the London publisher Gerard Dewes in 1578. It is known that this edition includes several images from the small herbals of Dodoens that were printed by Plantin, but it was unclear with what blocks Van der Loe's widow and son printed.⁶⁷ The material evidence in the museum collection and the confirmation from the printed images conclude that, instead of borrowing or loaning the original blocks from Plantin, Van der Loe's widow and son commissioned new blocks with the same depictions as Dodoens' small herbals, with most from the 1568 *Florum* and 1569 additions. The repeating of these depictions in the 108 blocks' careers happened for the same reason that the 500 woodblocks after Fuchs' plant depictions were copied. It carried the "aura" of the plant depictions from one publisher to another, and allowed the publishing house of Van der Loe to update the visual botanical knowledge generated by Dodoens in his early works. When Van der Loe's stock went to the Plantin Press in 1581, the printer-publisher and his successors gained access to two blocks with repeated visual information to potentially rotate or double the quantity of printing. However, the Plantin Press almost never used the botanical blocks from Van der Loe's publishing house. As the quality of linework is arguably higher in the original blocks for the 1568 *Florum*, Van der Loe's duplicates became obsolete and their ability to spread visual botanical knowledge diminished. Repeating, in the careers of the 108 blocks, was not intended to maximize profit for the publishers, but was a

66 Imhof, "Return My Woodblocks at Once" (cit. note 39), p. 186. Imhof mentioned that three woodblocks were lost when they were shipped back to Antwerp from London and Balthasar II had to have them recut. HB 4115 may be one of the missing blocks that somehow reappeared.

67 De Nave, Imhof (eds.), *Botany in the Low Countries* (cit. note 2), p. 105; Tongiorgi Tomasi, Willis, *An Oak Spring Herbaria* (cit. note 62), pp. 70–72.

practical strategy for them to obtain the depiction of a woodcut in order to continue or transmit the visual arguments of the botanists.⁶⁸

4.4 Replace

The first three Rs – reuse, recycle, and repeat – do not involve alteration of the woodblocks. The formes in which the blocks were placed and their relationship with text change every time and so generate new contexts, but the blocks themselves and the visual information they carry remain the same. However, the last R, replace, could potentially change the physical blocks. There are multiple ways to replace the visual information of a plant. When replacing occurs without altering the woodblocks, the entire plant depiction is removed. As previously mentioned, one image from the 1568 *Florum* was replaced in the 1569 edition. The *Lirioumanis* was completely removed, both image and text, and replaced by the *Iris bulbosa*. The block for the *Lirioumanis*, HB 7960, was not reused in any of Dodoens' works, recycled by Clusius and Lobelius, nor repeated into a duplicate for the botanical treatises printed by the Plantin Press.⁶⁹ Most often, however, the replacing of a block did not involve an elimination of a plant, but simply substituted a new block that carried a different depiction of the plant. For example, the plant name *Pseudodictamum* is illustrated by a now missing block in the 1553 *Trium priorum* by Dodoens and Van der Loe.⁷⁰ The next year, however, block HB 7174 replaced the missing block and was used for *Pseudodictamum* for the later publications by the duo. This type of replacing is especially prominent when Dodoens' large herbal transformed from its first to its second generation through his 1583 masterpiece, such as the case of HB 4331 (Fig. 1) replacing HB 7090 (Fig. 5) to portray the *Viola matronalis*. Two years after Plantin purchased the stock from Van der Loe's widow, the printer-publisher had all the blocks from Dodoens' 1554 *Crujdeboeck* at the time when printing the 1583 *Stirpium*. Nonetheless, much like the fates of Van der Loe's duplicates of Dodoens' small herbals, the majority of the stock was not used again. Plantin purchased the blocks not because he needed them to illustrate the plants, but to build a monopoly of the botanical printing blocks in the Low Countries to ensure the sales of his books.⁷¹ As the depiction of the *Viola matronalis* on

68 Woodblocks cut in Style 4, however, never appear in any of the printed books associated with the Plantin Press. There is not yet any documentation rediscovered to explain why these repeated depictions were materialized.

69 The block was, however, used to illustrate the "Whitish Floure de-luce" (p. 102) in the 1633 and 1636 versions of John Gerard's herbal when it was on loan in London.

70 Rembert Dodoens, *Trium priorum de stirpium historia commentariorum imagines ad vivum expressae* (Antwerp: Jan van der Loe, 1553).

71 Voet, *The Golden Compasses* (cit. note 31), Vol. 2, p. 229.

HB 4331 has more refined details than the depiction on HB 7090, replacing the woodcut with the block commissioned by Plantin increased the pictorial quality of the herbal.

