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Re-viewing the *constcamer*

A digital approach to seventeenth-century pictures of collections

1 Introduction

In 2019, 100 selected masterpieces of Dutch and Flemish art (ca. 1350–1750) were presented to the public and the art world as the CODART Canon. The final list had been compiled by members of the CODART international network of curators of Dutch and Flemish art, after a public vote.¹ No less than two *constcamer* paintings were included in the final selection: *The Five Senses* (1617–1619) by Jan Brueghel I and Peter Paul Rubens, which is actually a series of five paintings, and the *The Picture Gallery of Cornelis van der Geest* (1628) by Willem van Haecht II.² This demonstrates how popular *constcamer* paintings are among the public and art professionals.

A *constcamer* is a specific type of painting created mainly for the Antwerp art markets in the seventeenth century. It depicts a room with a rich collection of paintings, musical and scientific instruments, animals, plants, people, and many other interesting elements that were of significant cultural relevance for the period. Despite its popularity, the genre is not well researched, and no complete overview exists to this day.³ My PhD project aims not only to create a corpus of the *constcamer* paintings that have been preserved, but also to study their rich and complex content. This chapter explains the rationale behind the use of digital tools and methodologies to collect, archive, and analyze a dataset of over 160 *constcamer* paintings and the information relating to them.

1 “The CODART Foundation, “About the CODART Canon,” accessed September 28, 2020. <https://canon.codart.nl/about/>.

2 “The CODART Foundation, “100 Masterpieces,” accessed September 28, 2020. <https://canon.codart.nl/>.

3 The main reference work on the genre remains Simone Speth-Holterhoff, *Les Peintres Flamands de Cabinets d’Amateurs au XVIIe Siècle* (Brussels: Elsevier, 1957). For the historiography of the genre see Alexander Marr, “The Flemish ‘Pictures of Collections’ Genre: An Overview,” *Intellectual History Review* 20, no. 1 (2010): 5–25.

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2 Digital art history

In 2017, the lack of availability of datasets was characterized in the report on the symposium Art History in Digital Dimensions as “the primary obstacle for many art historians and students.”⁴ Creating datasets is currently the main work being done in the field of digital art history and, at the same time, an ongoing trend to digitize museum collections is contributing to the accessibility of artworks. “Yet even with these available resources,” the 2017 report continues, “the majority of researchers will have to develop their own dataset. For many, compiling this dataset has the potential to be more challenging than mastering new software.”⁵ It requires a way of working in which art historians are not usually trained.

Digital art history “has become a shorthand reference to the potentially transformative effect that digital technologies hold for the discipline of art history.”⁶ In the 2013 special issue of *Visual Resources* dedicated to digital art history, Drucker posed the controversial question, “Is There a ‘Digital’ Art History?” She proposed a distinction between *digitized* art history, characterized as making use of online repositories and images, and *digital* art history, where computational technology allows the use of analytic techniques.⁷ Computational analysis alone, however, cannot replace argumentation and interpretation.⁸ Subsequent research has shown that Drucker’s distinction no longer holds.⁹

4 Stephen Bury et al., “Art History in Digital Dimensions: The White Paper” (Washington DC: Frick Art Reference Library, 2017), 11, accessed June 17, 2021, <http://dah-dimensions.org/report/>.

5 Bury et al., “Art History in Digital Dimensions,” 11.

6 The Getty Foundation, “Digital Art History,” accessed September 28, 2020, <https://www.getty.edu/foundation/initiatives/current/dah/>.

7 Johanna Drucker, “Is There a ‘Digital’ Art History?,” *Visual Resources* 29, nos. 1–2 (2013): 7; Benjamin Zweig, “Forgotten Genealogies: Brief Reflections on the History of Digital Art History,” *International Journal for Digital Art History* 1 (2015): 37–49; and Anna Bentkowska-Kafel, “Debating Digital Art History,” *International Journal for Digital Art History* 1 (2015): 51–64.

8 Claire Bishop, “Against Digital Art History,” *Humanities Futures*, Franklin Humanities Institute, 2017, accessed September 20, 2020, <https://humanitiesfutures.org/papers/digital-art-history/>. According to Hans Brandhorst the “real question is whether in documenting our sources the field will ever be able to keep one step ahead of researchers, providing them with ready-made answers when they are asking new questions.” Hans Brandhorst, “Aby Warburg’s Wildest Dreams Come True?,” *Visual Resources* 29, nos. 1–2 (2013): 76.

