

## RESEARCH ARTICLE

# Producing Knowledge in Early Modern Rome: Concepts and Practices of *Disegno* in the Accademia di San Luca and the Accademia dei Lincei

Matthijs Jonker

Royal Netherlands Institute in Rome (KNIR), IT  
[m.jonker@knir.it](mailto:m.jonker@knir.it)

This article offers new insights into the relationship between science and art in the early modern period by focusing on the concepts and practices of *disegno* (meaning a physical drawing or a mental design) in two Roman academies around 1600: the Accademia di San Luca and the Accademia dei Lincei. The first president of the Accademia di San Luca, Federico Zuccari, developed an elaborate theory of art that centered on the concept of *disegno*. More than other contemporary art theorists, Zuccari explicitly connected the process of artistic production to that of knowledge acquisition, and he described his theory of *disegno* as belonging to natural philosophy. The first part of the article provides a more profound interpretation of the relationship between the theoretical and the practical parts of Zuccari's theory than has hitherto been given. His views of the relationship between knowledge acquisition and artistic production play a central role in this interpretation. The second part shows how his theory of *disegno* informed his ideas for the step-by-step training program of the Accademia di San Luca. In the third part, Zuccari's theory of art is used to analyze the functions of the *disegni* (drawings, woodcuts, and engravings) and the artists the Accademia dei Lincei employed for its scientific projects in the first half of the seventeenth century. Seen through the lens of Zuccari's theory, it is possible to understand the images as well as the artists themselves as instruments in the Lincean investigation of nature and to explain the different categories—academic or non-academic—used to distinguish among the different levels of proficiency that artists could attain.

**Keywords:** *Disegno*; Federico Zuccari; Accademia di San Luca; Accademia dei Lincei; natural philosophy; epistemic images

Our understanding of the intimate relationship between the sciences and the visual arts in the early modern period has greatly improved over the past three decades. An ever growing number of publications by scholars working on the boundary between the history of science and art history have elucidated the various epistemic functions of images in processes of knowledge production and dissemination.<sup>1</sup> Sachiko Kusukawa and Lorraine Daston have shown, for instance, that early modern botanists, zoologists, and physicians used drawings and prints as visual narratives to prove an argument or the existence of a species, as substitutes for the objects described, or as mnemonic aids.<sup>2</sup>

However, what have not hitherto received sufficient attention in this burgeoning interdisciplinary field are the roles of art theory, art education, and the division of labor within the science-art relationship in the early modern period.<sup>3</sup> This article addresses these points by offering an in-depth analysis of the concept

<sup>1</sup> For a substantial but not exhaustive analytical overview of the literature, see Marr, "Knowing Images."

<sup>2</sup> Kusukawa, "Uses of Pictures"; Dackerman, "Introduction"; Daston, "Epistemic Images."

<sup>3</sup> For an analysis that includes early modern (Spanish) art theory, see Marcaída López, *Arte e Ciencia*, 180–92.

and practice of *disegno* (meaning a physical drawing or a mental design) in two Roman academies around 1600. The first is the Accademia di San Luca. Sanctioned by the pope and founded in 1593, it was the second official art academy after the Florentine Accademia del Disegno established thirty years earlier under the protection of Duke Cosimo I de' Medici. The Roman institution consisted of two branches: the Accademia proper and the Compagnia. Whereas the Accademia governed the institution as a whole and organized the pedagogy, the Compagnia was responsible for the institution's confraternal activities. The academy offered young painters, sculptors, and architects instruction in the theoretical principles of their professions as well as practical training in drawing.<sup>4</sup>

The second academy to be discussed is the Accademia dei Lincei, which was founded in 1603 by the young Roman aristocrat Federico Cesi (1585–1630) and three of his friends. Although cultivating interests in the traditional and occult sciences, such as astrology, the Accademia dei Lincei is often credited for being the first modern scientific institution. The reasons for this are that in their scientific projects the Linceans emphasized observation and experimentation; were among the first to use the telescope and microscope systematically; conceived of science as a collective enterprise; focused on the so-called “lesser known sciences,” such as mathematics, natural history, and natural philosophy; and were supporters of Galileo Galilei (1564–1642), who was elected a member in 1611.<sup>5</sup>

These two Roman academies were connected by the concept and practice of *disegno*. Originally denoting a drawing or sketch on paper, over the course of the sixteenth century, the term acquired a second, more intellectual and cognitive meaning of an image in the artist's mind on the basis of which he produced a work. That *disegno* was conceived of as a cognitive activity around the turn of the seventeenth century has been firmly established in relation to Galilean astronomy. Samuel Edgerton and Horst Bredekamp have convincingly argued that it was Galileo's training in perspectival drawing under the Medici court mathematician Ostilio Ricci (1540–1603) that enabled him to correctly interpret the dark blotches as mountains and craters when observing the moon with his telescope in 1609.<sup>6</sup>

As is well known, Galileo's discovery had far-reaching implications for astronomical theory because it refuted the accepted view as expressed in the Ptolemaic-Aristotelian tradition that all heavenly bodies are perfect and spotless globes. In the context of the ensuing debate, the painter Lodovico Cardi da Cigoli (1559–1613) ridiculed one of Galileo's detractors by stating that he was a “man without eyes” because he lacked a mastery of *disegno*.<sup>7</sup> This episode shows that Cigoli and Galileo conceived of *disegno* as an activity in which drawing, seeing, and understanding reinforced each other.

Both Cigoli and Galileo had learned the principles of *disegno* in the 1580s from the engineer and artist Bernardo Buontalenti (1532–1608), who was a prominent member of the Accademia del Disegno.<sup>8</sup> However, it was in the 1590s at the Roman Accademia di San Luca that the most elaborate theoretical and practical instruction program centering on *disegno* was developed. This is evident in *Origine, et progresso dell'Accademia del Disegno de Pittori, Scultori, et Architetti di Roma (Origine)*, published in 1604 by its secretary Romano Alberti.<sup>9</sup> The protagonist and hero of *Origine* is Federico Zuccari (1540–1609), who was the president of the academy during the first year of its existence (1593–1594). Alberti described how Zuccari not only established the institution's curriculum but also presented the core of his theory of art that he would publish in much elaborated form in *L'Idea de' pittori, scultori et architetti (Idea)* in 1607.<sup>10</sup>

The double meaning of *disegno* as material and intellectual or practical and theoretical played a central role in Zuccari's theory *and* in his curriculum. Moreover, more than other contemporary art theorists, Zuccari explicitly connected the process of artistic production to that of knowledge acquisition, and he described his theory of *disegno* as belonging to natural philosophy.<sup>11</sup> This is one of the reasons for connecting his theory of *disegno* to the knowledge practices of the Accademia dei Lincei, which, as mentioned, focused for an important part on natural philosophy and natural history.

A second reason is that members of both academies were part of overlapping networks of artists, natural philosophers, and collectors with shared interests in the study of nature. For instance, the circle surrounding

<sup>4</sup> The most recent and comprehensive study on the Florentine academy is Barzman, *Florentine Academy*; that on the Roman academy is Lukehart, *Accademia Seminars*; and that on both (with an extensive comparison) is Jonker, “Academization of Art.”

<sup>5</sup> The most recent comprehensive publications on the Accademia dei Lincei are Baldriga, *Occhio della Lince*; Freedberg, *Eye of the Lynx*; Battistini et al., *Origine della scienza*; and Galluzzi, *Lynx and the Telescope*.

<sup>6</sup> Edgerton, *Heritage*, 223–53; and Bredekamp, “Gazing Hands,” 153–92.

<sup>7</sup> Cigoli, letter to Galileo, 11 August 1611, in Tognoni, *Carteggio Cigoli-Galileo*, 66.

<sup>8</sup> Jonker, “Academization of Art,” 287.

<sup>9</sup> Alberti, “Origine.”

<sup>10</sup> Zuccari, “Idea.”

<sup>11</sup> Alberti, “Origine,” 29 and 35.

Cardinal Francesco Maria del Monte (1549–1626), who was the official protector of the Accademia di San Luca from 1595–1626, included the Linceans Cesi, Johannes Faber (1574–1629), and Cassiano dal Pozzo (1588–1657) as well as academic artists, such as Antonio Tempesta (1555–1630), Filippo Napoletano (1589–1629), and Francesco Villamena (1566–1625).<sup>12</sup> More concretely, when Cigoli arrived in Rome to work for the pope in 1604, he joined the Accademia di San Luca and gave a lecture on disegno.<sup>13</sup> Eight years later, Cigoli advised the Lincei on how to improve the engravings for Galileo's book on the sunspots.<sup>14</sup> Such overlaps in academic networks make it highly likely that they were aware of Zuccari's theory of disegno.