When replacing takes place on the actual blocks, it means that part of the existing information was cut out of the block and new details were inserted. To do so, the woodcutter cut the unwanted part off, and then nailed another block with the needed information to the remaining block. To replace finer details on a block, the woodcutter removed the small section where change was required, placed a piece of wood of the same size, called a plug, to evenly fill the cutout area, and finally re-cut the details. Replacing details on a block comes with a risk. No matter how skillful the cutter was, the boundary of the alteration almost always shows, and the gap becomes more visible over time. Wood absorbs humidity or loses moisture depending on its environment, and the plug might shrink or expand at a different rate than the main block. Block HB 4912 was made for the plant *Batatas* in Clusius' 1576 treatise of the Spanish *flora*.⁷² A small but growing gap between the root and the viney stems can be spotted in the woodcut and its later reprints as a result of the small plug in the woodblock. Among the 108 woodblocks for the 1568 *Florum*, one experienced this type of replacing. Block HB 7993 was created to print the plant *Sisynrichium* in the 1568 *Florum*. The woodcut shows the full plant with an extra bulb on the bottom right corner. In the 1569 second edition, the same plant now has an additional fruit on the top right corner. An examination of HB 7993 (Fig. 7) shows that the top left corner of the block was cut away, leaving the block an irregular shape instead of a rectangle. A small block, HB 8007 (Fig. 7), was then created to fit into the cutout space. It replaced the void in the background of the original block with the visual information of the fruit and thus generated a new image. Although the two blocks always worked together to print all the later reprints of this plant depiction, HB 7993 and HB 8007 are not properly combined into one block. As a result, they were assigned two non-sequential inventory numbers in the collection, as their connection was not previously understood. In the careers of the 108 blocks, replacing information by altering the depiction on the actual blocks offered a means to generate new visual language with existing materials.

72 Clusius, *Rariorum aliquot stirpium per Hispanias observatarum historia* (cit. note 60), p. 298.

FIGURE 7 (a) *Sisynrichium* in Rembert Dodoens' 1568 *Florum*. (b) Block HB 7993, 12.6 × 7 cm. (c) Block HB 8007, 4.95 × 3.05 cm. (d) *Sisynrichium* in Rembert Dodoens' 1569 *Florum*

(A) MUSEUM PLANTIN-MORETUS, [HTTPS://ANET.BE/RECORD/OPACMMP/C:LVD:640036/N](https://anet.be/record/opacmmp/C:LVD:640036/N) (ACCESSED 9 SEPT. 2019); (B–C) MUSEUM PLANTIN-MORETUS, ANTWERP – UNESCO WORLD HERITAGE, SCANNED AND EDITED BY THE AUTHOR; (D) MISSOURI BOTANICAL GARDEN/BIODIVERSITY HERITAGE LIBRARY, [HTTPS://WWW.BIODIVERSITYLIBRARY.ORG/ITEM/37887](https://www.biodiversitylibrary.org/item/37887) (ACCESSED 9 SEPT. 2019)

5 Conclusion

The reusing, recycling, repeating, and replacing of the 108 woodblocks show the several ways in which these printing blocks were used to produce content for the botanical treatises at the *Officina Plantiniana* in the sixteenth and seventeenth centuries. By reorganizing and rearranging the blocks into new printing formes, information could be revised, updated, translated, and expanded. While this article has emphasized the changing contexts in which the woodblocks were situated, it should be noted that they remain, for the most part, pictorially unchanged. The duality of being the same and different at once generated a shared visual language. The printing of the woodblocks created hundreds to thousands of the same plant depictions. These printed counterparts of the blocks inherited their function as the carriers of the plant images. Working in tandem, the blocks and their impressions contributed to building the early modern visual culture of botanical imagery. The plant depiction of HB 4331 (Fig. 1) could be recognized in the early modern Low Countries, England, Denmark, and anywhere that the blocks' printed counterparts trav-

eled to, even though the names of the plant portrait differed in these regions. More importantly, perhaps, is the shared visual plant language facilitated by the repeating plant depictions. By copying the depictions of the 500 woodcuts from Leonhart Fuchs, Dodoens' book continued the visual argument of the German botanist, no matter how unintentionally. Likewise, by loaning the blocks from the Plantin Press or copying the plant depictions created for Dodoens, Clusius, and Lobelius, contemporary or later botanists shared the visual understanding of plants started by the three botanists.

At the end of this study, it is important to critically reevaluate to what extent these issues of visual botanical knowledge transfer reside in the woodblocks instead of the printed impressions. Arguably, many of the observations made in the last section could have been obtained by analyzing the printed images without the presence of a block. After all, most readers, historical or modern, of these early modern botanical treatises would never have encountered a printing block in their pursuit of plant knowledge. Woodblocks as historical evidence also require other kinds of documentation to properly understand them. Without the archival records from the Plantin business log, it would not have been possible to learn the division of labor and related costs for the production of the 108 woodblocks for the 1568 *Florum*. Studying the career of the 108 blocks within the scope of the entire MPM botanical woodblock collection has, however, answered many (albeit small) existing questions and made the practical issues in the process of printing botanical treatises at the *Officina Plantiniana* more easily understood. For example, as a group, blocks cut in Style 3 confirmed that the Van der Loe press indeed made a new set of blocks that copied flowering plant depictions from Dodoens' 1568 *Florum* for Lyte's English translation of Dodoens' *Crujdeboek* in 1578. The fact that these blocks were not used again in the later botanical treatises printed by the Plantin Press after becoming part of its stock in 1581 strengthens the existing understanding that Plantin would purchase woodblocks, punches for casting lead types, and other printing materials to gain monopoly in the industry. The decisions to use or not use certain blocks to print images might thus be for practical business reasons rather than ideological reasons linked to a book's content. Similar to any kind of historical evidence, woodblocks need to be taken with a grain of salt. Nonetheless, they bring a practical perspective into current discussions about early modern image making and knowledge transfer through the printed media.