9 Georg Schelbert, “Digital Art History – Digitale Kunstgeschichte, Überlegungen zum Aktuellen Stand,” in *Computing Art Reader: Einführung in die Digitale Kunstgeschichte*, ed. Piotr Kuroczyński, Peter Bell, and Lisa Dieckmann, *Computing in Art and Architecture*, vol. 1 (Heidelberg: arthistoricum.net, 2018), 54. In her latest publication, Drucker fully acknowledges the importance of interpretation for the humanities. See Johanna Drucker, *Visualization and Interpretation: Humanistic Approaches to Display* (Cambridge, MA: The MIT Press, 2020).

It remains to be seen if computational analysis will ever gain the same importance in art history as in disciplines within the humanities that are primarily text-based.¹⁰ In art history, material artifacts without inherent digital representation are traditionally the starting point of study. As Schelbert pointed out, the interpretation of art and its historical context is an intellectual and theoretical process. But the ways in which information is structured and links between data are made influence the interpretation of that data.¹¹ The latest digital art history special edition of *Visual Resources* (2019) similarly highlights that “creating a database is anything but straightforward and that its complications cannot be separated from disciplinary, socio-historical, and ideological contexts.”¹²

The reassessment of the current state of research in the field of digital art history mainly reveals that “data sets are not ‘interpretations’ or ‘conclusions’ in and of themselves; all hypotheses and interpretations must be made by examining data in conjunction with historical knowledge and taking into consideration the contexts in which the works and artists exist.”¹³ However, the focus on databases within digital art history seems to come at a cost.

In 2012 Schelbert identified “image analysis and image annotation” (*Bildanalyse und Bild-Annotation*) as one of the six areas of work in digital art history. This aspect had disappeared from his list of 2018.¹⁴ A similar trend can be discerned in the contributions to *The Routledge Companion to Digital Humanities and Art History* of 2020.¹⁵ None of the thirty-four chapters deals explicitly with the analysis and annotation of images. Whenever images are referenced in this book, the focus is limited to the formal analysis of artworks rather than offering interpretations of what is depicted and its associated meanings. Traditionally the latter has been at the heart of art historical research.

10 Schelbert, “Digital Art History,” 48; and Lev Manovich, “Data Science and Digital Art History,” *International Journal for Digital Art History* 1 (2015): 13–35.

11 Schelbert, “Digital Art History,” 54–5.

12 Murtha Baca, Anne Helmreich, and Melissa Gill, “Digital Art History,” *Visual Resources* 35, nos. 1–2 (2019): 2.

13 Baca, Helmreich, and Gill, “Digital Art History,” 3.

14 Schelbert, “Digital Art History,” 45. The 2018 list consists of: innovative search strategies and tools; cross-media semantic linking and enrichment of information units; social media; reception research; digital visualizations and diagrams; and digital communication of art historical knowledge.

15 Kathryn Brown, ed., *The Routledge Companion to Digital Humanities and Art History*, Routledge Art History and Visual Studies Companions (New York: Routledge, 2020).

3 Looking, seeing, understanding

The discipline of art history revolves around objects (e.g. paintings) and images (e.g. that which is represented in paint). Stories on the origins of art in general, and painting in particular, can already be found in Pliny the Elder's *Naturalis Historia* (77–79 AD), for example.¹⁶ They all have in common that the outlines of a person's shadow are traced. By the seventeenth century the art of painting had definitely become more sophisticated and a wide variety of materials was being used to create and support the image. The study of *constcamer* paintings within this project is primarily concerned with the analysis and interpretation of the image, regardless of its materiality.¹⁷

For example, it is certainly impressive to experience the grandeur of Rembrandt's *The Night Watch* (1642) physically and aesthetically in the Rijksmuseum.¹⁸ But in order to examine and understand the iconographic meaning embedded in the image – a meaning which is both sociohistorically and culturally determined – the artwork can equally be studied from a screen, print, or any other form of reproduction.¹⁹

