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Aldrovandi, Truthfully Drawing Naturalia, and Local Context¹

Abstract

This essay focuses on the 16th-century Bolognese naturalist and collector Ulisse Aldrovandi (1522-1605) and his enormous image collection of naturalia. Do these images present a specifically Bolognese form of visual natural science, and was his visual format of truthfulness new at the time? Did local visual culture leave clear marks on Aldrovandi's image collection?

Ulisse Aldrovandi's (1522-1605) contacts with, and influence on, painters from Bologna and Emilia Romagna have been the subject of attention ever since the late 16th century. In recent times especially Giuseppe Olmi, Alessandro Tosi, Lucia Tongiorgi Tomasi, and Fulvio Simoni have gone deeply into Aldrovandi's image production and artistic context.² A recurring theme in these discussions is the strong relationship between close observation and lifelike depiction. Art historically speaking, this involves key terms such as mimesis and naturalism; in the history of science the concepts used are more often truthfulness, scientific accuracy, and epistemic images. As Mattia Biffis phrased it, "for social and cultural reasons Bologna had a sort of special attraction for this concept [i.e. truth], from an either factual or religious perspective, that can be modelled and declined in different contexts: from Carracci's 'arte dal naturale' to Paleotti's *Discorso*, from Malvasia's 'ispezione oculare' to Aldrovandi's new naturalism".³

According to Aldrovandi's own documentation, he was in personal contact with Bolognese painters such as Bartolomeo Passarotti, Francesco Cavazzoni, 'Bagnacavallo' (Bartolomeo Ramenghi), the latter's pupil Cesare Aretusi, and the Procaccini family. Aldrovandi also advised Orazio Samacchini and 'Lorenzino' (Lorenzo Sabbatini) about how best to paint

¹ With thanks to Mattia Biffis and the participants of the workshop *The Art of Truth Providing Evidence in Early Modern Bologna* organized by The Norwegian Institute in Rome – University of Oslo, 31 October 2019; to Peter Mason for critically reading the whole text and for his beautiful English translations of the quotations from Aldrovandi's letters; and to Giuseppe Olmi for his expert advice: without his work on Aldrovandi the present text could not have been written.

² Key publications with many further references are Olmi 1992 – of which a revised edition is to appear; Olmi 2010; Olmi, Simoni 2018; Olmi, Tongiorgi Tomasi 2018; and Tosi 2018.

³ Biffis, in his introduction to the workshop – see note 1.

certain animals and plants; he let them use his own image collection as models.⁴ Whether this should lead us to infer that Aldrovandi helped to shape a particular, truthful Bolognese visual culture goes well beyond the scope of this contribution. My interest is more restricted, and concerns Aldrovandi's own collection of naturalia drawings and their visual qualities as epistemic images – which I understand as images created with the specific aim to convey, transmit and construct knowledge.⁵

The Aldrovandi naturalia collection is one of the few from early modern Europe that (occasionally) still allows a direct comparison between the original object (kept in Palazzo Poggi, Bologna), its representation in a coloured drawing commissioned by Aldrovandi, the woodblock cut on the basis of that model drawing, and the printed woodcut in one of Aldrovandi's many published volumes (FIG. 1). I do not intend to establish degrees of visual truthfulness here, however, by tracing minute changes from object to drawing, and then on to woodblock and eventually printed illustration. Instead, I would like to examine to what extent the Aldrovandi naturalia drawings present a specifically Bolognese form of visual natural science, and whether his visual format of truthfulness was new at the time. Do they indeed represent a new naturalism? I will concentrate not on the influence of Aldrovandi and his collection on Bolognese visual culture, therefore, but vice versa, on the question of whether local visual culture left clear marks on Aldrovandi's image collection. These questions are connected with the wider issue of local (or supra-local) articulations of styles of doing science and making knowledge – visually, textually, and by collecting, experimenting, investigating, and documenting.⁶

Aldrovandi's image collection

Aldrovandi had degrees in medicine and philosophy. In 1561 he became the first professor of natural sciences at the university of Bologna, where he stimulated the creation of a public botanic garden (1568). His interests extended to all domains of nature, and he exchanged objects and information concerning nature with many European naturalists and collectors. In the course of more than half a century, c. 1550-c. 1600, his personal collection of naturalia grew exponentially. It eventually contained 14.000 or more objects, besides a massive herbarium, and a series of albums with coloured drawings of plants and animals, painted by various artists. And of course, there were manuscripts, letters, a library, and further textual material.⁷ Aldrovandi assembled his collection systematically and called it a theatre or microcosm of nature. Seen in the context of other early modern collections in Europe, Aldrovandi's collection can perhaps best be described as a research collection with a strong focus on naturalia and encyclopaedic aims.

⁴ Olmi 2010.

⁵ This does not exclude the possibility, however, that epistemic images also have other functions and layers of meaning.

⁶ The literature on these themes is fast growing and closely connected with subjects such as the circulation of knowledge and global / local history. See e.g. Benkert 2019 on 16th-century knowledge making and naturalia collecting in Basel; and Brevaglieri 2019 on early 17th-century Rome. On the spatial turn, e.g. Finnegan 2008. For discussions on knowledge circulation, see Raj 2010; Burghartz *et al.* 2016; Dupré *et al.* 2016; and Östling *et al.* 2017. I do not know of studies that specifically focus on visual cultures of science as linked to either local cultures or international circulation; but see Egmond, Kusakawa 2016.

⁷ See the literature mentioned in note 2, and also Tosi 2005 and 2014.