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Appendix 1: Profiles of the 108 Woodblocks

This appendix records the physical measurements of each of the 108 blocks, the 1569 additions, and the duplicates. The blocks were not cut as even rectangles; therefore, the given measurements are approximate with the margin of variation usually within 0.3 cm. It also identifies the cutting styles based on the material properties of the woodblocks and in which ways they are worked. This appendix arranges the woodblocks in the order of their appearance in the 1568 *Florum* instead of in the order of the MPM inventory numbers. The original spreadsheet with raw data can be shared upon request.

Color code

	Duplicates (Two Shades for Easier Recognition)
	1569 Additions

Attributed cutting styles

Style	Wood color	Background	Backside
1	Dark	Semi Smooth	Clean Cut
2	Dark	Flat	Clean Cut
3	Yellow Brown	Smooth	Clean Cut
4	Red Brown	Clear Tool Mark	Edged

No.	Page no.	Plant name	Inventory no.	Height (cm)	Width (cm)	Thickness (cm)	Recessed area (cm)	Style	Note
1	13	Nigra siue purpurea viola	6938	7.6	7.1	2.2	0.2	1	
2	17	Viola tricolor	4547	11.9	7.1	2.2	0.25	1	
3	20	Leucoion candidum maius	6301	13.1	7.2	2.1	0.25	1	
4	21	Leucoion luteum	6303	13.1	7.1	2.2	0.3	1	
5	24	Viola matronalis	4331	13.1	7.1	2.25	0.3	1	
6	26	Viola latifolia bulbonac	6304	13.2	7.2	2.1	0.4	1	
7	28	Viola mariana	5937	13.1	7.1	2.2	0.3	1	
8	32	Ceruicaria maior	5933	13.1	7.15	2.1	0.25	1	
9	35	Viola calathiana	6131	11.8	5.1	2.2	0.4	2	
10	37	Campanula hortensis	5934	13	7	2.25	0.3	1	
11	41	Digitalis purpurea	4518	13.1	7.2	2.1	0.3	1	
12	43	Lychnis coronaria	4336	13.1	7	2.2	0.25	1	
13	46	Lychnis sylvestris	5616	13.1	7.15	2.25	0.2	1	
14	48	Nigellastrum	4094	13.2	6.4	2.2	0.35	1	
15	50	Cyanus flos frumentorum	4487	13.05	7.1	2.2	0.3	1	
15	50	Cyanus flos frumentorum	7808	13.6	7.6	2.1	0.2	4	
16	52	Cyanus maior	6352	13.1	7	2.2	0.2	1	
16	52	Cyanus maior	7866	13.5	7.7	2.1	0.25	4	
17	54	Flos regius	4650	13	7.15	2.1	0.2	1	
18	58	Calendula	4495	13.1	7.2	2.1	0.2	1	
19	61	Flos Aphricanus	6356	13.05	7.1	2.1	0.2	1	
19	61	Flos Aphricanus	7792	13.4	7.8	2.15	0.25	4	
20	65	Caryophylleus flos maior	5605	12.9	7.1	2.4	0.25	3	
20	65	Caryophylleus flos maior	6308	13	7.15	2.1	0.2	1	
21	69	Armerius flos primus	6312	13.1	7	2.15	0.2	1	
22	71	Armerius flos tertius	4417	13.1	6.2	2.1	0.25	1	
22	71	Armerius flos tertius	7817	13.1	6.4	2.4	0.3	3	
23	73	Flos Constantinopolitanus	4340	13	7.15	2.1	0.2	1	
24	75	Saponaria	6313	13.05	7.05	2.1	0.2	1	
25	77	Damasonium nothum	6314	13.1	7	2.3	0.3	1	
26	81	Aquileia	6315	13	7.3	2.2	0.25	1	
27	83	Antirrhinum	6316	13.2	7.25	2.15	0.3	1	
28	85	Antirr. sylvestre pleyteuma	6317	13.15	7.2	2.1	0.3	1	
29	88	Linaria	4379	12.95	7.15	2.1	0.2	1	
30	90	Amarantus purpureus	4269	13.1	7.1	2.1	0.2	1	
31	93	Rosa sativa	6319	13	7.05	2.2	0.3	1	
32	95	Rosa sylvestris	6320	13.15	7.1	2.25	0.2	1	
33	106	Cistus	6321	13.15	7.3	2.3	0.35	1	
34	111	Paeonia mas	4603	13.1	7.1	2.1	0.2	1	
34	111	Paeonia mas	6322	13.15	7.4	2.4	0.2	1	
35	113	Paeonia foemina prior	6323	13.1	7.3	2.15	0.2	1	
36	115	Paeonia foemina altera	6324	13.1	7.2	2.2	0.2	1	
37	119	Lilium candidum	4923	13.1	5.8	2.1	0.3	1	
38	122	Lilium purpureum maius	4925	13.1	5.1	2.15	0.35	2	

(cont.)