The third and most important reason for connecting these academies with each other is the fact that the Lincei made extensive use of *disegni* and *disegnatori* (draftsmen) in their scientific projects. Federico Cesi and his colleagues Johannes van Heeck (b. 1579), Francesco Stelluti (1577–1652), and Fabio Colonna (1567–1640) were themselves able amateur draftsmen.<sup>15</sup> Moreover, they commissioned thousands of drawings and prints from professional artists, some of whom were members of or had connections to the Accademia di San Luca. This was the case, for instance, for Tempesta, Villamena, and Giovanna Garzoni (1600–1670).<sup>16</sup> Others, such as Vincenzo Leonardi (1589/90–1646) and Giorgio Nuvolostella, do not seem to have had any relations with the Roman art institution.

The twofold aim of this article is, first, to provide a more profound interpretation of the relationship between the theoretical and the practical parts of both Zuccari's theory and his academic curriculum than has hitherto been given. His views on the relationship between knowledge acquisition and artistic production play a central role in this interpretation. The second aim is to use this interpretation for improving our understanding of the functions of both the images and the artists involved in the Lincei's knowledge practices. Seen through the lens of Zuccari's theory, it is possible to understand both as instruments in the Lincean investigation of nature and to explain why Cesi and his colleagues used different categories—academic or non-academic—of artists for different parts of their graphical production.

### ***Disegno interno and esterno***

Past interpretations of Zuccari's theory of art have focused almost exclusively on *Idea* and sought to determine his place within the history of art theory. This approach has led to the generally accepted view that Zuccari's theory is simultaneously derivative and innovative: although drawing heavily on Aristotelian-Thomistic faculty psychology and epistemology, his linking of these traditional doctrines to the concept of disegno marks an important moment in the history of art theory and in the social history of art.<sup>17</sup>

The focus on *Idea* by previous scholars, however, has obfuscated how Zuccari envisioned the relation between disegno as an intellectual activity and a mental image (*disegno interno*) on the one hand, and as a material drawing or sketch created by an artist (*disegno esterno*) on the other. An analysis of Alberti's *Origine* allows us to more fully appreciate the centrality of this aspect of Zuccari's theory. Furthermore, Alberti's narrative makes it possible to come to a more profound understanding of the theory's practical consequences.

The first meeting of the Accademia di San Luca was held on 14 November 1593. On this occasion, Zuccari presented his proposal for the institution's educational program. It consisted of two parts: an hour of theory in which the academicians would give lectures on and hold debates about their arts and an hour of practice in which students would learn how to draw.<sup>18</sup> In the ensuing months, several artists gave lectures at the academy on topics related to their professions. Zuccari himself gave a lecture that, not surprisingly, was on disegno.

The central question Zuccari posed in his lecture for the Accademia di San Luca—as in his theory generally—was how disegno is formed. Like previous art theorists, such as Vincenzo Danti (1530–1576)

<sup>12</sup> Solinas, "Pittura filosofica," 259; Jonker, "Accademia dei Lincei's network," 29–30.

<sup>13</sup> Unfortunately, the description of the content of Cigoli's lecture by his nephew and biographer, Giovanni Battista Cardi (Cardi, *Vita di Lodovico Cardi*, 33), is very brief. However, Cigoli's characterization of disegno as fundamental to all human activities is identical to Zuccari's general description of disegno in his lectures at the academy a decade earlier.

<sup>14</sup> Gabrieli, *Carteggio linceo*, 283–84, (no. 176).

<sup>15</sup> Gabrieli, *Carteggio linceo*, 67–68n 1 (no. 24); Tognoni, "Nature Described"; Solinas, "Cassiano dal Pozzo," 126; Solinas, "Osservazione," 231–32.

<sup>16</sup> McBurney, "So Many Celestial Animals," 60–65.

<sup>17</sup> The key publications on Zuccari's theory of art are Panofsky, *Idea*; Rossi, "Idea e accademia"; Kemp "Disegno"; Summers, *Judgment of Sense*; and Williams *Art, Theory, and Culture*. Exceptions to the purely theoretical interpretation of Zuccari's notion of disegno can be found in Pfisterer, "Entstehung des Kunstwerks"; Fowler, *Drawing and the Senses*, 90–97. However, neither author links Zuccari's theory of art to the curriculum in the early years of the Accademia di San Luca.

<sup>18</sup> Alberti, "Origine," 16–17.

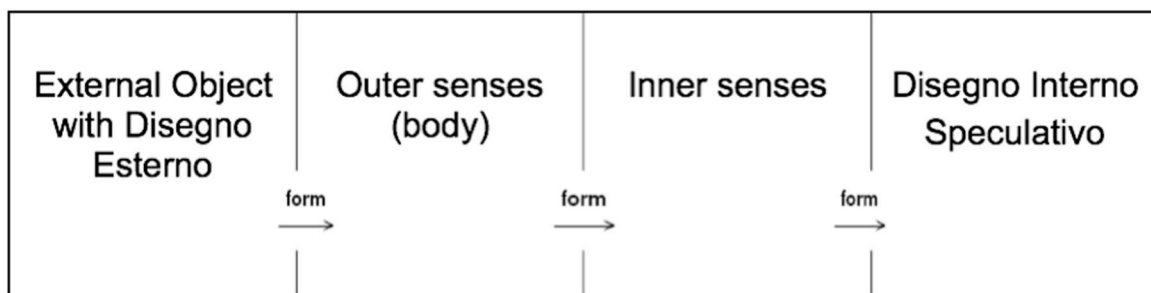
and Giorgio Vasari (1511–1574), Zuccari based his explanation of the formation of *disegno* on Aristotle's *De Anima*. However, his explication was much more elaborate, consistent, and innovative than that of his predecessors.<sup>19</sup> In his lecture, he described how the human mind forms concepts and obtains knowledge about and understanding of objects in the external world and how it, in turn, imparts or causes one to act and produce any kind of object in the world. In this part of the lecture, Zuccari shows his adherence to an empiricist philosophy of knowledge.

Zuccari first noted that there is nothing in the intellect that was not first in the senses, and he even calls the intellect a “blank slate” (*tavola rasa*).<sup>20</sup> He argued that an individual acquires knowledge or forms a concept of something through the help of his or her senses. He called these senses “our instruments or ministers.” They contribute to the process of knowledge acquisition by receiving the “Form” of a thing and, subsequently, by transferring this Form from the external to the internal, or “secret,” senses. In the internal senses, the Form is “illuminated” and given “colors” by the intellect, and a mental image or concept is constructed.<sup>21</sup> This is what Zuccari called the *disegno interno speculativo* (internal speculative design).<sup>22</sup> Here, the term *speculativo* refers to the knowing faculty of the human mind, and its goal is to understand universals (**Figure 1**).<sup>23</sup>

Zuccari distinguished the *disegno interno speculativo* from the *disegno interno pratico* (internal practical design). The latter is also internal because it is the principle and the model in the mind that instigates the actions and the objects a person produces in the external world.<sup>24</sup> Zuccari again described the senses and the body as instruments, and in this case they are used for the production of the *disegni esterni* (external designs). The *disegno esterno* can be broadly defined as any visible shape or figure that expresses the inner Form, or essence, of a thing. Connecting it more specifically to the activity of drawing, Zuccari held that *disegno esterno* is created on paper by circumscribing a figure with a simple line—that is, without rendering the corporeal substance using shadows.<sup>25</sup>

Thus, Zuccari contended that the process of artistic production was the exact reverse and counterpart of the process of knowledge acquisition (**Figure 2**). In the first process, the Form of an external object moves from the *disegno esterno* through the senses to the *disegno interno speculativo* (**Figure 1**); in the second process, it moves from the *disegno interno pratico* through the senses to the *disegno esterno* (**Figure 2**). In other words, the artist's understanding is necessary for rendering an accurate depiction, and the resulting depiction, in turn, augments his understanding.

The relation between the inner and the outer, the mind and the body was central to Zuccari's conception of *disegno*. Whereas *disegno interno speculativo* is both the active principle (*primo motore*) and the resulting mental image of the process of knowledge acquisition, *disegno interno pratico* is simultaneously the active



**Figure 1:** The process of knowledge acquisition according to Federico Zuccari.

<sup>19</sup> Danti, “Primo libro”; Vasari, *Vite*. For a discussion and comparison of these and other contemporary theoretical treatises written by artists, see Jonker, “Academization of Art,” 315–75.