By the late 16th century, Aldrovandi's collection of naturalia *drawings* had become probably the largest and most important one in Europe. The extant part consists of 18 volumes, which comprise over 2900 drawings.⁸ Since most of the drawings cannot be individually dated, it is impossible to reconstruct the chronology of the image collection's development in any detail, but a major part of these drawings was probably created in the decades c. 1560-c. 1590. Additions continued to arrive until Aldrovandi's death in 1605.⁹ The organization of Aldrovandi's drawings too poses almost unanswerable questions: the albums as we can still see them were bound during Aldrovandi's lifetime in a way that flouts both practical sense and natural order. He roughly clustered sets of images by subject (human beings, plants, animals) or sub-set (e.g., insects, shells), but most volumes are not devoted to one such set or subject (FIG. 2). Some of the extant volumes contain several clusters, thus containing successive groups of, for instance, four-footed animals, fish, birds, human 'monsters', and plants. Some other volumes contain only one category (e.g., birds, plants). Images, or image clusters appear to have been bound in the volumes roughly in the order in which they arrived in Aldrovandi's collection.¹⁰ But since the volumes themselves are undated, the present order of the images does not assist in the reconstruction of how Aldrovandi's interests as a naturalist and collector developed over the decades.

Styles of collecting and depicting

Unlike many other 16th-century European naturalists, Aldrovandi was no great traveller, nor did he spend years abroad or in other parts of Italy. Bologna was and remained his basis of operations for more than 50 years between c. 1550 and his death. It seems natural, therefore, to expect stronger links with a local scientific and visual culture in his case than, for instance, for contemporary naturalists such as Pietro Andrea Mattioli (1501-1577) – who came from Tuscany, spent a formative period in and near Trent, and lived for years in Gorizia and at the Habsburg imperial court in Prague – or Carolus Clusius (1526-1609), who was born in the Southern Netherlands, and lived and worked in that country, Germany, France, at the Habsburg court in Vienna, in Hungary, and the Dutch Republic, while also travelling to England, Spain and Portugal.

Interestingly, the origins of Aldrovandi's interest in natural science lay not exclusively in Bologna. His stay in Rome as a young man (1549-50) appears to have been crucial to Aldrovandi's scientific development. There, he started out by systematically studying the antiquities that were at the time visible and visitable.¹¹ His 18th-century biographer Fantuzzi emphasizes that the erudite company in Rome of fish experts such as Paolo Giovio (1483-1552), Ippolito Salviani (1514-1572), and Guillaume Rondelet (1507-1566) stimulated Aldrovandi

⁸ These *Tavole* are all accessible online and now organized in 10 volumes of which several consist of two volumes. See University Library Bologna <http://aldrovandi.dfc.unibo.it/pinakesweb/UlisseAldrovandiIt.asp>. Specifically on the drawings collection, see Alessandrini, Ceregato 2007.

⁹ Approximate dating is sometimes possible in cases of copying after material donated by other collectors or copied after drawings made by painters elsewhere; for further details see below.

¹⁰ Personal information Giuseppe Olmi (August 2014).

¹¹ This resulted in Aldrovandi 1556, an (unillustrated) work about Rome's antiquities. See on this link naturalia-antiquities also Acciarino 2016, 172.

to extend his interest from antiquities to naturalia – first of all to fish and other water creatures (*aquatilia*), only later to plants. The fish and fish drawings that he examined and probably collected in Rome in these years thus constituted the very beginning of Aldrovandi's collecting practice and nature study.¹² The fluid transition in Aldrovandi's mind from the study of antiquities to that of naturalia that originated in Rome did not disappear in his later life. In 1577, almost thirty years after his stay in Rome, Aldrovandi wrote to Grand Duke Francesco I de' Medici (1541-1587) about naturalia and the collecting of antique medals and coins with their portraits of great emperors and princes of the past. He compared the two explicitly:

The science and knowledge of plant and animal painting far surpasses that of coins, because in this particular field of knowledge the species in the paintings can be verified because they are eternal according to the philosophers, who consider those [species] and not individuals to constitute true science. But it is impossible to have true knowledge of individual coins because they are of individuals who are already dead; it is impossible to attain information about them or to verify whether the image of some emperor was done 'from life' or not. But regarding paintings of plants and animals it is possible to attain very secure knowledge of those that are found in nature as the natural species are perpetual¹³

Clearly the antique coins had made him think deeply about the (im)possibility of verifying the truth claims of representations of living beings. It does not seem exaggerated, therefore, to argue that one of Aldrovandi's earliest encounters with models of accurate representation and depicting truthfully came from a setting outside Bologna and from a subject that any modern reader would place well outside natural science.

Bologna and Aldrovandi's painters

As Olmi, Tosi, and Tongiorgi Tomasi have argued, Aldrovandi employed a *bottega* of painters in Bologna in the course of his many decades of collecting and studying naturalia.¹⁴ There was a clear division of tasks. Painters of documentary drawings and of model drawings for print came first in terms of the production process. They were followed by those who transferred selected drawings to woodblocks that would then be handed over to the woodcutters for eventual printing. Aldrovandi's painters did not all work at the same time, however. Some of them coincided in the course of this long period. Others never met. Some painted large quantities of images for him, others only a few.¹⁵ Nor were all of them necessarily always in

¹² Fantuzzi 1774, 13. Cf. Tosi 2018, 54: "Era Aldrovandi a suggerire agli allievi l'indagine botanica come esercizio prioritario nello studio della realtà e della storia naturale, a indicare la «pescharia» come luogo privilegiato della curiosità, palestra formativa come lo era stata per lui ai tempi del soggiorno romano....".