No.	Page no.	Plant name	Inventory no.	Height (cm)	Width (cm)	Thickness (cm)	Recessed area (cm)	Style	Note
39	124	Lilium purpureum minus	6931	10.8	5.05	2.1	0.4	2	
39	124	Lilium purpureum minus	7791	11.1	7.7	2	0.2	4	
40	127	Lilium sylvestre	4926	13.2	4.9	2	0.4	2	
41	129	Lilium non bulbosum	5418	13.2	7.2	2.2	0.3	1	
41	129	Lilium non bulbosum	7842	13.1	7	2.3	0.3	3	
41	129	Lilium non bulbosum	7849	13.3	7.7	2.1	0.3	4	
42	133	Lilium convallium	6180	10.5	7.7	2.05	0.3	4	
42	133	Lilium convallium	6927	10.2	6.85	2	0.35	1	
43	134	Unifolium	4993	9.6	7.65	2.1	0.4	4	
43	134	Unifolium	6933	9.4	6.6	2.3	0.2	1	
44	136	Asphodelus albus	5500	13.1	7	2.2	0.3	1	
45	139	Asphodelus luteus	6328	13	7.1	2.1	0.4	1	
46	141	Asphod. bulbosus Galeni	5482	13.05	7.1	2.1	0.35	1	
47	143	Iris	6350	13.2	7.3	2.2	0.2	1	
47	143	Iris	7848	13.6	7.85	2.2	0.25	4	
48	150	Chamaeiris	6155	10.8	6.3	2	0.2	4	
48	150	Chamaeiris	6911	10.8	6.6	2.1	0.4	2	
49	154	Pseudoiris	4115	13.1	7.1	2.2	0.2	1	
49	154	Pseudoiris	6894	13	6.2	2	0.2	4	
49	154	Pseudoiris	7844	13.5	7.5	2.3	0.2	1	
50	158	Gladiolus	6329	13	7	2	0.3	1	
51	160	Sisynrichium	4142	13.1	7	2.4	0.4	3	
51	160	Sisynrichium	7839	13.4	7.5	2	0.3	4	
51	160	Sisynrichium	7993	12.6	7	2.1	0.35	1	form one depiction
51	160	Sisynrichium	8007	4.95	3.05	2.1	0.3	1	
52	162	Liriohumanis	7960	13	5.6	2.1	0.2	1	
53	167	Hyacinthus non scriptus	5468	13.2	7.2	2.1	0.6	2	
54	170	Hyacint. neoter. primus	4151	13.2	7.2	2.1	0.3	1	
55	172	Hyacint. neoter. tertius	6333	13.05	7.05	2.2	0.3	1	
56	174	Hyacinthus autumnalis	4145	12.6	7.4	2.2	0.3	4	
56	174	Hyacinthus autumnalis	6134	11.3	7.1	2.1	0.3	1	
57	175	Hyacinthus Fuchsij	5480	12.5	7	2.2	0.35	1	
58	177	Bulbus leucanthemus	4173	13	7.1	2.15	0.2	1	
59	181	Narcissus medio purpur.	4155	13.5	7.3	2	0.3	4	
59	181	Narcissus medio purpur.	6335	13.2	7.2	2	0.5	1	
60	183	Narcis. medio luteus alter.	5438	13.1	7	2.5	0.4	3	
60	183	Narcis. medio luteus alter.	6336	13.1	7.1	2.2	0.35	1	
61	188	Narcissus iunifolius	6129	13.1	4.65	2.4	0.3	3	
61	188	Narcissus iunifolius	6910	13.1	4.9	2.2	0.3	1	
62	190	Narciss. luteus sylvestris	6893	11.3	6.5	2	0.4	1	
63	192	Leucoion bulb. triphyllon	4924	11.6	5.7	2.1	0.3	4	
63	192	Leucoion bulb. triphyllon	6908	10.5	4.1	2.1	0.5	2	
63	192	Leucoion bulb. triphyllon	7995	11.2	4.15	2.3	0.4	3	

(cont.)