To study *constcamer* paintings, this project does not focus on applying one single method or theory. In line with the recommendations of Lorenz, I am using a “multilateral, multi-method approach” combining formalized methods such as iconology, semiotics, and image studies in order to study and interpret these images.²⁰ This means that, first of all, the pictorial properties of the artworks are looked at. The content of the images informs analysis and dictates the subsequent research necessary for interpretation. This is a process of looking, seeing or cognitively identifying what it is we are looking at, and determin-

16 Pliny, *The Natural History of Pliny*, trans. John Bostock and Henry T. Riley (London: H. G. Bohn, 1855), 35.5.

17 The branch of art history that deals with the materiality of artworks is called technical art history.

18 See Christopher Morse's contribution to this volume, Chapter 13.

19 See for example the highly detailed photograph of *The Night Watch* available via Rijksmuseum, “Operation Night Watch”, accessed October 15, 2020, <https://www.rijksmuseum.nl/en/nightwatch>.

20 Katharina Lorenz, *Ancient Mythological Images and Their Interpretation: An Introduction to Iconology, Semiotics and Image Studies in Classical Art History* (Cambridge: Cambridge University Press, 2016), 245. This book is an excellent resource for those who are not yet familiar with the study of images and their interpretation.

ing meaning.²¹ In addition I document part of this process textually by means of annotations.

Annotating or adding information about what is represented in *constcamer* paintings poses a great challenge, mainly because there are no complementary sources that go with these pictures. Consequently, it can be very difficult to establish what you “see” when you do not know exactly what you are looking at. This difference between looking and seeing has already been discussed by Fleck (1896–1961) in his 1947 paper on the philosophy of science entitled “To Look, to See, to Know.”²² “Fleck distinguishes between ‘looking’ and ‘seeing’ – the former referring to the physiological process of visual perception, the latter to the cognitive aspect of identifying what someone is looking at.”²³ Contextual knowledge, as Fleck argued, is often necessary in order to be able to see – “To see, one has first to know.”²⁴

Fleck’s view is not that different from the theories of knowledge that prevailed in previous centuries, which can be traced all the way back to classical antiquity. Interestingly, he illustrates the problem of seeing shapes or forms with the example of letters of the alphabet.²⁵ The understanding of the visual experience was also given much thought in the Renaissance. Written text is something to be seen, just like a picture, and both text and image were conceived as part of visual culture. Moreover, according to Leonardo da Vinci (1452–1519), paintings give “unmediated access to nature that words cannot give,” and painting thus constitutes a kind of universal language that can replace the written word.²⁶ The

21 This roughly corresponds to the three steps of iconology (i.e. phenomenal meaning, meaning dependent on content, and documentary meaning), or semiotic triangulation (of object, sign, and connotation). See Erwin Panofsky, “On the Problem of Describing and Interpreting Works of the Visual Arts,” trans. Jaś Elsner and Katharina Lorenz, *Critical Inquiry* 38, no. 3 (2012): 482; and Lorenz, *Ancient Mythological Images*, 105.

22 Ludwik Fleck, “To Look, to See, to Know [1947],” in *Cognition and Fact: Materials on Ludwik Fleck*, ed. Robert S. Cohen and Thomas Schnelle, Boston Studies in the Philosophy of Science, vol. 87 (Dordrecht: D. Reidel Publishing Company, 1986), 129–51.

23 Tim Boon et al., “A Symposium on Histories of Use and Tacit Skills,” *Science Museum Group Journal* 8, no. 8 (2020).

24 Fleck, “To Look,” 134.

25 Fleck, “To Look,” 131.

26 Pamela H. Smith, *The Body of the Artisan: Art and Experience in the Scientific Revolution* (Chicago: University of Chicago Press, 2004), 92; and David Summers, *The Judgment of Sense: Renaissance Naturalism and the Rise of Aesthetics*, Ideas in Context (Cambridge: Cambridge University Press, 1987), 137–9.

concern with “how to adjust words to things, or *verba* to *res*” remained prominent well into the seventeenth century.²⁷

One of the reasons for the fascination with words and things (including images) at that time was the exploration of the New World and the discoveries this led to. Since there were no antique sources describing the novelties that were being found, there were no textual authorities to verify such findings.²⁸ Another reason was the “rise of the vernaculars” in an age of “inventorying and categorizing” the visible world, which often meant that words did not yet exist and had to be invented.²⁹ The complexity of the pictorial sign, however, is that the meaning it signifies is not fixed and depends on historical and sociocultural factors.³⁰

As a result, the meaning of the *constcamer* with its many representations has been largely lost, while the image has survived. This demonstrates that the transfer of images as a universal language without contextual information does not stand the test of time. In concrete terms this means that only part of the iconographic significance of the *constcamer* can be deduced from its images. The remainder requires the study of various contemporary sources in order to penetrate into the intellectual mindset of the period in which they were made. The findings based on looking and seeing can be documented in a dataset, but not the processes of determining meaning.³¹ Interpretation is inextricably linked to additional art historical research.