¹³ "Di gran lunga passa la scienza e cognitione della pittura delle piante et animali quella delle medaglie, perché in questa cognitione particolare delle pitture si verificano le spetie che sono eterne secondo i filosofi delle quali è la vera scienza et non de' particolari. Ma delle particolar medaglie non se ne può haver scienza per esser d'individui già morti, de' quali non si può venir in notitia né verificare se fusse la figura dal vivo espressa di quel tale Imperatore o no. Ma dalle pitture delle piante et animali si può venire in cognitione certissima di quelle che in natura si ritrovano, trovandosi perpetue le spetie naturali ...", in the Appendix to his letter to Grand Duke Francesco I de' Medici, 27 September 1577; quoted in Tosi 1989, 241. Aldrovandi's many later contacts with collectors in Venice and Verona would only have reinforced this link between collecting and representing antiquities and naturalia.

¹⁴ See the literature mentioned in note 2.

¹⁵ See Olmi 1992, 64-85; Olmi, Simoni 2018; and Tosi 2018. Some of the earliest information about Aldrovandi's painters goes back to Fantuzzi 1774, 89-90.

Bologna. The person who transferred a drawing to a woodblock and the cutter tended to be present in the same printing shop or atelier. A draughtsman who made the first drawings of a plant or animal was sometimes in the proximity of the naturalist who gave instructions about *how* to depict these naturalia, in the field, at home, or in an atelier. Some painters, however, produced drawings for Aldrovandi ‘at a distance’, as we will see below.

Although Aldrovandi clearly had many personal contacts with painters in Bologna, it is important to note that none of the Bolognese-Emilian painters mentioned in the opening of this article contributed drawings to Aldrovandi’s collection, except Francesco Cavazzoni and a son of Passerotto, who contributed a small number of birds. As the research of Olmi in particular has shown, by far the larger part of Aldrovandi’s animal drawings was made by Giovanni de’ Neri, whom Aldrovandi employed in Bologna and paid for some thirty years, c. 1558-c. 1590. Between about 1558 and 1564 De’ Neri may even have been Aldrovandi’s only painter. De’ Neri’s high production rate – Olmi has calculated that he made on average three figures every five days – is reflected in the unimpressive artistic quality of many of his drawings, which clashes especially with those made by Jacopo Ligozzi (1547-1627). The latter was by far the most famous painter to work for Aldrovandi (from about 1577), but his total contribution to Aldrovandi’s image collection was modest in a quantitative sense: no more than about 30 naturalia drawings in Aldrovandi’s albums can securely be attributed to him, as Olmi argues.¹⁶

Before deciding on a specifically Bolognese style to be connected with Aldrovandi’s bottega of successive painters, a brief examination of the origins of these painters and their formative cultural context is in order.¹⁷ The presence in Bologna during some thirty years of Aldrovandi’s quantitatively most important painter, Giovanni de’ Neri, whom he described as “*il mio Pittore maestro*” (while at the same time complaining about his slowness and lack of artistic quality) is undoubted. He must have been deeply influenced by the local visual culture during these decades. Yet, after his long period in Bologna, this same Giovanni de’ Neri appears to have gone (or returned) to Verona, where he published a treatise about astrology in 1600: on its title page he describes himself as “*pittore Veronese*”. It seems possible, therefore, that Verona was his actual place of origin and the location where he received his early painterly formation.¹⁸

The Veronese background of the painter-miniaturist Jacopo Ligozzi, his less famous brother Francesco and their cousin Francesco Mercurio di Ligozzi who also produced some naturalia drawings for Aldrovandi, is much more securely documented.¹⁹ All came from Ve-

¹⁶ Olmi 1992, esp. 64-70.

¹⁷ Thanks to Fantozzi (1774), and the research by in particular Olmi, Simoni, and Tosi (see note 2), some information is available about these painters. It is, however, scarce even for the most famous among them, Jacopo Ligozzi. I focus here only on the painters of the coloured drawings, not on the woodcutters or others involved in the book production of Aldrovandi, since the latter did not influence the visual format of the drawings.

¹⁸ Neri 1600. See Olmi 1992, 69-70. In a personal communication (Sept. 2020) Giuseppe Olmi has kindly confirmed that the astrologer and the painter are indeed one and the same person; further details will be available in the revised edition (in press) of his 1992 publication.

¹⁹ Olmi (1992, 83-84) mentions that Francesco Ligozzi (also) worked in Venice for Aldrovandi, painting birds, and that he should not be confused with Francesco Mercurio di Ligozzi, a cousin of Jacopo, who also painted naturalia and was in contact with Aldrovandi c. 1590-92.

rona and belonged to an originally Milanese family of painters and embroiderers. They most probably trained in the family workshop in Verona. From 1577, Jacopo entered the service of the Medici in Florence, and his work for Aldrovandi was directly connected with the fact that both were in the patronage of the Medici during a large part of the 1570s-80s. Some of the naturalia images that Jacopo Ligozzi made for Aldrovandi were new creations, while others were copies of his own works produced for the Medici. During his years as Medici court painter Ligozzi was based in Florence; Ligozzi and Aldrovandi met in Florence, and in so far as known Ligozzi was never active as a painter in Bologna. For the Medici, Ligozzi produced a vast range of works, from very large oil paintings to small-scale drawings of precious objects and extremely finely painted naturalia drawings. In the course of the 1570s, probably before his Medici appointment, he also worked in Venice, where he made naturalia drawings on parchment for the herbalist cum barber-surgeon, collector and naturalia dealer Leone Tartaglino (died c. 1576).²⁰ Ligozzi is famous for his high definition and almost hyper-naturalistic drawings of plants and animals. In painterly terms, his work has been connected with the styles and colours of the Veneto and Florence rather than with those of Bologna.