No.	Page no.	Plant name	Inventory no.	Height (cm)	Width (cm)	Thickness (cm)	Recessed area (cm)	Style Note
64	194	Leucoion bulb. exaphyllon	5458	12.2	7.7	2	0.2	4
64	194	Leucoion bulb. exaphyllon	6904	11.65	6.2	2.1	0.45	1
65	195	Leucoion bulb. polyanth.	5460	13.4	7.6	2.1	0.3	4
65	195	Leucoion bulb. polyanth.	6339	13.2	7.2	2.05	0.5	2
66	197	Tulipa	7775	13.05	7.2	2.1	0.3	1
66	197	Tulipa	7846	13.2	7	2.4	0.5	3
67	198	Tulipa minor	5434	13.2	6.9	2.2	0.4	1
67	198	Tulipa minor	7790	13.1	7	2.4	0.4	3
67	198	Tulipa minor	7880	13.4	7.7	2.15	0.3	4
68	202	Cynosorchis altera	6342	13.2	7.1	2.1	0.45	2
69	206	Testiculus morionis mas	5585	13.2	7.15	2.1	0.4	2
70	207	Testiculus morio. femina	4927	12.8	6.5	2.1	0.4	2
71	209	Tragorchis, testic. hirci.	6344	13.1	6.6	2.1	0.3	1
72	211	Orchis serapias primus	7992	13.2	7.2	2.1	0.4	2
73	212	Orchis serapias secundus	6914	11.5	3.8	2	0.4	2
74	213	Orchis serapias tertius	6916	12.2	2.3	2	0.4	2
75	214	Orchis odor. testic. odor.	4936	10.9	2.5	2.3	0.3	1
76	217	Satyrium basilic. primum	6346	13.2	6.7	2.05	0.4	2
76	217	Satyrium basilic. primum	7864	13.7	7.6	2	0.25	4
77	218	Satyrium basilic. alterum	4208	13.2	7.45	2.2	0.25	4
77	218	Satyrium basilic. alterum	6347	13.2	6.8	2.2	0.6	2
78	221	Pseudorchis bifolium	4317	13.3	7.65	2.05	0.25	4
79	223	Tragopogon	4493	13.05	7	2.2	0.3	1
80	224	Scorzonera	5882	13.1	6.95	2.4	0.25	3
80	224	Scorzonera	6357	13.1	7	2.1	0.35	1
80	224	Scorzonera	7789	13.5	7.7	2.15	0.25	4
81	226	Chamaemelum vulgare	6358	13.1	6.35	2.25	0.2	1
82	229	Cotula alba	6359	13.1	7.05	2.1	0.2	1
83	233	Chamae. odoratum	6360	13	7.1	2.1	0.15	1
84	235	Eranthemum	4293	13.1	7	2.15	0.2	1
85	238	Buphthalmum	5652	13	7.05	2.1	0.3	1
85	238	Buphthalmum	7794	13.4	7.7	2.1	0.2	4
86	244	Chrysanthemum	5655	13.1	7	2.1	0.25	1
87	246	Bellis hortensis	4978	9.9	7.7	2.1	0.2	4
88	248	Elichryson	6364	13.2	7.3	2.25	0.3	1
89	250	Stoechas citrina	4440	12.9	7.1	2.15	0.2	1
90	253	Santolina	5663	13.05	7.1	2.1	0.2	1
90	253	Santolina	6365	13.7	7.25	2.1	0.25	1
91	256	Maiorana, siue marum	6366	11.8	7.1	2.1	0.2	1
92	260	Marum vulgare clinopod	5684	13	7.1	2.1	0.2	1
93	263	Lavandula	6368	13.05	7.1	2.1	0.2	1
94	266	Stoechas	4396	13.1	7.1	2.2	0.2	1
94	266	Stoechas	5666	13.4	7.7	2.1	0.25	4

(cont.)

No.	Page no.	Plant name	Inventory no.	Height (cm)	Width (cm)	Thickness (cm)	Recessed area (cm)	Style	Note
95	270	Serpillum vulgare	5019	8.05	7	2.1	0.2	1	
96	274	Ocimum	6371	13.05	7.15	2.1	0.3	1	
97	277	Ocimum sylvestre acinos	5682	13.2	7.1	2.05	0.2	1	
98	280	Oruala	4498	13	7.1	2.1	0.25	1	
99	283	Horminum	6386	13	7.15	2.1	0.15	1	
100	287	Balsamita maior	6387	13	7.1	2.1	0.2	1	
101	288	Balsamita minor	4329	13	7.1	2.1	0.2	1	
102	293	Anemone	5565	12.2	7.1	2.1	0.25	1	
103	295	Chrysanth. Perunianum.	6361	13.3	7.25	2.1	0.2	1	
103	295	Chrysanth. Perunianum.	7877	13.4	7.85	2	0.3	4	
104	299	Asphodelus palustris	4139	13.05	7.1	2.1	0.2	1	
104	299	Asphodelus palustris	7847	13.85	7.6	2.05	0.3	4	
105	301	Cirsion	4526	13.1	7.2	2.1	0.2	1	
106	302	Campana lazura	6451	12.95	7	2.2	0.2	1	
107	304	Panicum Indicum	6520	13.05	7	2.2	0.3	1	
108	306	Panacis species	6399	13	7.15	2.1	0.2	1	

No.	Page no.	Plant name	Inventory no.	Height (cm)	Width (cm)	Thickness (cm)	Recessed area (cm)	Style	Note
a	54	Cyanoides flos	6353	13.05	7.2	2.2	0.2	1	
b	112	Flos solis	5325	13.35	7.2	2.3	0.2	1	
c	167	Iris bulbosa	4141	13.3	7.05	2.35	0.4	3	
c	167	Iris bulbosa	5518	13.6	7.25	2.15	0.2	1	
c	167	Iris bulbosa	7840	13.4	7.6	2.1	0.3	4	
d	173	Hyacinthus orientalis	5463	13	7.3	2.1	0.3	1	
d	173	Hyacinthus orientalis	7836	13.15	7	2.4	0.25	3	
d	173	Hyacinthus orientalis	7906	13.15	7.7	1.7	0.25	4	
e	185	Ornithogalon maius	5481	13.1	6.9	2.4	0.3	3	
e	185	Ornithogalon maius	6334	12.9	7.3	2.1	0.3	1	
e	185	Ornithogalon maius	7899	13.4	7.65	2.05	0.3	4	
f	258	Aster atticus	5715	13.1	7.2	2.2	0.2	1	

Appendix 11: Identification of the Duplicates

This appendix identifies which block was used to print the woodcut in each book that contains the image. The original spreadsheet with raw data can be shared upon request.

Color code

	1569 Additions
	Both blocks are cut in Style 1. The darker blue is to more easily distinguish which block is used for which book.