<sup>20</sup> Alberti, “Origine,” 33. Cf. Zuccari, “Idea,” 172–73, 175–76, and 266, where Zuccari gives a similar description of the process and calls the intellect a “wide and clean canvas” (*ampio, e polito quadro*) instead of a *tavola rasa*.

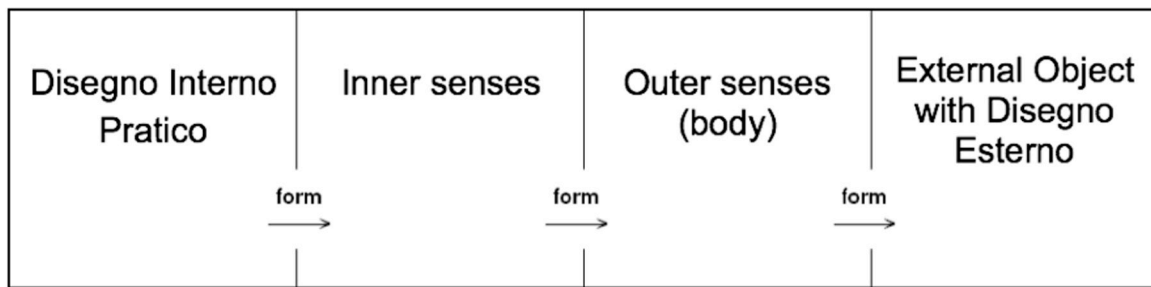
<sup>21</sup> Alberti, “Origine,” 33–34. In fact, the matter is somewhat more complicated. Following Aristotle in *De Anima*, Zuccari distinguished the active from the potential intellect, i.e., the intellect as principle or cause from the intellect as model or mental image. In “Idea,” 171–85, Zuccari discussed the processes of concept formation and artistic production in a more complex and detailed way but essentially in a similar fashion. According to Fowler (*Drawing and the Senses*, 86–90), this Aristotelian scheme regained popularity in the seventeenth century after the publication of Zuccari's *Idea*.

<sup>22</sup> Alberti, “Origine,” 34. See Zuccari, “Idea,” 153–55 for Zuccari's conception of *disegno* as a mental image.

<sup>23</sup> Alberti, “Origine,” 31. Cf. Zuccari, “Idea,” 163.

<sup>24</sup> Alberti, “Origine,” 31. Cf. Zuccari, “Idea,” 167–71.

<sup>25</sup> Alberti, “Origine,” 31.



**Figure 2:** The process of artistic production according to Federico Zuccari.

principle and the mental model in the process of artistic production.<sup>26</sup> For instance—and elaborating on one of Zuccari's examples in *Idea*—after drawing several lions from nature, the universal concept, or *disegno interno speculativo*, of “the lion” is formed in the artist's mind. Subsequently, he can use this concept as the model, or *disegno interno pratico*, for drawing a particular lion—that is, *disegno esterno*—as a preliminary sketch for a work of art. Zuccari acknowledged that artistic products can also be based on mental images that are formed in the fantasy (*fantasia*) of the artist (for example, when he mixes concepts or construes images that have no counterpart in reality) and are thus not based on the direct observation of external reality. In *Idea*, Zuccari used the example of grotesques, painted decorations representing hybrid and mythological figures, for images formed in this way.<sup>27</sup>

As Sergio Rossi and Robert Williams have pointed out, Zuccari's main theoretical achievement and innovation consisted in subsuming the processes of knowledge acquisition and artistic production under the artistic term *disegno*.<sup>28</sup> In doing so, he made Aristotle's theory not only applicable to visual artists, but he also hailed painters, sculptors, and architects as the *professori*—as he called them—who were the best equipped to carry out these processes of knowledge acquisition and artistic production.<sup>29</sup> In contrast to philosophers and theologians on the one hand, and to artisans on the other, Zuccari contended that artists combine and balance the equally necessary intellectual and practical sides of man.<sup>30</sup> What scholars have failed to illuminate until now, however, is how Zuccari's theory of *disegno* was connected to his outline and implementation of the Accademia di San Luca's curriculum during his presidency.

### Zuccari's *disegno* and curriculum for the Accademia di San Luca

Zuccari specified his ideas for the practical training program of the Accademia di San Luca during its second meeting on 28 November 1593.<sup>31</sup> To make the most of the hour of practical training, the president ordered that four groups, or *capate*, be formed to teach the different stages of *disegno*, each associated with different skill levels. In ascending order of proficiency, Zuccari described each of the groups' exercises as follows. In the first group, the student would learn to copy (*copiassero*) the individual body parts, that is, the eyes, noses, mouths, etc. drawn by the academicians who functioned as teachers.<sup>32</sup> In the second group, he would learn to portray or retrace cartoons and reliefs (*ritrare cartoni e rilievi*). Zuccari believed that there already was a respectable collection of such objects in the academy. A document in the archive of the Accademia di San Luca containing the names of artists and the drawings, engravings, and plaster casts they donated for educational purposes confirms this.<sup>33</sup> In the third group, the student would learn to copy the works of the great masters (*copiasse da opere di valent'huomini*). In one of the speeches in which Zuccari presented

<sup>26</sup> Ibid., 34.

<sup>27</sup> Zuccari, “Idea,” 240. See 153–54 for the example of the lion.

<sup>28</sup> Rossi, “Idea e accademia,” 48; Williams, *Art, Theory, and Culture*, 148.

<sup>29</sup> Zuccari, “Idea,” 182 uses the term *professori* (or *comprofessori*) to refer to his fellow artists and, presumably, especially to those who are masters of *disegno* and have their own workshop. Moreover, he refers to painting, sculpture, and architecture as “professions” (*professioni*).

<sup>30</sup> Thereby, Zuccari also implied that artists are the human beings who bear the closest resemblance to God insofar as their *disegno* reflects and resembles the unity of understanding and creation in God. However, he admitted that metaphysicians and theologians contemplate higher and more divine things. See Alberti, “Origine,” 32–34 for Zuccari's comparison of God to the human soul in general and to that of the painter in particular. See Zuccari, “Idea,” 297–99 for his remarks on the status of theologians and metaphysicians.

<sup>31</sup> Alberti, “Origine,” 22–23.

<sup>32</sup> Ibid., 17.

<sup>33</sup> AASL Inventari 1, 1. For a transcription of this document, titled “Cose donate all'Accademia 1594,” see Lukehart, *Accademia Seminars*, 368.

his pedagogical ideas to the members at the academy, he cited Polidoro da Caravaggio as an example of a *valentuomo* whose work was worthy of being copied.<sup>34</sup> Since the institution appears not to have had an elaborate collection of completed masterpieces,<sup>35</sup> the drawing exercises in the third group must have taken place predominantly in churches, squares, and the collections of prelates and aristocrats in Rome rather than in the academy. In the fourth and final *capata*, the student would learn to create his own works and produce realistic compositions from his imagination without using a model.

The levels through which students at the academy must pass to improve their mastery of disegno were set out in a particular order. Successfully completing the first *capata* meant that they were able to mimetically render two-dimensional images on a two-dimensional surface. Upon completing the second and third groups, they were able to render three-dimensional objects and compositions made by other artists in two dimensions. Finally, upon completing the fourth group, they could realistically create their own compositions on paper from his imagination. Once they arrived at this stage, they had completed their artistic training and acquired the skill level of a master artist.<sup>36</sup> At this point, they were ready to execute public commissions based on their own *disegni* or *invenzioni* for the Church or civic government.

Pietro Roccasacca has noted that different terms were used to describe the drawing exercises in Zuccari's *capate*.<sup>37</sup> The beginners in the first group had to *copiare* the examples provided by the professors; students in the second *capate* learned to *ritrarre cartoni e relievi*; those in the third group learned to *copiasse da opere di valent'huomini*; and, in the fourth level, students studied how to *fare disegni, & inventioni*. Thus, the verbs *copiare*, *ritrar[r]e*, and *disegnare* (or *fare un disegno*) denoted the different skills learned at each level.