Three further painters who did work in Bologna for Aldrovandi during longer or shorter periods were likewise linked with the Medici and Florence. Lorenzo Benini, who probably worked for two years (c. 1585-87) in Bologna, and as *delineatore* may have been mainly involved in transferring De Neri's drawings to the woodblocks rather than in the creation of new images, was born in Florence and probably trained there. The Tuscan glass painter, medallist and portrait painter Pastorino de' Pastorini worked successively in Ferrara (1554), Bologna (1574) and Florence. The miniaturist Daniel Froeschl (1572/73-1613) came from Augsburg. He received further training from Jacopo Ligozzi, and worked for the Medici in Pisa and Florence (for some ten years from c. 1594), and contributed drawings to Aldrovandi's collection, possibly in Bologna. In 1603 Froeschl was appointed court painter to Emperor Rudolph II in Prague.²¹

From this brief examination, two main cultural circles and geographical regions besides Bologna itself emerge as important to the painterly formation and cultural background of the men who produced images for Aldrovandi's collection: court circles of the Medici in Tuscany; and the Veneto, especially Verona and Venice. Diverse painterly traditions thus contributed to the Aldrovandi naturalia drawings, not only a Bolognese one.

Image loans and copying

The Aldrovandi collection, moreover, contains visual material that originated elsewhere and often had not been made for him in the first place. Some of these drawings were *given* to Aldrovandi (as originals or copies) by persons from the extensive network with whom he

²⁰ The majority of Ligozzi's naturalia drawings (some 78 of plants and 65 of animals) are kept in the *Gabinetto dei disegni e stampe* of the Uffizi in Florence. On Ligozzi and painting naturalia for the Medici, see De Luca, Faietti 2014; Cecchi *et al.* 2014; and Groom 2019. On Aldrovandi and the Medici, see Olmi 2010; and Tosi 2018. On Tartaglino and the Ligozzis, see Conigliello 1991, esp. 23-26; Tosi 2014, esp. 167-170; Hochmann 2008 and 2010; and Findlen 2005, 61-62.

²¹ On all, see Olmi 1992, 64-85. Much of the *Codex Froeschl-De Bruyn*, MS 514 in the University Library of Pisa (discovered by Lucia Tongiorgi Tomasi) seems to date from after 1577; see Garbari, Tongiorgi Tomasi and Tosi 2002.

exchanged information about nature in forms that ranged from textual descriptions to images, dried plants, stones and dead animals.²² He received, for instance, drawings of birds and marsh plants by Teodoro Ghisi, a painter working for the Gonzaga in Mantua, and by an anonymous painter of naturalia whose work was collected by the pharmacist-collector in Mantua Ippolito Serena.²³

In other cases, Aldrovandi himself had copies made of drawings that had been created for collections in other Italian regions. A striking example concerns Aldrovandi's relatively large-scale copying of naturalia drawings from Venice. He borrowed the by then already famous (now lost) collection of *aquatilia* drawings brought together between about 1540 and the mid 1550s by the Venetian patrician, poet, church official, diplomat and humanist Daniele Barbaro (1514-1570), expert on architecture, optics and mathematics as well as one of the founders of the botanical garden in Padua.²⁴ Many of these *aquatilia* drawings had been painted by a certain Maestro Plinio, whom Barbaro employed for eight years at his own expense, with the instruction to depict all sorts of fish, not only from the Adriatic, but also from the Mediterranean, the Black Sea, and the rivers and lakes of Italy. According to the French fish expert Pierre Belon (1517-1564), who met both Barbaro and Maestro Plinio in 1550, there were "many more than three hundred of these paintings all added up".²⁵ Aldrovandi had a whole cluster (or perhaps all) of Daniele Barbaro's Venetian fish drawings copied in the mid 1550s – including a sunfish (*Mola mola*) – and borrowed the latter's fish book again in the late 1560s.²⁶ A list of some 100 fish names in the Barbaro albums, likewise copied by Aldrovandi, includes numerous common Mediterranean fish, but also fish from Flanders, England, and Lake Garda.²⁷

Barbaro generously allowed his collection of fish drawings to travel to Aldrovandi in Bologna and remain there, probably for months at a time while Aldrovandi's painters copied. Leone Tartaglini, the Venetian herbalist mentioned earlier, never let his precious parchment albums (1560s-early 1570s) with naturalia drawings out his sight.²⁸ In this case, Aldrovandi himself went to see those albums in Venice, in October 1571, and had Giovanni de' Neri copy (some of) the drawings, presumably on the spot.²⁹

Several further cases of smaller sets of images copied by and for Aldrovandi have been noted. The presence in Aldrovandi's collection of a number of coloured naturalia drawings by the famous Lombard painter Giuseppe Arcimboldo (1526-1593) is well known. Arcimboldo

²² This practice fitted in perfectly with the customary exchanges of information among European naturalists. See on Clusius, Egmond 2010. For a detailed reconstruction of the exchanging and copying of *aquatilia* drawings between various European naturalists and collectors, including Aldrovandi, see Egmond forthcoming (2022).

²³ Olmi 1992, pp. 98-100.

²⁴ Barbaro's collection of fish drawings was known as the *Libro dei Pesci del Patriarcha*. Aldrovandi refers to it as *Ex Patriarcha De piscibus*. Barbaro also contributed or lent fish images to Ippolito Salviani in Rome. See Pinon 2002, 490-491; cf. Fantuzzi 1774, 218-219. On Barbaro and the Padua garden, see Azzi Visentini 1984, 159-165.

²⁵ Belon 1551, 6v-7r: "*lesquelles peintures sont beaucoup plus de trois cents de compte faits*".

²⁶ Conigliello 1991, 22-26.

²⁷ Aldrovandi's undated list entitled "Ex Patriarcha De Piscibus [...] secundum numerum [...]" must date from after 1550 (when Barbaro was appointed Patriarch of Aquileia); the original is manuscript MS Aldrovandi 136, t. V, University Library Bologna. Hochmann (2010, 52) presents a complete transcription of Barbaro's fish list as copied by Aldrovandi. Cf. Sallent del Colombo 2016, 193; and Sallent del Colombo, Pardo 2018.