Attributed cutting styles

Style	Wood color	Background	Backside
1	Dark	Semi Smooth	Clean Cut
2	Dark	Flat	Clean Cut
3	Yellow Brown	Smooth	Clean Cut
4	Red Brown	Clear Tool Mark	Edged

No. from Appendix 1 →	15	16	19	20	22	34
	4487 7808	6352 7866	6356 7792	5605 6308	4417 7817	4603 6322
Page No.	50	52	61	65	71	111
1568 <i>Florum</i> , Dodoens	4487	6352	6356	6308	4417	6322
Page No.	51	53	63	67	73	114
1569 <i>Florum</i> , Dodoens	4487	6352	6356	6308	4417	6322
Page No.	296		410	241	242	390
1576 <i>Plantarum ... historia</i> , Lobelius	4487		6356	6308	4417	4603
Page No.				154	155	
1578 <i>A nievve herball</i> , Dodoens				5605	7817	
Page No.	647		871	527	538	832
1581 <i>Kruidtboeck</i> , Lobelius	4487		6356	6308	4417	4603

(cont.)

No. from Appendix I →	15	16	19	20	22	34
Page No.	546		713	441	454	684
1581 <i>Plantarum ... icones</i> , Lobelius	4487		6356	6308	4417	4603
Page No.	250	250	254	174	176	194
1583 <i>Stirpium ... sex</i> , Dodoens	4487	6352	6356	6308	4417	6322
Page No.						
1583 <i>Rariorum ... stirpium</i> [I], Clusius						
Page No.						
1583 <i>Rariorum ... stirpium</i> [II], Clusius						
Page No.	546		713	441	454	684
1591 <i>Icones stirpium</i> , Lobelius	4487		6356	6308	4417	4603
Page No.				286	288	
1601 <i>Rariorum ... historia</i> , Clusius				6308	4417	
Page No.	423	424	432	278	284	317
1608 <i>Cruydt-Boeck</i> , Dodoens	4487	6352	6356	6308	4417	6322
Page No.	251	251	255	174	176	194
1616 <i>Stirpium ... sex</i> , Dodoens	4487	6352	6356	6308	4417	6322
Page No.	398	399	406	261	267	297
1618 <i>Cruydt-Boeck</i> , Dodoens	4487	6352	6356	6308	4417	6322
Page No.	732	732	750	588	601	980
1633 <i>The herball</i> , Gerard/Johnson	4487	6352	6356	6308	4417	6322
Page No.	732	732	750	588	601	980
1636 <i>The herball</i> , Gerard/Johnson	4487	6352	6356	6308	4417	6322
Page No.	398	399	406	261	267	297
1644 <i>Cruydt-Boeck</i> , Dodoens	4487	6352	6356	6308	4417	6322
Page No.	51		236			100
1647 <i>Dansk Urtebog</i> , Paulli	4487		6356			6322

No. from Appendix I →	39	41	42	43	47	48
	6931	5418	6180	4993	6350	6155
	7791	7842	6927	6933	7848	6911
		7849				
Page No.	124	129	133	134	143	150
1568 <i>Florum</i> , Dodoens	6931	5418	6927	6933	6350	6911
Page No.	128	133	137	138	147	154
1569 <i>Florum</i> , Dodoens	6931	5418	6927	6933	6350	6911
Page No.	84	47	87	161	32	34
1576 <i>Plantarum ... historia</i> , Lobelius	6931	5418	6927	6933	6350	6911
Page No.		204				
1578 <i>A nievve herball</i> , Dodoens		7842				
Page No.	206	127	212	372		97
1581 <i>Kruydtboeck</i> , Lobelius	6931	5418	6927	6933		6911
Page No.	167	92	172	303		69
1581 <i>Plantarum ... icones</i> , Lobelius	6931	5418	6927	6933		6911
Page No.	198	204	205	205	[243]	247
1583 <i>Stirpium ... sex</i> , Dodoens	6931	5418	6927	6933	6350	6911
Page No.		144				
1583 <i>Rariorum ... stirpium</i> [I], Clusius		5418				
Page No.		144				
1583 <i>Rariorum ... stirpium</i> [II], Clusius		5418				
Page No.	167	92	172	303		69
1591 <i>Icones stirpium</i> , Lobelius	6931	5418	6927	6933		6911
Page No.		137				230
1601 <i>Rariorum ... historia</i> , Clusius		5418				6911
Page No.	326	336	338	338	409	416
1608 <i>Cruydt-Boeck</i> , Dodoens	6931	5418	6927	6933	6350	6911
Page No.	198	204	205	205	[243]	247
1616 <i>Stirpium ... sex</i> , Dodoens	6931	5418	6927	6933	6350	6911
Page No.	305	314	316	316	384	392
1618 <i>Cruydt-Boeck</i> , Dodoens	6931	5418	6927	6933	6350	6911
Page No.	194	98	410	409		56
1633 <i>The herball</i> , Gerard/Johnson	6931	5418	6927	6933		6911
Page No.	194	98	410	409		56
1636 <i>The herball</i> , Gerard/Johnson	6931	5418	6927	6933		6911

(cont.)