Relying on the contemporary Italian dictionary, the *Vocabolario della Crusca* (1612), Roccasacca has argued convincingly that these terms marked the cognitive differences among the stages of learning disegno. For example, *copiare* referred to the completely mechanical operation of making a copy of something—that is, of a text, drawing, sculpture, etc. Like *copiare*, the term *ritrarre* signified “making a copy” or “rendering something.” But unlike *copiare*, *ritrarre* also denoted the act of observing and describing nature, which produces an impression of nature in the mind.<sup>38</sup> Finally, *disegnare* was described even more fully as an intellectual activity, the purpose of which was to create a composition, for example, for artistic, scientific, or technical projects.

Roccasacca's interpretation of the terms Zuccari used to refer to the different stages of the curriculum shows that, in the eyes of the first president of the Accademia di San Luca, one had to accumulate quite a lot of intellectual and cognitive skills to become an expert draftsman. Romano Alberti's descriptions of the meetings during the first years of the academy's existence as well as archival documents pertaining to its educational activities during the same period reveal that Zuccari's program was at least partially realized.<sup>39</sup> This means that students participating in the artistic-educational practices of the Accademia di San Luca would have progressed from learning mechanical skills to developing their cognitive abilities.

By connecting Zuccari's educational program to his double-layered notion of disegno, as described in Alberti's *Origine*, it is possible to take a further step and move beyond Roccasacca's interpretation.<sup>40</sup> For Zuccari, the goals of the theoretical education, that is, the lectures and debates, were to train, form, and improve the *disegno interno*—both intellectual and practical—of the artist. These goals, in turn, suggest that the first three stages of disegno—taught in the first three *capate* of the practical education—were designed to be a step-by-step training program in which students learned to extract the Forms of objects in the external world with the help of their drawing pens, which Zuccari described as extensions of their senses, especially, but not exclusively, sight. To reiterate, in the first three *capate*, students learned how to copy individual body parts, reliefs and plaster casts, and works by past masters, respectively. Through this process, students learned how to obtain the *disegni esterni* from the objects in the outer world by repeatedly copying them and turning them into *disegni interni speculativi*, thereby enhancing their understanding of the external

<sup>34</sup> Alberti, “Origine,” 19.

<sup>35</sup> This can be inferred from the academy's inventories from 1624 and 1627. ASR, TNC, uff. 15, 1624, pt. 4, vol. 102, fol. 211v and ASR, TNC, uff. 15, 1627, pt. 3, vol. 113, fols. 27r.

<sup>36</sup> See Fowler, *Drawing and the Senses*, 79, for a similar conclusion about the goal of pedagogies of drawing in the early modern period.

<sup>37</sup> Roccasacca, “Teaching,” 127–28 and 147.

<sup>38</sup> In his treatise on *disegno* from around 1565, Vincenzo Danti (“Primo libro,” 235–36) gave a more mechanical interpretation of *ritrarre* in which he opposed it to the more intellectual drawing activity of *imitare*, which he described as perfecting nature where it is imperfect.

<sup>39</sup> Roccasacca, “Teaching”; Jonker, “Academization of Art,” 291–313.

<sup>40</sup> The following interpretation of Zuccari's lectures as developing an artist's *disegno interno* and his drawing exercises, *disegno esterno* is hinted at—but not elaborated on—by Roccasacca in “Teaching,” 125.

world. In the fourth and highest stage, students practiced exteriorizing the *disegno interno pratico*, often with the help of their imagination (*fantasia*).<sup>41</sup>

Although similar graduated systems of practical training of *disegno* had existed since the fifteenth century, Zuccari was the first to ground these practices in a philosophical theory and epistemology in which the relation between theory and practice and between hand and mind occupied a central place.<sup>42</sup> Zuccari's theory was more developed than previous ones because it included the process of knowledge acquisition via the senses, hands, and instruments as a counterpart and preliminary process to that of artistic production. From Zuccari's perspective, the ability to render a realistic representation of an object or a scene in three dimensions attested to an artist's knowledge and understanding of nature.<sup>43</sup>

Zuccari's conception of *disegno* and the academy's curriculum were also connected to existing social hierarchies. He described artists who had received praise for executing public commissions based on their *disegni* as *valentuomini* (worthy men) or *accademici utili e honorati* (useful and honorable academicians). At the opposite end of the socio-economic spectrum in early modern Rome were artists who earned modest wages as assistants in the workshops of others or sold mediocre works on the art market, often in series and based on *disegni* of others. This indicates that their skills corresponded to that which students learned in Zuccari's second and third *capate*. Contemporary sources described such artists as *pittori grossi* ("coarse painters").<sup>44</sup> Zuccari would have agreed with this description although he did not use the term himself. These artists were not eligible for membership in the academy but were obliged to enroll in the Compagnia. However, many of them never joined either branch of the institution.

### **Disegno in the Accademia dei Lincei**

The question now is if Zuccari's conception of *disegno* and his step-by-step curriculum for the Accademia di San Luca can help us understand the functions of both the images and the artists themselves in the knowledge practices of the Accademia dei Lincei. This section provides a general answer to this question by connecting Zuccari's ideas to the Lincei's visual epistemology and to their relationships with artists in the production and dissemination of knowledge. As such, it prepares the ground for more detailed and nuanced analyses—which lie outside the scope of this article—of the epistemic functions of the numerous images in the different Lincean projects through the lens of Zuccari's theory and practice of *disegno*.

The importance of images in the Lincei's projects is evident not just from the sheer quantity of graphic material produced but also from the testimonies in their correspondence, notes, and publications. The name "academy of the lynxes," or "lynx-eyed," is telling in this respect. It refers to the feline species that, according to legend, possessed vision so acute that it could see beneath the surface of things. In a programmatic lecture in 1616 in which Cesi presented the ideological and moral principles of his academy, he explained that this acute and penetrating vision should also—perhaps primarily—be understood as that of the *mind's* eye of the institution's members. According to the president, their keen vision allowed them to perceive "minutely and diligently, both inside and outside ... all of the objects that present themselves in this great theatre of nature."<sup>45</sup> Cesi's explanation of the Linceans' vision as both corporeal and intellectual and directed towards both the surface and the interior of natural objects fits perfectly with Zuccari's conception of *disegno* as a process in which the senses and the intellect work together to obtain knowledge of Forms, or universals. However, in this explanation there is no link between the Linceans' vision and their use of images or artists.

Cesi, however, does make this connection in a letter to his colleagues written in 1605 in which he discussed the academy's goals and how these should be attained. One of his points relates to its use of artists and images: "The copper engraver (*disegnatore in rame*) will be most useful to our order, since in printing the Lincean writings the greatest expense will be in the figures, hence we will advance on this matter and we will be able to represent our every observation and *capriccio*."<sup>46</sup> There are three things that can be taken away from this passage. It shows first that at this early stage in the academy's existence, the Lincei were already aware of the importance of images for their scientific projects. Second, it demonstrates their commitment

<sup>41</sup> Rossi, "Idea e accademia," 49–50.

<sup>42</sup> Previously, Leonardo da Vinci (1452–1519) and Vasari advanced gradual teaching systems of drawing. See Vasari, *Vite*, 1:112–15; Fowler, *Drawing and the Senses*, 75 and 90–91.

<sup>43</sup> Roccasecca, "Teaching," 149.

<sup>44</sup> Cavazzini, *Painting as Business*, 26.

<sup>45</sup> Cesi, *Natural desiderio*, 126–27.

<sup>46</sup> Gabrieli, *Carteggio linceo*, 67 (no. 24): "Utilissimo sarà il disegnatore in rame per il nostro ordine, poiché nel stamper i componenti delli Lynceai la maggior spesa sarebbe nelle figure, onde avanzaeremo questo et potremo figurare ogni nostra osservatione et capriccio."

to hiring professional artists, or *disegnatori*, to produce these images. Third, it shows that these images should represent not only their observations but also their *capricci*, which can be translated as “fantasies,” “whims,” or “thoughts.” In other words, the images produced by the Lincei should represent both the things experienced by their corporeal senses and the things perceived by their mind’s eye—in Zuccari’s terms, the objects formed by their *disegni interni*.<sup>47</sup>

That the Lincei visually recorded their observations at this early date can be seen in an unpublished manuscript that consists of images and descriptions of the plants that Van Heeck encountered on his journey through northern Europe at the beginning of the seventeenth century (**Figure 3**). The manuscript contains images drawn with a pen and then colored with watercolor and varnished. The artist could have been Van



**Figure 3:** A page from Johannes van Heeck, *De vegetalibus*, ms. H. 507, 123v, BU historique de médecine, Bibliothèque interuniversitaire de Montpellier, Montpellier, FR (BIU Montpellier, Service photographique).