²⁸ As is indicated in his last will of 1576. See Brusegan 1996; cf. Hochmann 2010, 49.

²⁹ See Conigliello 1991, 25; Hochmann 2010, 47 and 52; and Tosi 2014, 167-168.

trained in Milan and worked mainly for the Habsburg court in Prague. As DaCosta Kaufmann has argued, the drawings in Aldrovandi's albums attributed to Arcimboldo appear to be original drawings by him and not copies *after* Arcimboldo by one of Aldrovandi's painters. In several cases double or even triple exemplars exist of the same animal – all made by Arcimboldo. At least some of the Arcimboldo drawings of animals “*ad vivum coloribus delineatas*” reached Aldrovandi via the Italian court physician Francesco Padovani in Prague.³⁰ In sending their own doubles to Aldrovandi, Arcimboldo and Ligozzi thus seem to have operated in the same way. It is easy to understand that the fame, individual styles, and position as court painters of these two painters would have made it especially attractive for Aldrovandi to include their original drawings in his collection. It is also easy to imagine, moreover, that it would have been unacceptable to these two painters to have their works copied by lesser artists.

Perhaps even more interesting is a set of four coloured drawings of Mexican fruit-bearing trees in the Aldrovandi collection. Very similar drawings of these same four, rare tropical plants had entered the botanical image collection of Pietro Antonio Michiel in Venice in the course of the 1550s, where they form part of a larger set of 11 drawings of Mexican trees. As Mason and Pardo Tomás have shown in their detailed reconstruction of how these images reached Europe, both the Aldrovandi set and the Michiel set most likely go back to yet other sets of copied drawings based on originals that had reached the Spanish court from Mexico. They quote Aldrovandi as stating (in 1577) that he had received the figures from Portugal: “I had them depicted in my histories after these originals” (FIG. 3).³¹

These few examples give some idea of the complexities in the processes of transmission, circulation and copying of 16th-century epistemic images of naturalia.³² While the large majority of the naturalia drawings in Aldrovandi's collection originated in Bologna, the fact that at least several dozens of images arrived as gifts from elsewhere or were incorporated by copying from other collections raises some interesting questions precisely in the context of presumed *local* visual cultures. If Bolognese visual culture was indeed distinctive, did these incorporations imply the adoption of different visual epistemic formats into Aldrovandi's collection? Or did the copying process itself involve their *adaptation* to a Bolognese truth-format, as represented by his regular painter Giovanni de' Neri?

The visual format of truth

All of this leads us back to the central question of this article: can we actually trace distinct differences between a Bolognese format of truthful representation and the visual formats used elsewhere, in Italy or outside it, for the epistemic representation of naturalia? In other words, was Aldrovandi's visual format Bolognese, and how new or original was his naturalism?

³⁰ Some Arcimboldo animals in Aldrovandi's collections are, for instance, doubles of Arcimboldo drawings in Rudolph II's so-called *Bestiary* (Cod. Min. 129-130 in the Austrian National Library, OENB). See DaCosta Kaufmann 2010, 122-127 and Appendix 3. On the role of Padovani, cf. Olmi 2010, 69-70.

³¹ “*et le feci depingere nelle mie historie da questi originali*”; letter to the Grand Duke of Tuscany, Francesco I de' Medici, of 19 September 1577, quoted in Mason, Pardo Tomás 2019, 228, which reconstructs this transmission in detail.

³² I am not discussing copying *after* Aldrovandi's image collection here. See on this for example: Sallent del Colombo 2016; Sallent del Colombo, Pardo Tomás 2018; and Olmi, Tongiorgi 2018.

We need have no doubts that Aldrovandi did indeed *impose* naturalism as a visual format: it was he who commissioned the larger part of the naturalia drawings in his collection; he who instructed most of his painters; he who collected images; and he who selected which drawings to copy from the collections of others. Moreover, Aldrovandi was explicitly aware of his visual choices, as is also evident from the quotations used here. As Acciarino writes, Aldrovandi emphasized the difference between grotesque and lifelike representations (early 1580s): the latter could serve scientific purposes since they were aiming at lifelikeness, while the former had no immediate connection with nature but with fantasy.³³ Allowing room for differences in style and quality between individual painters, the visual format of his image collection is, as a consequence, more or less constant.

It is not difficult to establish its main characteristics that help to establish the drawings' claim to scientific accuracy, and thus to their role and function as epistemic images. Principal aspects of Aldrovandi's truthful image format are clear outlines and strong lines; a central position of the figure in its destined space on the page; and usually the absence of a background and setting; shadows are used sparingly, more to create basic depth and volume than for any artistic effect. Animals (except insects) are generally presented in profile, while many trees are shown by means of a *pars pro toto*, in which a branch with fruit and flowers represents the whole tree. Animals rarely interact; fruits are never grouped into still life-like compositions. Insects can be found in larger numbers on one sheet of paper, often ordered according to size and shape. All of this formed part of a visual policy that aimed at precision, accuracy, recognizability, and a lack of distraction from the subject.

Yet, this emphasis on naturalism, accuracy and true-to-life representation actually involved a considerable amount of artistic manipulation that regularly led to visual tampering with nature itself in order to produce what can only be called *unnatural* naturalia in the service of lifelikeness. Or should we speak of inventions created to serve scientific truth? Colours were enhanced, bird tails tweaked, symmetries heightened, peculiar characteristics of animals emphasized, and proportions adapted. This is perhaps most evident in the drawings of plants and fungi. Like many other naturalists of the 16th-century, Aldrovandi chose to have plants depicted as *generic* items: his images do not represent the portrait of an individual sunflower, anemone, or clematis, but the plant as representative of a species, in perfect condition, often with both flowers and fruits – even if such an ideal plant could actually never be found in nature. The case of the lily, which he shows as a rather stylized plant with flowers in five different colours, is an extreme example of this visual policy, which was perfectly in accordance with his statement of 1577 quoted above (FIG. 4). There he had argued that the accuracy of the images of Roman emperors on antique coins could not be verified because these individual persons were no longer alive. In contrast, the truthfulness of plant and animal drawings could, as he argued, always be verified since these images could always be compared with those species of plants and animals. For Aldrovandi, one plant or animal – but not one human being – could stand in for another of the same species.