No. from Appendix I →	39	41	42	43	47	48
Page No.	305	314	316	316	384	392
1644 <i>Cruydt-Boeck</i> , Dodoens	6931	5418	6927	6933	6350	6911
Page No.			74	147	70	
1647 <i>Dansk Urtebog</i> , Paulli			6927	6933	6350	

No. from Appendix I →	49	51	56	59	60	61
	4115	4142	4145	4155	5438	6129
	6894	7839	6134	6335	6336	6910
	7844	7993/8007				
Page No.	154	160	174	181	183	188
1568 <i>Florum</i> , Dodoens	4115	7993	6134	6335	6336	6910
Page No.	159	165	180	189	191	196
1569 <i>Florum</i> , Dodoens	4115	7993/8007	6134	6335	6336	6910
Page No.	[31]	50	53	60	60	62
1576 <i>Plantarum ... historia</i> , Lobelius	4115	7993/8007	6134	6335	6336	6910
Page No.		197			211	212
1578 <i>A nievve herball</i> , Dodoens		4142			5438	6129
Page No.	83	133	139	149	151	158
1581 <i>Kruydtboeck</i> , Lobelius	4115	7993/8007	6134	6335	6336	6910
Page No.	58	97	102	112	114	121
1581 <i>Plantarum ... icones</i> , Lobelius	4115	7993/8007	6134	6335	6336	6910
Page No.	248	210	219	223	224	226
1583 <i>Stirpium ... sex</i> , Dodoens	4115	7993/8007	6134	6335	6336	6910
Page No.						
1583 <i>Rariorum ... stirpium</i> [I], Clusius						
Page No.						
1583 <i>Rariorum ... stirpium</i> [II], Clusius						
Page No.	58	97	102	112	114	121
1591 <i>Icones stirpium</i> , Lobelius	4115	7993/8007	6134	6335	6336	6910
Page No.		216	185		154	159
1601 <i>Rariorum ... historia</i> , Clusius		7993/8007	6134		6336	6910

(cont.)

No. from Appendix I →	49	51	56	59	60	61
Page No.	419	347	362	372	373	378
1608 <i>Cruydt-Boeck</i> , Dodoens	4115	7993/8007	6134	6335	6336	6910
Page No.	248	210	219	223	224	226
1616 <i>Stirpium ... sex</i> , Dodoens	4115	7993/8007	6134	6335	6336	6910
Page No.	395	324	339	348	349	354
1618 <i>Cruydt-Boeck</i> , Dodoens	4115	7993/8007	6134	6335	6336	6910
Page No.	50	103	110	123	124	127
1633 <i>The herball</i> , Gerard/Johnson	4115	7993/8007	6134	6335	6336	6910
Page No.	50	103	110	123	124	127
1636 <i>The herball</i> , Gerard/Johnson	4115	7993/8007	6134	6335	6336	6910
Page No.	395	324	339	348	349	
1644 <i>Cruydt-Boeck</i> , Dodoens	7844	7993/8007	6134	6335	6336	
Page No.	111			89		
1647 <i>Dansk Urtebog</i> , Paulli	7844			6335		

No. from Appendix I →	63	64	65	66	67	76
	4924	5458	5460	7775	5434	6346
	6908	6904	6339	7846	7790	7864
	7995				7880	
Page No.	192	194	195	197	198	217
1568 <i>Florum</i> , Dodoens	6908	6904	6339	7775	5434	6346
Page No.	200	202	203	205	206	226
1569 <i>Florum</i> , Dodoens	6908	6904	6339	7775	5434	6346
Page No.	64	64	64	65	63	[90]
1576 <i>Plantarum ... historia</i> , Lobelius	6908	6904	6339	7775	5434	6346
Page No.	215			213	213	
1578 <i>A nierre herball</i> , Dodoens	7995			7846	7790	
Page No.	160	159	159		161	223
1581 <i>Kruydtboek</i> , Lobelius	6908	6904	6339		5434	6346
Page No.	123	123	122		124	188
1581 <i>Plantarum ... icones</i> , Lobelius	6908	6904	6339		5434	6346

(cont.)

No. from Appendix I →	63	64	65	66	67	76
Page No.	230	230	230		232	240
1583 <i>Stirpium ... sex</i> , Dodoens	6908	6904	6339		5434	6346
Page No.	182	180	184			
1583 <i>Rariorum ... stirpium</i> [I], Clusius	6908	6904	6339			
Page No.	182	180	184			
1583 <i>Rariorum ... stirpium</i> [II], Clusius	6908	6904	6339			
Page No.	123	123	122		124	188
1591 <i>Icones stirpium</i> , Lobelius	6908	6904	6339		5434	6346
Page No.	169	168	170		151	
1601 <i>Rariorum ... historia</i> , Clusius	6908	6904	6339		5434	
Page No.	384	384	385		388	404
1608 <i>Cruydt-Boeck</i> , Dodoens	6908	6904	6339		5434	6346
Page No.	230	230	230		232	240
1616 <i>Stirpium ... sex</i> , Dodoens	6908	6904	6339		5434	6346
Page No.	361	361	362		365	380
1618 <i>Cruydt-Boeck</i> , Dodoens	6908	6904	6339		5434	6346
Page No.	147	148	148	146	138	220
1633 <i>The herball</i> , Gerard/Johnson	6908	6904	6339	7775	5434	6346
Page No.	147	148	148	146	138	220
1636 <i>The herball</i> , Gerard/Johnson	6908	6904	6339	7775	5434	6346
Page No.	361	361	362		364	380
1644 <i>Cruydt-Boeck</i> , Dodoens	6908	6904	6339		5434	6346
Page No.		7				
1647 <i>Dansk Urtebog</i> , Paulli		6904				