<sup>47</sup> In this context, Cesi’s interesting, albeit elliptical, remarks on what he calls *pittura filosofica* (philosophical painting) should be mentioned. With this notion, he expressed the idea that art can and should be used as an instrument in the understanding of nature. Baldriga, *Occhio della lince*, 13–15 and 259.



Heeck himself or the draftsman he mentions in one of his letters to his colleagues in Italy.<sup>48</sup> For each plant he observed, Van Heeck recorded its Latin name at the top of the page and wrote (in Dutch) a description of its appearance and the precise location where it was collected. Together, the textual descriptions and the color drawings functioned as field notes that could later help him use his observations to identify a plant and, ultimately, construct a taxonomy.<sup>49</sup> The artistic skill level required for rendering these images corresponded to Zuccari's second *capata* in which students had to accurately copy or portray two- and three-dimensional figures. At this level, not much understanding of the objects depicted was required. On the contrary, it was the act of *ritrarre dal naturale* ("drawing from nature") itself that led to a more profound understanding of the objects. In other words, the drawings in Van Heeck's manuscript were supposed to help the Lincei extract the Forms of the plant species in question.

For the exteriorization of the natural knowledge attained by the Lincei, we turn the publication that cost them the most effort, money, and time to realize—the *Rerum medicarum Novae Hispaniae thesaurus* (Treasury of the Medical Matters of New Spain), better known as the *Tesoro messicano* (Mexican Treasury).<sup>50</sup> A compendium of the natural history of Mexico, it was based on material collected by the Spanish Royal physician Francisco Hernández (ca. 1517–1587) in Mexico in the 1570s. The Lincei obtained an abridged version of Hernández's descriptions around 1610, and they spent the following four decades organizing, annotating, and illustrating them before publishing the completed work between 1648–1651.<sup>51</sup>

The graphic material consists of a frontispiece and almost eight hundred woodcuts of Mexican plants and animals. The frontispiece is a copper engraving that was produced in several versions by Matthäus Greuter (1564–1638) and his son Johann Friedrich (1589–1660) (**Figure 4**). It is a complex composition with many iconographical elements placed on or against an architectural structure. The woodcuts were based largely on color drawings of the plants and animals that had been produced in Mexico by indigenous artists under Hernández's supervision and in some cases on exotic plants that were cultivated in Italian gardens. The names of two of the artists employed by the Lincei to produce these woodcuts are known. The first is Isabella Parasoli (ca. 1565/70–ca. 1625), who was mentioned by the painter and biographer Giovanni Baglione (1566–1643) as having executed prints for Cesi's *Libro dell'herbe* (Book of Herbs), which referred to the *Tesoro messicano*.<sup>52</sup> The second is an artist named Giorgio Nuvolostella (d. 1624). The archive of the academy contains a draft of the contract between the Nuvolostella and Cesi drawn up in October 1619 in the latter's palace in Acquasparta. It specified that he must complete eight figures per month for which he would receive 7 *scudi* and 25 *baiocchi* as well as a daily portion of bread and wine.<sup>53</sup>

According to Zuccari's theory of *disegno*, the production of a complex composition with multiple iconographical elements—as in the case of the frontispiece of the *Tesoro messicano*—required more cognitive capacity and thus more *disegno interno* from the artists than the creation of woodcuts representing individual plants and animals. The difference in the cognitive capacity required to create works of varying complexity raises the issue of social difference among the artists who produced different types of works. For example, whereas Parasoli and Nuvolostella do not seem to have had a direct personal connection to the Accademia di San Luca, Johann Friedrich Greuter was one of the institution's teachers in the 1620s.<sup>54</sup> Moreover, between the socio-economic extremes of *valentuomo* and *pittore grosso*, the Greuters gravitated towards the former and Parasoli and Nuvolostella towards the latter. This difference can be seen, for instance, in Nuvolostella's contract, which earned him a modest salary and was not the kind of important public commission that *valentuomini* such as Zuccari and Cigoli were looking for.

Another indication of relationship between the social status and artistic ability of the artists the Lincei employed to produce the woodcuts of the *Tesoro messicano* is the involvement of the natural philosophers themselves in the production process. Since the artists would probably not have had the botanical knowledge required to distinguish the essential from the accidental features of a plant, the Lincei closely scrutinized them and their work. Such oversight is evident in the preparatory woodcuts of the plants dating from the early 1610s that are now in the Biblioteca Apostolica Vaticana. These prints contain the names of the plants in Nahuatl (the most important indigenous language of Central America), botanical annotations,

<sup>48</sup> In a letter from December 19, 1604 Van Heeck wrote that he had taken in his service a young engraver to record the most notable things of his trip. Gabrieli, *Carteggio linceo*, 46 (no. 18).

<sup>49</sup> For the notational function of botanical images, see Dackerman, "Introduction," 20.

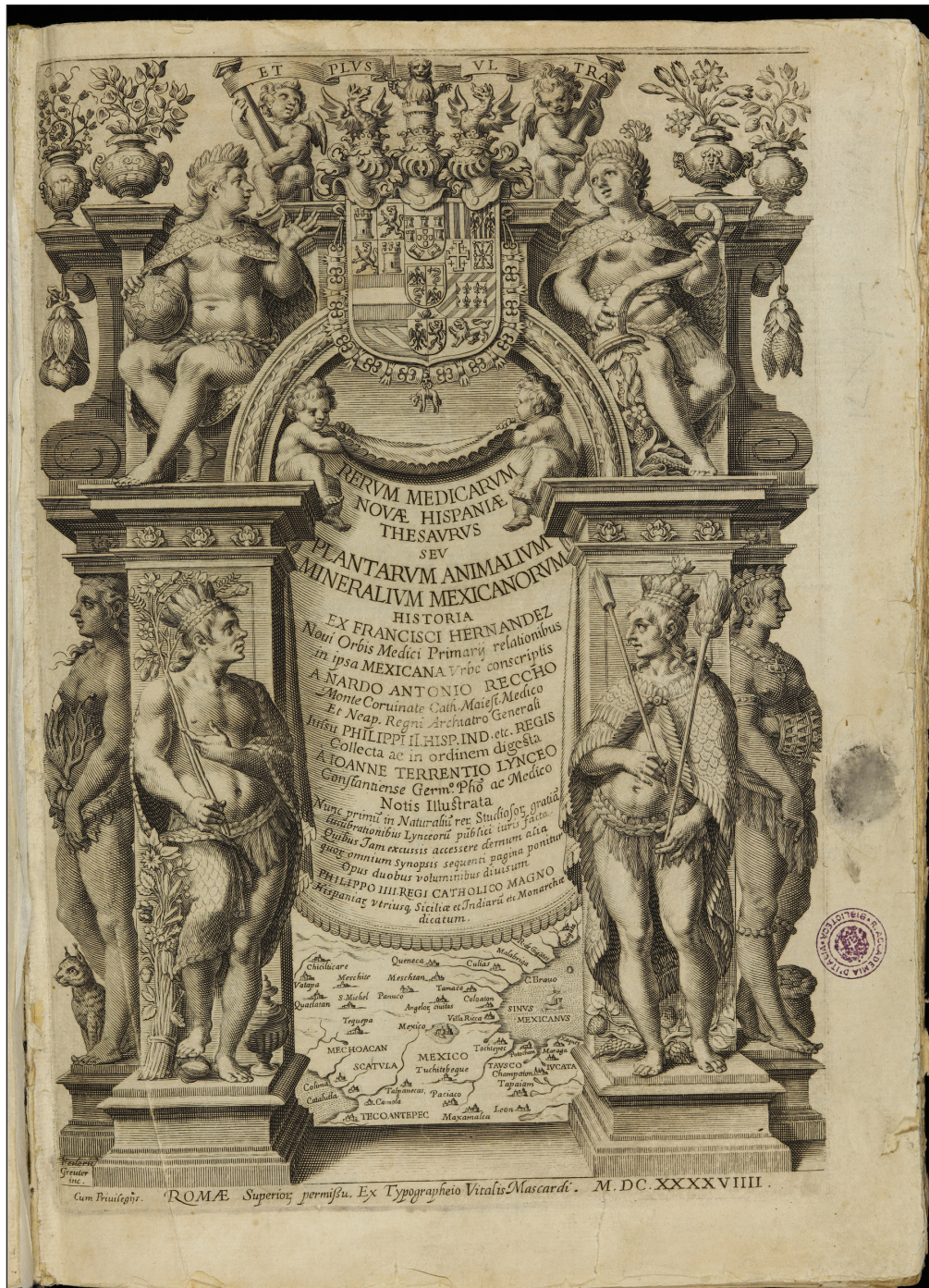
<sup>50</sup> Hernández et al., *Rerum medicarum*.