Visual form and function were closely connected. The primary function of Aldrovandi's naturalia drawings was to show the subject as truthfully as possible, assist in its identification (its name in various languages is usually written on the sheet next to the figure itself), and accompany its description in words. Aldrovandi's images served, individually, as substitutes

³³ See Acciarino 2016, 183-186.

for the ‘real thing’ – that is the plant, animal, fungus, stone or mineral they depicted – and, collectively, as a visual database of naturalia that assisted the complicated process of identification. At the same time, they formed a stock of material to be selectively used as model drawings for the printed illustrations in his (often posthumous) publications. The visual format used thus had to satisfy the demands of representational accuracy as well as the practical exigencies of woodblock cutting and printing. While most other aspects of truthful rendering (lines, proportions, volume, shading, positioning on a page, et cetera) could be transferred from drawings to print, colour posed the biggest challenge. Yet, colour was often essential to identification, as Aldrovandi explicitly recognized:

So all the perceptible things that we know in the world are known by this inseparable accident[al property] of colour, which accident is the very certain object of vision and is inseparable from substance, without which information no intrinsic cognition of that substance can be attained. But the philosopher was right when he said that accidentals contribute much to cognition of substance. And among all the others colour is an optimal measure and secure gauge in combination with the other accidentals, that is scent, taste, and touch, to attain the most perfect cognition of compounds, whether they are perfect or imperfect.³⁴

Yet, colour could not be reproduced in print. How sorely it was missed, is evident from the efforts made at vast expense by elite book owners to have their printed naturalia publications by Gessner, Belon, Fuchs, Mattioli, Aldrovandi and others hand-coloured, as accurately as possible.

In none of these respects – the main characteristics of its visual format, artistic manipulations in the service of lifelikeness, the principal functions and the problem of colour – did Aldrovandi’s image collection differ from most of the image collections created in the 16th century by other European naturalists. Similar arrangements, page lay-out, emphasis on clear lines, poses, the lack of context and interaction, the emphasis on generic representations, and the artful ‘twisting’ of exact representation, are typical of the drawings collections *and* the printed illustrations by Mattioli, Gessner, Fuchs, Dodoens, Felix Platter, and the Flemish Libri Picturati, to name but some of the most important examples for the 16th-century. Indeed, the origins of several aspects of these presentational formats can be traced back to the 1530s-40s, or even to the 15th century, as I have discussed elsewhere.³⁵ Aldrovandi fitted into a Europe-wide trend in the truthful scientific depiction of naturalia that was well established by the early 1550s.

The naturalism that characterizes his naturalia drawings was neither new nor particularly Bolognese, therefore. In fact, the ease in incorporating epistemic images of naturalia into Aldrovandi’s collection that originated elsewhere in Italy – whether in the Venetian, Milanese, Tuscan-Medicean or Roman context – was directly connected with this absence of a typically local mode of representation. Though the differences of 16th-century naturalia drawings

³⁴ “*Tutte le cose sensate che conosciamo al mondo le conosciamo per questo accidente inseparabile del colore, il quale è oggetto certissimo del vedere et è accidente inseparabile della sostanza, senza la cui notitia non si può venire alla cognitione intrinseca di quella. Però ben disse il filosofo che gl’ accidenti molti conferiscono alla cognitione della sostanza; et fra tutti gl’ altri il colore è un’ ottima scala et mezzo securissimo congiunto con gl’ altri accidenti, cioè odore, sapore e tatto, per venir in cognitione perfettissima de’ misti o siano perfetti o imperfetti*”, in his letter to Francesco I de’ Medici of 27 September 1577, published by Tosi 1989, 240-241.

³⁵ For a discussion of this European material, see Egmond 2017.

in style and quality can be enormous, they seem to be mainly connected with differences between individual painters who nonetheless worked within the more general format of truth as described here, and not between local or regional truth formats. There are a few clear exceptions to this pattern: 16th-century naturalists and painters who chose a quite different visual format of truthfulness include the botanical expert and painter Gherardo Cibo (1512-1600) in the Marche; the Swiss-South-German Hans Weiditz (1495-1537), who designed the fabulous individualizing plant illustrations for Otto Brunfels' herbal printed in 1532; and the analytical drawings of plants (but *not* animals) by and for the Swiss naturalist Conrad Gessner (1516-1565). Their distinctive format choices need further investigation, but may be connected with different functions of the images from the ones discussed here, and possibly with another public.³⁶

Conclusion

To state that Aldrovandi's collection of naturalia drawings shows no evidence of a specifically Bolognese visual culture of truthfulness nor of a "new naturalism" – whatever his contemporaries may have thought of this – is no more than the reverse of the conclusion that Aldrovandi's image collection was remarkably well attuned to the demands and criteria of scientific representation that were being established internationally between the late 1480s and the mid 16th century. His image collection fitted in perfectly with the types of drawings collections of naturalia that were being created all over Europe, especially in the period c. 1550-c. 1580. That made it all the easier to 'absorb' visual material that originated in other parts of Italy, via gifts or copying. They shared the same criteria and visual formats of truthfulness. While Aldrovandi did not invent new forms of naturalism, none of the findings above detracts from his role as a cultural mediator between visual formats that were widely circulating in the circles of European naturalists and their painters and the local Bolognese circles of professional painters.

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³⁶ These are all discussed further in Egmond 2017.