4 Classification and identification

The Order of Things by Michel Foucault (1926–1984) has been studied extensively in relation to museums and collections, but less so in connection with *constcamer* paintings or pictures of collections.³² Foucault’s form of historical

27 Thijs Weststeijn, “From Hieroglyphs to Universal Characters: Pictography in the Early Modern Netherlands,” in *Netherlands Yearbook for History of Art – Nederlands Kunsthistorisch Jaarboek* 61, ed. Eric Jorink and Bartholomeus A. M. Ramakers (Zwolle: WBooks, 2011), 239.

28 Smith, *The Body of the Artisan*, 42.

29 Weststeijn, “From Hieroglyphs,” 269.

30 Robert S. Cohen and Thomas Schnelle, eds., *Cognition and Fact: Materials on Ludwik Fleck*, Boston Studies in the Philosophy of Science, vol. 87 (Dordrecht: D. Reidel Publishing Company, 1986), xi–xii.

31 This corresponds to what in iconology is called documentary meaning, or connotation in semiotics (see above).

32 Most notably in Eileen Hooper-Greenhill, *Museums and the Shaping of Knowledge* (London: Routledge, 1992).

awareness is useful when dealing with such images. On systems of classification, he famously quotes

a “certain Chinese encyclopedia” in which it is written that “animals are divided into: (a) belonging to the Emperor, (b) embalmed, (c) tame, (d) suckling pigs, (e) sirens, (f) fabulous, (g) stray dogs, (h) included in the present classification, (i) frenzied, (j) innumerable, (k) drawn with a very fine camel-hair brush, (l) *et cetera*, (m) having just broken the water pitcher, (n) that from a long way off look like flies.” In the wonderment of this taxonomy, the thing that we apprehend in one great leap, the thing that, by means of this fable, is demonstrated as the charm of another system of thought, is the limitation of our own, the stark impossibility of thinking *that*.³³

By replacing the example of a “Chinese encyclopedia” with a “*constcamer* painting,” we realize that here too we are dealing with another system of thought.

For example, fossilized shark teeth (see orange frame in Fig. 1) were found on beaches and thought, in the seventeenth century, to be fish tongues or “tongue stones.” They were categorized and depicted between other “stony” objects such as seashells and coral that were the subject of contemporary debates on petrification.³⁴ Another example is the display of musical instruments together with clocks – the latter being considered today purely as mechanical devices for timekeeping, but which were then treated like trumpets and violas, associated with the greater theory of universal harmony.³⁵ The writing of history, however, does require the “translation of past concepts and terms into ones that can be comprehended by modern-day audiences.”³⁶ The same applies to the transformation of *constcamers* and other images into data.

33 Michel Foucault, *The Order of Things; An Archaeology of the Human Sciences* (New York, 1971), xv; and Hooper-Greenhill, *Museums*, 4.

34 Marlise Rijks, “Catalysts of Knowledge: Artists’ and Artisans’ Collections in Early Modern Antwerp” (Ghent: Ghent University, 2016), 179 and 222–30. According to Rijks, it seemed impossible to classify coral at the time, because it was not known how it came into existence. Several classification suggestions were circulated (such as plant, stone, or animal), but no consensus was reached. See Marlise Rijks, “‘Unusual Excrescences of Nature’: Collected Coral and the Study of Petrified Luxury in Early Modern Antwerp,” *Dutch Crossing* 43, no. 2 (2019): 140.

35 See for example the *Allegory of Hearing*, part of *The Five Senses* mentioned in the introduction.

36 Adam Mosley, “‘Sundials and Other Cosmographical Instruments’: Historical Categories and Historians’ Categories in the Study of Mathematical Instruments and Disciplines,” in *The Whipple Museum of the History of Science*, ed. Joshua Nall, Liba Taub, and Frances Willmoth (Cambridge: Cambridge University Press, 2019), 80.