<sup>51</sup> Cadeddu and Guardo, *Tesoro Messicano*; Jonker, "Accademia dei Lincei's network."

<sup>52</sup> Baglione, *Vite*, 395; Tongiorgi Tomasi, "Femminil Pazienza," 163–64.

<sup>53</sup> BANL, MS Archivio Linceo IV, 372r–v.

<sup>54</sup> ASR, TNC, uff. 15, 1624, pt. 4, vol. 102, 247r and ASR, TNC, uff. 15, 1625, pt. 2, vol. 105, 441r.

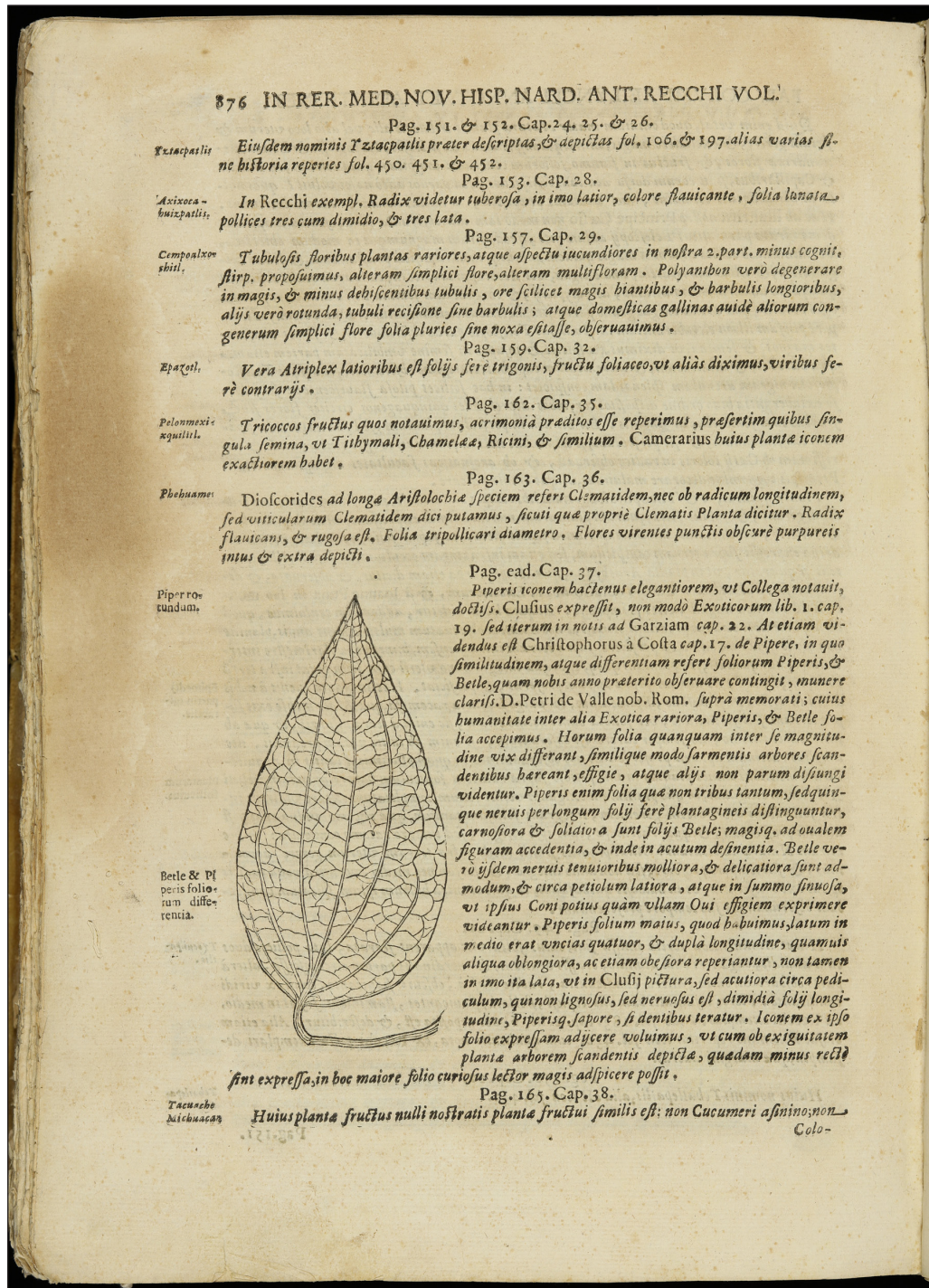


**Figure 4:** Matthäus and Johann Friedrich Greuter's frontispiece to Hernández et al.'s *Rerum medicarum* 1648–1651 (by permission of the Accademia Nazionale dei Lincei).

and, in some cases, directions for the woodcutter. For example, a note in Cesi's hand on one of the prints reads: "these leaves have to be seen in the original, [because] I don't like them and they are unwrapped and striped in the length."<sup>55</sup> The woodcut to which Cesi was referring was subsequently redone, which is evidenced in the fact that it is represented in reverse in the *Tesoro messicano*. It was accompanied by another image of the same plant showing the leaves folded along their length in accordance with Cesi's instructions.

<sup>55</sup> BAV, Stampe.I.81. The image cited can be found on 56 and represents the Tozcuilapil Xochitl (Nahuatl). It is described on page 282 of the *Tesoro Messicano*. The Italian reads: "queste foglie bisogna vederle al originale, che no(n) mi piacciono e vanno scartocciate e striate per il lungo."

Another example of the Lincei's scrutiny of the artists they employed can be found in their correspondence. When working on the annotations for his part of the *Tesoro messicano* in 1628, Fabio Colonna wrote from Naples to his colleague Stelluti in Rome about his concerns regarding the accuracy of one of the images: "[i]t is necessary to see if the painter of the leaf of the pepper plant has expressed what it says in my annotation."<sup>56</sup> Colonna was referring here to his annotation of the *Piper rotundum* (Black pepper), which was accompanied by a large image of the leaf of the plant (**Figure 5**). In focusing on a single part of the



**Figure 5:** Description and woodcut of the *Piper rotundum* from Hernández et al., *Rerum medicarum* 1648–1651, 876 (by permission of the Accademia Nazionale dei Lincei).

<sup>56</sup> Gabrieli, *Carteggio linceo*, 1117 (no. 974): "Bisogna veder se il pittore della foglia del Pepe ha espresso quel che si dice nell'annotazione mia."

plant, this illustration is very different from another one of the same species in a part of the book that was prepared in the early 1610s by one of Colonna's colleagues (Figure 6). In this case, the plant is represented in its entirety, its leaves are much more crudely rendered than the one accompanying Colonna's text. In his annotation, Colonna mentioned that he had received some leaves of a pepper plant from a friend and that