BIBLIOGRAPHY

- Acciarino D. 2016: "Antipoetica delle grottesche: le *Lettere sulla pittura di Ulisse Aldrovandi*", *Schede Umanistiche. Rivista annuale dell'Archivio Umanistico Rinascimentale Bolognese*, N.S. 30, 169-196.
- Aldrovandi U. 1556: *Le antichità de la città di Roma*, Venezia.
- Alessandrini A., Ceregato A. (a cura di) 2007: *Natura Picta. Ulisse Aldrovandi*, Bologna.
- Azzi Visentini M. 1984: *L'Orto Botanico di Padova e il giardino del Rinascimento*, Milano.
- Belon P. 1551: *L'Histoire naturelle des estranges poissons marins, avec la vraie peinture et description du daulphin, et de plusieurs autres de son espece*, Paris.
- Benkert D. 2019: *Ökonomien botanischen Wissens. Praktiken der Gelehrsamkeit in Basel um 1600*, Basel.
- Brevaglieri S. 2019: *Natural desiderio di sapere. Roma barocca fra vecchi e nuovi mondi*, Rome.
- Brusegan M. (a cura di) 1996: *Leone Tartagliani, Opera nuova nella quale se contiene la natura dil sonno cioe come lhuomo debbe dormire per mantenersi sano con alchuni bellissimi and utilissimi secreti medicinali, Venetia, 1551*, Fermo.
- Burghartz S., Burkart L., Göttler C. (eds.) 2016: *Sites of Mediation: Connected Histories of Places, Processes and Objects in Europe and Beyond, 1450-1650*, Leiden/Boston.
- Cecchi A., Conigliello L., Faietti M. (a cura di) 2014: *Jacopo Ligozzi "pittore universalissimo"* (catalogo della mostra), Livorno.
- Conigliello L. 1991: "Pesci, crostacei e un'iguana per l'imperatore Rodolfo II", *Paragone. Arte* 42, 493-495, 22-29.
- DaCosta Kaufmann T. 2010: *Arcimboldo. Visual Jokes, Natural History and Still-Life Painting*, Chicago and London.
- De Luca M.E., Faietti M. (a cura di) 2014: *Jacopo Ligozzi "Altro Apelle"*, Firenze.
- Dupré S., De Munck B., Thomas W., Vanpaemel G. (eds.) 2016: *Embattled Territory. The Circulation of Knowledge in the Spanish Netherlands*, Ghent.
- Egmond F. 2010: *The World of Carolus Clusius. Natural History in the Making, 1550-1610*, London.
- Egmond F. 2017: *Eye for Detail: Images of Plants and Animals in Art and Science, 1500-1630*, London.
- Egmond F. forthcoming 2022: "Looking beyond the margins of print: visual aquatic natural history in Europe, c. 1500-1620", Leiden/Boston.
- Egmond F., Kusukawa S. 2016: "Circulation of images and graphic practices in Renaissance natural history: the example of Conrad Gessner", *Gesnerus* 73, 29-72.
- Fantuzzi G. 1774: *Memorie della vita di Ulisse Aldrovandi*, Bologna.
- Findlen P. 2005: "The Market and the World. Science, Culture and Collecting in the Venetian Republic", in B. Aikema (a cura di), *Il collezionismo a Venezia e nel Veneto ai tempi della Serenissima*, Venezia, 55-68.
- Finnegan D. 2008: "The Spatial Turn: Geographical Approaches in the History of Science", *Journal of the History of Biology* 41, 369-388.
- Garbari F., Tongiorgi Tomasi L., Tosi A. 2002: *Giardino dei Semplici / Garden of Simples*, Pisa.
- Groom A. 2019: *Exotic Animals in the Art and Culture of the Medici Court in Florence*, Leiden.
- Hochmann M. 2008: "Le collezioni veneziane nel Rinascimento: storia e storiografia", in M. Hochmann, R. Lauber, S. Mason (a cura di), *Il collezionismo d'arte a Venezia. Dalle origini al Cinquecento*, Venezia, 3-39.
- Hochmann M. 2010: "Plinio Scarpelli, pittore di Daniele Barbaro e dei Grimani di Santa Maria Formosa", *Arte Veneta* 67, 43-53.
- Mason P., Pardo Tomás P. 2020: "Bringing it back from Mexico. Eleven paintings of trees, in *I cinque libri delle piante* of Pier'Antonio Michiel (1510-1576)", *Journal of the History of Collections* 32, 2, 225-237.
- Neri G. de' 1600: *Trattato della mutatione dell'aria secondo gl'orti et occasi d'alcune stelle fisse*, Verona.
- Olm G. 1992: *L'Inventario del mondo. Catalogazione della natura e luoghi del sapere nella prima età moderna*, Bologna.
- Olm G. 2010: "Bologna nel secolo XVI: una capitale europea della ricerca naturalistica", in S. Frommel (a cura di), *Crocevia e capitale della migrazione artistica. Forestieri a Bologna e bolognesi nel mondo (secoli XV-XVI)*, Bologna, 61-80.
- Olm G., Simoni F. (a cura di) 2018: *Ulisse Aldrovandi. Libri e immagini di storia naturale nella prima età moderna*, Bologna.