Fig. 1: Frans Francken II, *Cabinet of Art and Curiosities*, ca. 1620–1625. Oil on panel, 74 x 78 cm. Vienna, Kunsthistorisches Museum of Vienna, Gemäldegalerie, Inv. no. 1048.
 © Wikimedia Commons, accessed September 28, 2020, [https://commons.wikimedia.org/wiki/File:Frans_Francken_\(II\),_Kunst-_und_Rarit%C3%A4tenkammer_\(1636\).jpg](https://commons.wikimedia.org/wiki/File:Frans_Francken_(II),_Kunst-_und_Rarit%C3%A4tenkammer_(1636).jpg); painting
 © Kunsthistorisches Museum Vienna, CC BY-NC-SA 4.0, www.khm.at/de/object/912d2b1c7b.
 The shark tooth has been highlighted with the orange box by the author.

5 Paintings as data

The question of how art historical objects and images can be converted into concepts and terms that can be understood by today's audience and, moreover, can be processed digitally, is one that was already being asked over fifty years ago.

One way to bring an ideal system down to reality is to ask ourselves three questions. Once the program for the system is outlined, who will make it, who will use it, and who

will maintain it? [. . .] The second question, “Who will use the archive?,” is prompted by a slogan found on the walls of many computer centers. It reads, “Your formula for failure is to try to please everybody.”³⁷

Taking this advice to heart, I opted to cater mainly to my own needs. My dataset is set up so that it can easily be shared and used by others but, when making technical choices regarding the structure and format, for example, this was never a primary concern. And other potential users of this dataset will have their own equally specific needs, so it is not up to me to dictate their process. However, there are examples and best practices we can learn from.

As we have seen, present-day digital art history projects often focus on the contextual information that surrounds works of art, for example when conducting art market studies and provenance research.³⁸ This is understandable from a data point of view, since context usually deals with text and numbers rather than images.³⁹ Projects that, on the other hand, include the iconographic meaning of artworks to a greater or lesser degree are often related to museums. On-line museum catalogs such as those of the Rijksmuseum and the Walters Art Museum sometimes indicate what is depicted in the online images of works from their collections.⁴⁰ In this way, users are given additional ways to search and explore the data, but this is nowhere near the level of detail required for art historical research.⁴¹

37 Kenneth Lindsay, “Computer Input Form for Art Works: Problems and Possibilities,” in *Computers and Their Potential Applications in Museums: A Conference Sponsored by the Metropolitan Museum of Art, 1968* (New York: Arno Press, 1968), 21–2. For more recent approaches, see especially Ross Parry, ed., “(Part One) Information: data, structure and meaning,” in *Museums in a Digital Age*, Leicester Readers in Museum Studies (London: Routledge, 2010), 10–115.

38 Examples of such projects are the *London Gallery Project* and *Mapping Titian*, respectively, accessed September 28, 2020, <http://learn.bowdoin.edu/fletcher/london-gallery/>; and <http://www.mappingtitian.org/>.

39 Furthermore, “the lack of trained individuals to describe visual content is a continuing impediment to providing access to photographic and other visual collections,” as noted in Joan E. Beaudoin, “Describing Images: A Case Study of Visual Literacy among Library and Information Science Students,” *College & Research Libraries* 77, no. 3 (2016): 389.

40 Getty Foundation, *Museum Catalogues in the Digital Age: A Final Report on the Getty Foundation’s Online Scholarly Catalogue Initiative (OSCI)* (Los Angeles: Getty Foundation, 2017); and Claire Quimby, *Digital Catalogues Study: A Cross-Institutional User Study of Online Museum Collection Catalogues* (Chicago: Art Institute of Chicago, 2019), <https://digpublishing.github.io/catalogues-study/>. See for example <http://hdl.handle.net/10934/RM0001.collect.96871>; and <https://art.thewalters.org/detail/14623/the-archdukes-albert-and-isabella-visiting-a-collectors-cabinet/>, all accessed October 16, 2020.