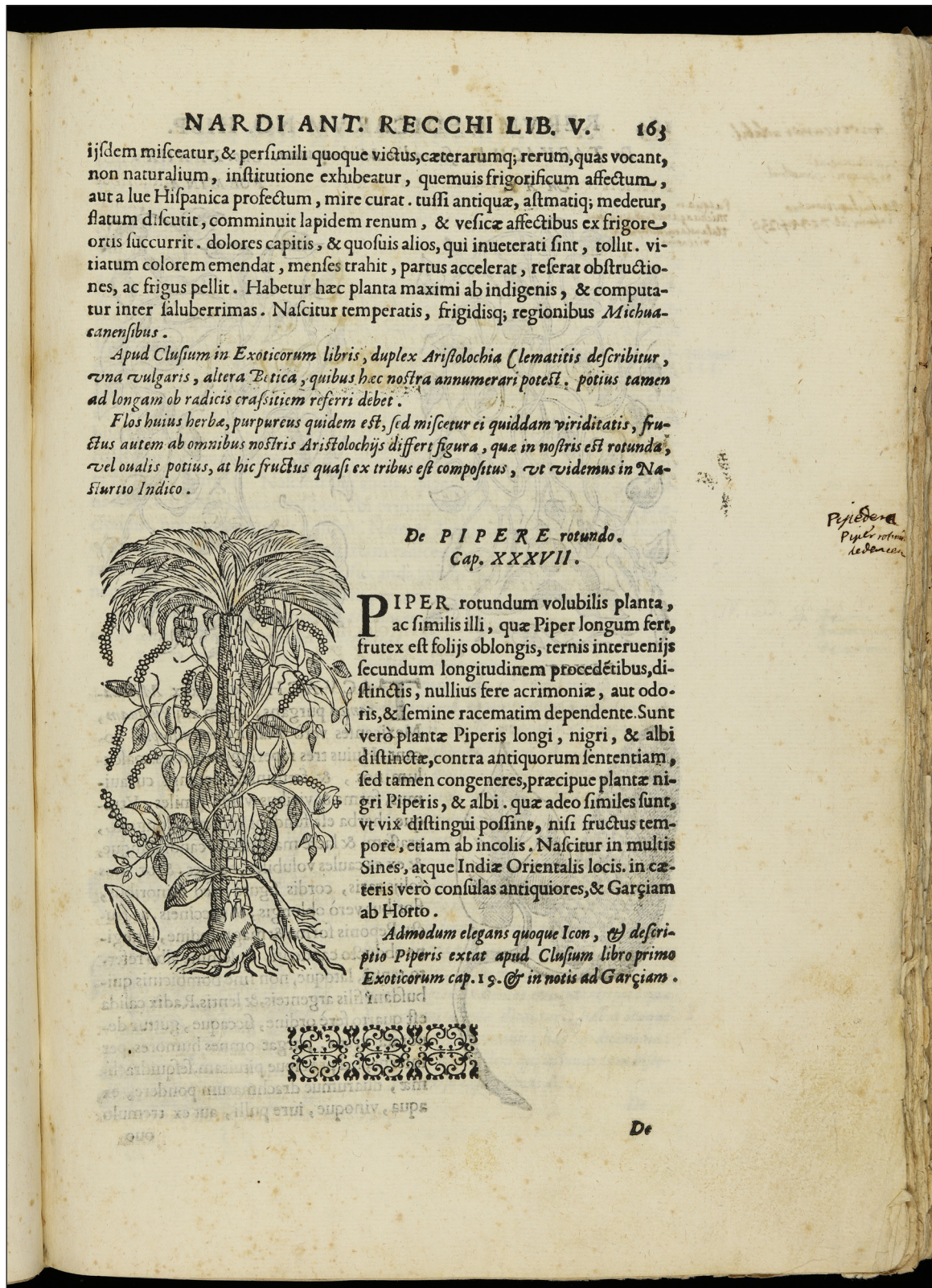


Figure 6: Description and woodcut of the *Pipere rotundo* from Hernández et al., *Rerum medicarum* 1648–1651, 163 (by permission of the Accademia Nazionale dei Lincei).

this had allowed him to examine the leaf closely and to see that it had five instead of three nerves along its length. The leaf's nerves are clearly visible in the woodcut adjacent to his annotation. Therefore, it appears that the artist had indeed adequately "expressed" what Colonna had written in his annotation and thereby exteriorized the natural philosopher's *disegno interno*.

Thus, the skills the Linceans demanded from most of their artists corresponded to the skills acquired by students in the first two stages of Zuccari's training program. The examples discussed above have shown that the Lincean artists were supposed to portray faithfully single organisms, or parts thereof, from life or from existing drawings. Put into the terms of Zuccari's theory of *disegno*, in the process of knowledge acquisition, the Linceans used artists and artistic images to extract the *disegni esterni* from the organisms and to form *disegni interni (speculativi)* in their minds. In the act of publishing the resulting knowledge in the *Tesoro messicano*, they used the artists to transfer the *disegno interno pratico* from their minds to a sheet of paper or a woodblock. In other words, the artists functioned as the natural philosophers' instruments in analyzing and identifying plant, animal, and mineral specimens. They were aids to and, in a certain sense, improved versions of the natural philosophers' senses and hands.

From Zuccari's perspective, most of the images produced in the Lincean scientific projects would not be considered true artistic products or the work of master artists because they only required the skill level attained by students in their second *capata*. In other words, such images required the skills used in the first part of the process of *disegno*, namely knowledge acquisition, not those used in the second part, namely artistic production. Zuccari expected more from the artists in the Accademia di San Luca. He urged them to take further steps and ultimately develop and exteriorize their own *disegno interni* without using any models or the aid of their *fantasia*. Of the examples discussed above, only the frontispiece by father and son Greuter falls within this category.

## Conclusion

This article has sought to show that our understanding of the relationship between science and art in the early modern period can be improved by focusing on contemporary art theory, art education, and the division of labor between natural philosophers and artists in the production of knowledge. The analysis of Alberti's narrative has shown that Zuccari was not satisfied theoretically with only connecting the processes of knowledge acquisition and artistic production to each other but that he also sought to implement this central tenet of his conception of *disegno* in the practical training of artistic education.

By connecting Zuccari's theory to contemporary scientific activities of the Accademia dei Lincei, this paper has further illuminated its practical implications. In turn, Zuccari's double-layered notion of *disegno* in combination with his ideas for the Accademia di San Luca's curriculum have furthered our understanding of the functions of the images as well as the artists themselves in the the Lincei's knowledge practices. From the perspective of Zuccari's theory, both functioned as instruments in the processes of knowledge acquisition and dissemination. This conclusion can be used as the basis for further research on the relationship between science and art in the early modern period. In particular, one could focus on and compare the epistemic functions of the images produced and collected by the members of the Lincei in their various projects.

## Competing Interests

The author has no competing interests to declare.

## Bibliography

### **Archival sources and manuscripts**

Archivio di Stato di Roma (ASR), Rome. Trenta Notai Capitolini, ufficio 15 (TNC, uff. 15).

Archivio Storico dell'Accademia Nazionale di San Luca (AASL), Rome.

Biblioteca Apostolica Vaticana (BAV), Vatican City.

Biblioteca dell'Accademia Nazionale dei Lincei (BANL), Rome.

### **Other sources and literature**

Alberti, Romano. "Origine, et progresso dell'Accademia del Disegno de Pittori, Scultori, et Architetti di Roma." In *Scritti d'arte di Federico Zuccari*. Fonti per lo studio della storia dell'arte inedite o rare 1. (Pavia: Pietro Bartoli, 1604). Facsimile, edited by Detlef Heikamp, 1–99. Florence: Leo S. Olschki, 1961.