- Olmi G., Tongiorgi Tomasi L. 2018: "Dopo Ulisse Aldrovandi: migrazioni di immagini", in G. Olmi, F. Simoni (a cura di), *Ulisse Aldrovandi. Libri e immagini di storia naturale nella prima età moderna*, Bologna, 9-22.
- Östling J., Sandmo E., Larsson Heidenblad D., Nilsson Hammar A., Nordberg K. 2017: *Circulation of Knowledge. Explorations in the History of Knowledge*, Lund.
- Pinon L. 2002: "Clématite Bleue Contre Poissons Séchés: Sept Lettres Inédites D'Ippolito Salviati À Ulisse Aldrovandi", *Mélanges de l'école française de Rome* 114, 2, 477-492.
- Raj K. 2010: "Introduction: Circulation and locality in early modern science", *British Journal for the History of Science* 43, 513-517.
- Sallent del Colombo E. 2016: "Natural History Illustration between Bologna and Valencia: The Aldrovandi-Pomar Case", *Early Science and Medicine* 21, 182-213.
- Sallent Del Colombo E., J. Pardo-Tomás 2018: "Materials aldrovandiani in Spagna: l'enigmatico caso del *Códice Pomar*", in G. Olmi, F. Simoni (a cura di), *Ulisse Aldrovandi. Libri e immagini di storia naturale nella prima età moderna*, Bologna, 37-48.
- Tosi A. (a cura di) 1989, *Ulisse Aldrovandi e la Toscana. Carteggio e testimonianze documentarie*, Firenze.
- Tosi A. 2005: "Wunderkammer vs Museum? Natural history and collecting during the Renaissance", in M. Beretta (ed.), *From private to public. Natural collections and Museums*, Sagamore Beach, 41-57.
- Tosi A. 2014: "Contrivances of art. The power of imagery in the early modern culture of curiosity", in M. Beretta, M. Conforti (eds), *Fakes. Hoaxes, Counterfeits and Deception in early modern Science*, Sagamore Beach, 153-175.
- Tosi A. 2018: "Acconciare, seccare, dipingere: pratiche di rappresentazione della natura tra le 'spigolature' aldrovandiane", in G. Olmi, F. Simoni (a cura di), *Ulisse Aldrovandi. Libri e immagini di storia naturale nella prima età moderna*, Bologna, 49-58.

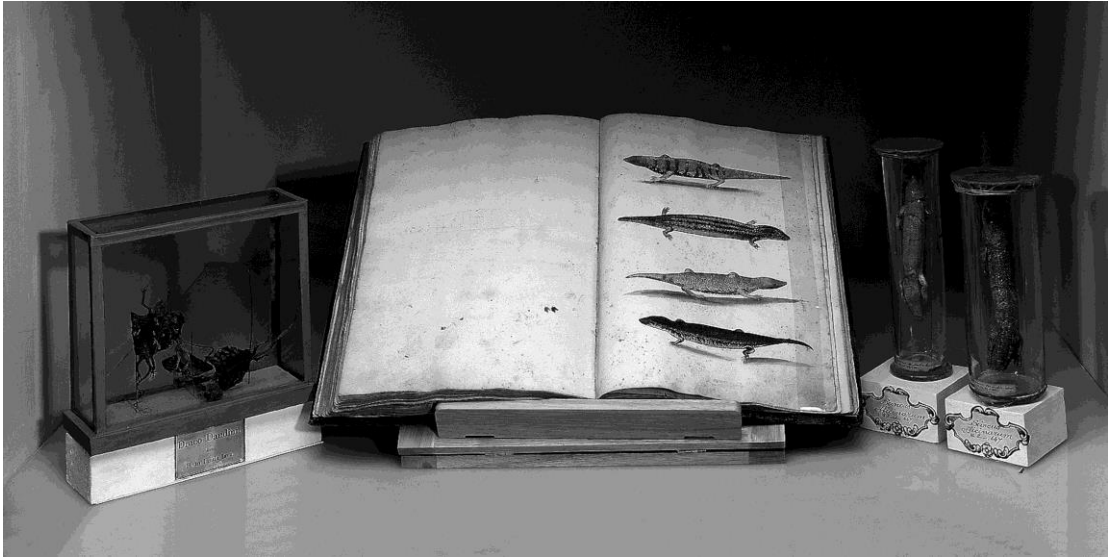


FIG. 1 – Aldrovandi's original naturalia and the images based on them in the Aldrovandi collection, second half 16th century. Bologna, Palazzo Poggi. Photo courtesy Fulvio Simoni, 2014.

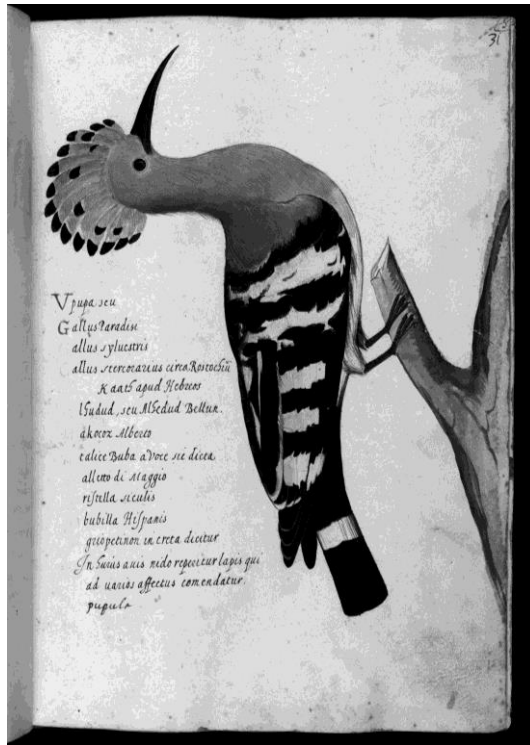


FIG. 2 – Hoopoe. Drawing in Aldrovandi's collection, second half 16th century. Bologna University Library, Tavole 03,031.



FIG. 3 – Exotic tree from America, copied after an image that had arrived via Lisbon. Drawing in Aldrovandi's collection, second half 16th century. Bologna University Library, *Tavole* 10,003.



FIG. 4 – Lily with multi-coloured flowers. Drawing in Aldrovandi's collection, second half 16th century. Bologna University Library, *Tavole* 08,073.