41 This statement is based on my extensive research in 2017 into the usability of datasets, such as those of the Rijksmuseum and Metropolitan Museum of Art, for answering art historical

One of the online projects that bring together and present art historical data from numerous museum and other collections is the website janbrueghel.net. This website offers a complete catalog of the works of Jan Brueghel I and includes two companion sites dedicated to Pieter Bruegel I (Jan I's father) and the Brueghel family.⁴² Together they are "meant to provide ways of furthering our understanding of how the Brueg(h)el family produced a complex body of interconnected work."⁴³ The catalog entries are sometimes accompanied by a discussion section that offers valuable insights into past and present scholarly debates. While tags are a means of roughly indicating what the artworks represent, image annotation is not the main concern of this particular website.

The Wikimedia Commons website, on the other hand, has implemented a different solution to annotating and referring to other Wikimedia image entries. Its online image of the *constcamer* painting *Cabinet of Art and Curiosities* (ca. 1620–1625) (Fig. 1), for example, is supplemented with several annotations that become visible when moving the mouse pointer over the image.⁴⁴ These mouseovers show either a text or an image, notably of the paintings represented in the *constcamer*, and clicking on one of these takes the user to the Wikimedia entry for that specific artwork.⁴⁵

Wikimedia's annotations are an elegant solution, but the inclusion of text that can be entered freely results in descriptions such as "? *Mitra cardinalis*" and "probably some *Amphidromus*" regarding the seashells on display in Fig. 1. From a computational point of view it would be desirable to structure such data by using controlled vocabularies, so that all depictions annotated with *Mitra cardinalis* are understood as the same type of seashell. When in doubt about what kind of seashell is represented, it would be more reasonable to simply annotate "seashell" instead of including a question mark in the annotation.

questions. Some of the results can be found on "Visualizing Visions", accessed October 18, 2020, <http://visualizingvisions.com/>.

⁴² Elizabeth Honig, "Jan Brueghel," University of Maryland, Baltimore, accessed September 28, 2020, <http://www.janbrueghel.net/>.

⁴³ Elizabeth Honig, "Pieter Bruegel" and "Brueghel Family," University of Maryland, Baltimore, <http://pieterbruegel.net/>; and <http://brueghelfamily.net/>, both accessed September 28, 2020.

⁴⁴ Wikimedia Commons, "Chamber of Art and Curiosities," accessed September 28, 2020, [https://commons.wikimedia.org/wiki/File:Frans_Francken_\(II\),_Kunst-_und_Raritätenkammer_\(1636\).jpg](https://commons.wikimedia.org/wiki/File:Frans_Francken_(II),_Kunst-_und_Raritätenkammer_(1636).jpg).

⁴⁵ One of the small portraits on the left, for example, links to Peter Paul Rubens' *Abraham Ortelius*, available at https://commons.wikimedia.org/wiki/File:Abraham_Ortelius_by_Peter_Paul_Rubens.jpg, accessed January 7, 2021.

The Getty Vocabularies are usually at the basis of digital art history projects dealing with datasets.⁴⁶ These controlled vocabularies are reference works that contain structured terminology for categorizing works of art and architecture (in the Art & Architecture Thesaurus, or AAT), their creators and current owners (in the Union List of Artist Names, or ULAN), and associated geographic names (in the Getty Thesaurus of Geographic Names, or TGN). These vocabularies have been in development since the late 1960s for museum cataloging and information retrieval.⁴⁷ It is important to keep in mind, however, that historical terms and concepts are not necessarily part of the vocabularies. For example, “fish tongues” or



Fig. 2: Jan Brueghel II, *Allegory of Sight (Venus and Cupid in a Picture Gallery)*, ca. 1660. Oil on copper, 58.1 x 89.7 cm. Philadelphia, Philadelphia Museum of Art, Inv. no. 656. © Wikimedia Commons, accessed September 28, 2020, https://commons.wikimedia.org/wiki/File:Jan_Breughel_II_-_Allegory_of_Sight_-_gallery_painting_Cat656.jpg; painting © Philadelphia Museum of Art, accessed September 28, 2020, <https://www.philamuseum.org/collection/object/102459>. The sector has been highlighted with the rectangular box by the author.

⁴⁶ Diane M. Zorich, *Transitioning to a Digital World: Art History, Its Research Centers, and Digital Scholarship* (The Samuel H. Kress Foundation & The Roy Rosenzweig Center for History and New Media, George Mason University, 2012); and Patricia Harpring, *Introduction to Controlled Vocabularies: Terminology for Art, Architecture, and Other Cultural Works*, 1st ed. (Los Angeles, CA: Getty Research Institute, 2010).