No. from Appendix I →	77	78	80	85	87	90
	4208	4317	5882	5652	4978	5663
	6347	original block missing	6357	7794	original block missing	6365
			7789			
Page No.	218	221	224	238	246	253
1568 <i>Florum</i> , Dodoens	6347	1568-1	6357	5652	1568-2	5663
Page No.	228	231	234	248	256	266
1569 <i>Florum</i> , Dodoens	6347	1568-1	6357	5652	1568-2	5663
Page No.	[90]	161	298	456	253	436
1576 <i>Plantarum ... historia</i> , Lobelius	6347	1568-1	6357	5652	1568-2	5663
Page No.			166			
1578 <i>A nievve herball</i> , Dodoens			5882			
Page No.	223	372	651	959	561	920
1581 <i>Kruydtboeck</i> , Lobelius	6347	1568-1	6357	5652	1568-2	5663
Page No.	188	302	551	784	476	754
1581 <i>Plantarum ... icones</i> , Lobelius	6347	1568-1	6357	5652	1568-2	5663
Page No.	240	242	256	261	265	269
1583 <i>Stirpium ... sex</i> , Dodoens	6347	1568-1	6357	5652	1568-2	5663
Page No.						
1583 <i>Rariorum ... stirpium</i> [I], Clusius						
Page No.						
1583 <i>Rariorum ... stirpium</i> [II], Clusius						
Page No.	188	302	551	784	476	754
1591 <i>Icones stirpium</i> , Lobelius	6347	1568-1	6357	5652	1568-2	5663
Page No.			cxxxvii	333		341
1601 <i>Rariorum ... historia</i> , Clusius			6357	5652		5663
Page No.	404	407	435	444	451	459
1608 <i>Cruydt-Boeck</i> , Dodoens	6347	1568-1	6357	5652	1568-2	6365
Page No.	240	242	257	261	265	269
1616 <i>Stirpium ... sex</i> , Dodoens	6347	1568-1	6357	5652	1568-2	6365
Page No.	381	383	409	417	423	430
1618 <i>Cruydt-Boeck</i> , Dodoens	6347	1568-1	6357	5652	1568-2	6365
Page No.	220		736	746	635	1109
1633 <i>The herball</i> , Gerard/Johnson	6347		6357	5652	1568-2	6365

(cont.)

No. from Appendix 1 →	77	78	80	85	87	90
Page No.	220		736	746	635	1109
1636 <i>The herball</i> , Gerard/Johnson	6347		6357	5652	1568-2	6365
Page No.	381	383	409	417	423	430
1644 <i>Cruydt-Boeck</i> , Dodoens	6347	1568-1	6357	5652	1568-2	6365
Page No.			350			
1647 <i>Dansk Urtebog</i> , Paulli			6357			

No. from Appendix 1 →	94	103	104	c	d	e
	4396	6361	4139	4141	5463	5481
	5666	7877	7847	5518	7836	6334
				7840	7906	7899
Page No.	266	295	299			
1568 <i>Florum</i> , Dodoens	4396	6361	4139			
Page No.	279	307	309	167	173	185
1569 <i>Florum</i> , Dodoens	4396	6361	4139	5518	5463	6334
Page No.	234	322	47	48	54	[73]
1576 <i>Plantarum ... historia</i> , Lobelius	4396	6361	4139	5518	5463	6334
Page No.		191		198	206	205/644
1578 <i>A nievve herball</i> , Dodoens		1578-1 block missing		4141	7836	5481
Page No.	516	700	126	130	140	184
1581 <i>Kruydtboeck</i> , Lobelius	4396	6361	4139	5518	5463	6334
Page No.	430	592	92	94	104	149
1581 <i>Plantarum ... icones</i> , Lobelius	4396	6361	4139	5518	5463	6334
Page No.	274	264	208	211	216	221
1583 <i>Stirpium ... sex</i> , Dodoens	4396	6361	4139	5518	5463	6334
Page No.						186
1583 <i>Rariorum ... stirpium</i> [1], Clusius						6334
Page No.						186
1583 <i>Rariorum ... stirpium</i> [11], Clusius						6334

(cont.)

No. from Appendix I →	94	103	104	c	d	e
Page No.	430	592	92	94	104	149
1591 <i>Icones stirpium</i> , Lobelius	4396	6361	4139	5518	5463	6334
Page No.	344		198	210	174	186
1601 <i>Rariorum ... historia</i> , Clusius	4396		4139	5518	5463	6334
Page No.	473	449	343	349	359	368
1608 <i>Cruydt-Boeck</i> , Dodoens	4396	6361	4139	5518	5463	6334
Page No.	275	264	208	211	216	221
1616 <i>Stirpium ... sex</i> , Dodoens	4396	6361	4139	5518	5463	6334
Page No.	441	421	320	326	335	345
1618 <i>Cruydt-Boeck</i> , Dodoens	4396	6361	4139	5518	5463	6334
Page No.	586	751	95	99	112	167
1633 <i>The herball</i> , Gerard/Johnson	4396	6361	4139	5518	5463	6334
Page No.	586	751	95	99	112	167
1636 <i>The herball</i> , Gerard/Johnson	4396	6361	4139	5518	5463	6334
Page No.	441	421	320	326	335	345
1644 <i>Cruydt-Boeck</i> , Dodoens	4396	6361	4139	5518	5463	6334
Page No.						
1647 <i>Dansk Urtebog</i> , Paulli						