- Baglione, Giovanni. *Le vite de' pittori, scultori et architetti: dal pontificato di Gregorio XIII del 1572, in fino a' tempi di Papa Urbano Ottavo nel 1642*, edited by Jacob Hess and Herwarth Röttgen. Vatican City: Biblioteca Apostolica Vaticana, 1995.
- Baldriga, Irene. *L'Occhio della Lince: I Primi Lincei tra Arte, Scienza e Collezionismo 1603–1630*. Rome: Accademia Nazionale dei Lincei, 2002.
- Barzman, Karin-edis. *The Florentine Academy and the Early Modern State: The Discipline of Disegno*. Cambridge, UK: Cambridge University Press, 2000.
- Battistini, Andrea, Gilberto De Angelis, and Giuseppe Olmi, eds. *All'origine della scienza moderna: Federico Cesi e l'Accademia dei Lincei*. Bologna: Società editrice il Mulino, 2007.
- Bredenkamp, Horst. "Gazing Hands and Blind Spots: Galileo as Draftsman." In *Galileo in Context*, edited by Jürgen Renn, 153–92. Cambridge, UK: Cambridge University Press, 2001. DOI: <https://doi.org/10.1017/S0269889701000333>
- Cadeddu, Maria Eugenia and Marco Guardo, eds. *Il Tesoro Messicano: Libri e saperi tra Europa e Nuovo Mondo*. Florence: Leo S. Olschki, 2013.
- Cardi, Giovanni Battista. *Vita di Lodovico Cardi Cigoli 1559–1613*. Comune della città di S. Miniato, 1913.
- Cavazzini, Patrizia. *Painting as Business in Early Seventeenth-Century Rome*. University Park, PA: The Pennsylvania State University Press, 2008.
- Cesi, Federico. *Il natural desiderio di sapere: testo bilingue/The Natural Desire for Knowledge: Bilingual Text*. Vatican City: Pontificia Academia Scientiarum, 2003.
- Dackerman, Susan. "Introduction: Prints as Instruments." In *Prints and the Pursuit of Knowledge in Early Modern Europe*, edited by Susan Dackerman, 19–35. Cambridge, MA: Harvard Art Museums; New Haven: Yale University Press, 2011.
- Danti, Vincenzo. "Il primo libro del trattato delle proporzioni di tutte le cose che imitare e ritrarre si possano con l'arte del disegno." In *Trattati d'arte del Cinquecento fra manierismo e controriforma*. Vol. 1, edited by Paola Barocchi, 207–69 and 324–28. Bari: Giuseppe Laterza & Figli, 1960.
- Daston, Lorraine. "Epistemic Images." In *Vision and Its Instruments: Art, Science, and Technology in Early Modern Europe*, edited by Alina Payne, 13–35. University Park, PA: Pennsylvania University Press, 2015.
- Edgerton, Samuel. *The Heritage of Giotto's Geometry: Art and Science on the Eve of the Scientific Revolution*. Ithaca, NY: Cornell University Press, 1991.
- Fowler, Caroline O. *Drawing and the Senses: An Early Modern History*. Turnhout: Brepols, 2016.
- Freedberg, David. *The Eye of the Lynx: Galileo, his Friends, and the Beginnings of Modern Natural History*. Chicago: University of Chicago Press, 2002. DOI: <https://doi.org/10.7208/chicago/9780226261539.001.0001>
- Gabrieli, Giuseppe. *Il carteggio linceo*. Rome: Accademia Nazionale dei Lincei, 1996.
- Galluzzi, Paolo. *The Lynx and the Telescope: The Parallel Worlds of Cesi and Galileo*. Leiden: Brill, 2017. DOI: <https://doi.org/10.1163/9789004342323>
- Hernández, Francisco, Nardo Antonio Recchi, and Johannes Terrentius. *Rerum medicarum Novae Hispaniae thesaurus seu plantarum animalium mineralium Mexicanorum historia*. (Vitalis Mascardi, 1648–1651). Anagraphic reprint. Rome: Istituto Poligrafico e Zecca dello Stato, Libreria dello Stato, 1992. DOI: <https://doi.org/10.5962/bhl.title.53514>
- Jonker, Matthijs. "The Academization of Art: A Practice Approach to the Early Histories of the Accademia del Disegno and the Accademia di San Luca." PhD diss., University of Amsterdam, 2017.
- Jonker, Matthijs. "The Accademia dei Lincei's network and practices in the publication of the *Tesoro messicano*." *Incontri* 34, no. 1 (2019): 19–35. DOI: <https://doi.org/10.18352/incontri.10283>
- Kemp, Wolfgang. "Disegno: Beiträge zur Geschichte des Begriffs zwischen 1547 und 1607." *Marburger Jahrbuch für Kunstwissenschaft* 19 (1974): 219–40. DOI: <https://doi.org/10.2307/1348597>
- Kusukawa, Sachiko. "Uses of Pictures in Printed Books: The case of Clusius' *Exoticorum libri decem*." In *Carolus Clusius: Towards a Cultural History of a Renaissance Naturalist*, edited by Florike Egmond, Paul Hoftijzer, and Robert P. W. Visser, 221–46. Amsterdam: KNAW, 2007.
- Lukehart, Peter M. ed. *The Accademia Seminars: The Accademia di San Luca in Rome, c. 1590–1635*. CASVA Seminar Papers 2. Washington, DC: The National Gallery of Art, 2009.
- Marcaída López, José Ramón. *Arte e ciencia en el Barroco español: Historia natural, coleccionismo y cultura visual*. Madrid: Marcial Pons Historia, 2014.
- Marr, Alexander. "Knowing Images." *Renaissance Quarterly* 69, no. 3 (2016): 1000–1013. DOI: <https://doi.org/10.1086/689040>
- McBurney, Henrietta. "'So Many Celestial Animals so Vividly Drawn': The Drawings of Birds in the Paper Museum." In *Birds, Other Animals and Natural Curiosities*, edited by Henrietta McBurney, Paula Findlen,

- Caterina Napoleone, and Ian Rolfe, vol 2, 48–75. The Paper Museum of Cassiano dal Pozzo Series B: Natural History – Parts IV/V. London: Brepols, 2017.
- Panofsky, Erwin. *Idea: A Concept in Art Theory*. Translated by Joseph J. S. Peake. New York: Harper and Row, 1968. Originally published as *“Idea”: Ein Beitrag zur Begriffsgeschichte der älteren Kunsttheorie* (Leipzig: B. Teubner Verlag, 1924).
- Pfisterer, Ulrich. “Die Entstehung des Kunstwerks: Federico Zuccaris ‘L’Idea de’ pittori, scultori, et architetti.” *Zeitschrift für Ästhetik und allgemeine Kunstwissenschaft* 38 (1993), 237–68.
- Roccasecca, Pietro. “Teaching in the Studio of the ‘Accademia del Disegno dei pittori, scultori e architetti di Roma’ (1594–1636).” In *The Accademia Seminars: The Accademia di San Luca in Rome, c. 1590–1635*, edited by Peter Lukehart, 123–159. CASVA Seminar Papers 2. Washington, DC: The National Gallery of Art, 2009.
- Rossi, Sergio. “Idea e accademia: Studio sulle teorie artistiche di Federico Zuccaro, I: Disegno interno e disegno esterno.” *Storia dell’arte* 20 (1974): 37–56.
- Solinas, Francesco. “Cassiano dal Pozzo Linceo e alcuni fogli del Museo cartaceo.” In *Sul Tesoro Messicano & su alcuni disegni del Museo Cartaceo di Cassiano dal Pozzo*, edited by Sabina Brevaglieri, Luigi Guerrini, and Francesco Solinas, 93–137. Rome: Edizione dell’Elefante, 2007.
- Solinas, Francesco. “La pittura filosofica e la nascita dello ‘stile barberini.’” In *Estetica Barocca*, edited by Sebastian Schütze, 241–62. Rome: Campisano Editore, 2004.
- Solinas, Francesco. “Osservazione della natura e ‘pittura filosofica’ nella Roma dei primi Lincei.” In *Il cannocchiale e il pennello: Nuova scienza e nuova arte nell’età di Galileo*. Florence: Giunti, 2009. Exhibition catalog Pisa, Palazzo Blu, 9 May–19 July 2009.
- Summers, David. *The Judgment of Sense: Renaissance Naturalism and the Rise of Aesthetics*. Cambridge, UK: Cambridge University Press, 1987.
- Tognoni, Federico ed. *Il carteggio Cigoli-Galileo 1609–1613*. Pisa: Edizione ETS, 2009.
- Tognoni, Federico. “Nature Described: Fabio Colonna and Natural History Illustration.” *Nuncius* 20, no. 2 (2005): 347–70. DOI: <https://doi.org/10.1163/221058705X00028>
- Tongiorgi Tomasi, Lucia. “‘La femminil pazienza’: Women Painters and Natural History in the Seventeenth and Early Eighteenth Centuries.” *Studies in the History of Art* 69 (2008): 158–85.
- Vasari, Giorgio. *Le vite de’ più eccellenti pittori, scultori et architettori: nelle redazioni del 1550 e 1568*. Edited by Rosanna Bettarini and commentary by Paola Barocchi. Florence: Sansoni, 1966.
- Williams, Robert. *Art, Theory, and Culture in Sixteenth-Century Italy: From Techne to Metatechne*. Cambridge, UK: Cambridge University Press, 1997.
- Zuccari, Federico. “L’Idea de’ pittori, scultori et architetti.” In *Scritti d’arte di Federico Zuccari*. Fonti per lo studio della storia dell’arte inedite o rare 1. (Turin: Agostino Disserolio, 1607). Facsimile, edited by Detlef Heikamp, 2 vols, 133–312. Florence: Leo S. Olschki, 1961.

**How to cite this article:** Jonker, Matthijs. “Producing Knowledge in Early Modern Rome: Concepts and Practices of *Disegno* in the Accademia di San Luca and the Accademia dei Lincei.” *Journal for the History of Knowledge* 2, no. 1 (2021): 3, pp. 1–15. DOI: <https://doi.org/10.5334/jhk.8>

**Submitted:** 15 September 2019

**Accepted:** 29 June 2020

**Published:** 18 June 2021

**Copyright:** © 2021 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC-BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. See <http://creativecommons.org/licenses/by/4.0/>.



*Journal for the History of Knowledge* is a peer-reviewed open access journal published by Ubiquity Press.