⁴⁷ Brown, *The Routledge Companion*, 440.

“tongue stones” are not included in the Getty’s AAT, but “shark teeth” are, yet without reference to earlier interpretations.⁴⁸

6 *Constcamer* paintings as data

Annotating paintings can be a complex task and involves collecting metadata, then breaking down the content of the images into thematic and iconographic elements. Conceptually, my dataset consists of “entities” and “links”: an entity can be connected to another entity through such a link. For example, the *constcamer* painting entitled *Allegory of Sight (Venus and Cupid in a Picture Gallery)* (Fig. 2) is an entity. Another entity is the painting’s artist, the person Jan Brueghel II (Jan I’s son). These two entities are connected to each other by means of the link type “creator.” In this way it is documented that the *Allegory of Sight* was created by Jan Brueghel II, the Flemish painter and draftsman who lived from 1601 to 1678.⁴⁹ It is useful to refer to Jan Brueghel II’s record in the Getty’s ULAN because his name can be written in many ways but, with the ULAN, we know exactly which artist is meant.⁵⁰

The same method is used to annotate what is depicted in a *constcamer* painting, only this time with the link type “depicts.” The entity *Allegory of Sight* depicts among other things the entity “sector.” This term can mean different things, and therefore reference is made to a specific Getty AAT record that describes sectors, in this context, as “proportional measuring gauges consisting of two straight, metal bars hinged at one end and graduated for measuring; used in clockmaking” (see Fig. 2).⁵¹ By the end of the sixteenth century, the period of its invention, the main use of the sector was to solve mathematical problems, and the design of the instrument was continuously improved upon – but this aspect is not captured by the Getty Vocabularies.

⁴⁸ Getty Research Institute, “Shark Teeth” (AAT), accessed October 16, 2020, <http://vocab.getty.edu/page/aat/300379302>.

⁴⁹ Getty Research Institute, “Brueghel, Jan, the younger” (ULAN) accessed September 28, 2020, <http://vocab.getty.edu/page/ulan/500013747>.

⁵⁰ Whenever an artist is missing from the Getty’s ULAN, the Netherlands Institute for Art History’s online resource “RKD Explore” is used as the authority instead. See for example, The Netherlands Institute for Art History (RKD), “Jan Breughel (II),” accessed September 28, 2020, <https://rkd.nl/explore/artists/13289>.

⁵¹ Getty Research Institute, “Sectors” (AAT), accessed September 28, 2020, <http://vocab.getty.edu/page/aat/300201680>.

Additionally, the list of terms in other languages provided by Getty's AAT is far from comprehensive. The sector is referred to in French as the *compas de proportion*, in German as the *Proportionalzirkel*, in Dutch as the *proportionalpasser*, and in Italian as the *compasso di proporzione*. The proportional compass, however, is known in French as the *compas de réduction*, in German as the *Reduktionszirkel*, in Dutch as the *reductiepasser*, and in Italian as the *compasso di riduzione*.⁵² To complicate matters even further, each inventor who developed a variation on the sector, around the year 1600 that is, also gave their invention a new name. Thomas Hood (ca. 1556–1620) was the first to call his instrument a sector, inspired by Euclid's *Elements*, while Michiel Coignet (1549–1623) speaks of his *pantomètre*, and Muzio Oddi (1569–1639) of his *compasso polimetro*.⁵³

Nevertheless, the entity “sector” provides a basis for mapping and comparing all instances of representations of this type in *constcamer* paintings. Such annotations are the result of looking and seeing understood as the cognitive identification of what we are looking at. In order to determine meaning we need to broaden our view and take into account not only the realistic, but also the allegorical qualities of a *constcamer* painting such as the *Allegory of Sight*. Its overall theme is the sense of sight, the most important of the five classical senses (i.e. sight, hearing, taste, touch, and smell).⁵⁴ The inclusion of a mathematical instrument such as the sector in this painting suggests a symbolic significance of the instrument as an aid to vision or a tool to improve sight.

7 The *constcamer* dataset: Possibilities and limitations

The sector is just one small representation – of about 3.8 by 3.6 centimeters – amid many others in the *Allegory of Sight*. Each of the represented objects,

52 Ad Meskens, “Michiel Coignet’s Contribution to the Development of the Sector,” *Annals of Science* 54 (1997): 143. See also, Getty Research Institute, “Proportional Compasses” (AAT), accessed September 28, 2020, <http://vocab.getty.edu/page/aat/300022492>; and <https://catalogo.museogalileo.it/approfondimento/Compasso.html>.

53 Robert Bud and Deborah Jean Warner, eds., *Instruments of Science: An Historical Encyclopedia*, Garland Encyclopedias in the History of Science, vol. 2 (New York: Garland Publishing, 1998), 527; and Filippo Camerota, *The Geometric and Military Compass of Galileo Galilei*, ed. Filippo Camerota and Giorgio Strano, *Scientific Instruments: History, Exploration, Use 1* (Florence: Scatolificio Isolotto, 2004), 62.

54 Charles M. Peterson, “The Five Senses in Willem II van Haecht’s *Cabinet of Cornelis van der Geest*,” *Intellectual History Review* 20, no. 1 (2010): 105–9.

animals, plants, people, and interior and exterior elements have stories of their own. This abundance of data can be effectively collected and archived in a relational database management system. My project makes use of a no-code development platform (NCDP), which is database management software with a graphical user interface.⁵⁵ Currently, my dataset holds 161 *constcamer* paintings in the form of images and associated information. These give rise to approximately 3,400 entities that are connected to each other via 13 link types. In total I have recorded about 12,700 such connections between these entities.

The *constcamer* dataset describes the contents of pictures of collections. These paintings provide insight into contemporary thoughts on the organization of items included in collections and the associated meanings they represented.⁵⁶ Having to be precise when naming the individual entities depicted in *constcamer* paintings actually leads to improved vision. A shark tooth or sector can easily be overlooked, but this is less likely when applying a label to each representation in a painting. In this way annotation promotes accuracy, which generates a more extensive overview of what is displayed in the seventeenth-century pictures of collections. Moreover, by looking at *constcamer* paintings collectively, repetitions of subject matter and certain entities can readily be observed.

At the same time, there are the issues of transformation and translation. As we have seen, the dataset requires a transformation of *constcamer* paintings into data. These data are a modern interpretation of the pictorial content and require additional translation to expose historical and ideological meanings. The *constcamer* dataset is therefore not an interpretation or conclusion in itself, but rather a starting point for further analysis.

8 Conclusion

Constcamer paintings are rich and varied images whose content can be “re-viewed” via a dataset. While the dataset is an integral part of digital art history, the analysis and annotation of images is currently an underrepresented area of work in this field. One of the main reasons for this is that a transformation is needed to turn artworks into representative digital equivalents. A

⁵⁵ For a brief overview of NCDPs, see, <https://www.g2.com/categories/no-codedevelopment-platforms>, accessed September 28, 2020.

⁵⁶ See especially “Vorrede – Das Objekt als Symbol” in Andreas Grote, ed., *Macrocosmos in Microcosmo: Die Welt in der Stube: Zur Geschichte des Sammelns, 1450 bis 1800*, Berliner Schriften zur Museumskunde, vol. 10 (Opladen: Leske + Budrich, 1994), 11–9.

further difficulty is that images from bygone eras reflect systems of thought that are different from our own. The ensuing process of translation results in a mediated access to the content of the images, the meaning of which can only be determined on the basis of knowledge of the contexts in which artworks and their creators existed.

The annotation of *constcamer* paintings by means of controlled vocabularies enables the retrieval of information by expert and non-expert users alike. This information is collected by looking, and by identifying what we see. A dataset makes it possible to archive a large number of identifications and the relations between these identifications, as well as to share them with the scholarly community and an interested audience. The *constcamer* dataset is thus a tool that allows for better vision. The act of interpretation, or understanding what a certain representation means, is not recorded digitally because – as is wisely inscribed on a piece of paper depicted in *The Interior of a Picture Gallery with Personifications of Pictura and Disegno* (ca. 1630) of which the Flemish painter is not known – “*aly et alia vident*” or, “others see it yet otherwise.”⁵⁷

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57 Michael John Gorman and Alexander Marr, “‘Others See It Yet Otherwise’: Disegno and Pictura in a Flemish Gallery Interior,” *The Burlington Magazine* 149 (2007): 88.

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