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Michelle Suzanne Repper	5/1/17
[Student's name typed]	Date

Metaphysics and the Hyper-Real in Ulisse Aldrovandi's Watercolor Drawings

By

Michelle Suzanne Repper

Master of Arts Degree

Art History

_____

Christina Crawford
Advisor

_____

Linda Merrill
Committee Member

_____

Elizabeth Pastan
Committee Member

Accepted:

_____

Lisa A. Tedesco, Ph.D.
Dean of the James T. Laney School of Graduate Studies

_____

Date

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By

Michelle Suzanne Repper
B.A., The College of William & Mary, 2013

Advisor: Christina Crawford, Ph.D., Harvard University, 2016; M.Arch, Harvard Graduate School of Design, 2003

An abstract of
A thesis submitted to the Faculty of the
James T. Laney School of Graduate Studies of Emory University
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Abstract

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By Michelle Suzanne Repper

Sixteenth-century Italian intellectual Ulisse Aldrovandi (1522-1605) was deeply invested in the collection, display, and dissemination of knowledge. He set out to create the most comprehensive and accurate record of natural phenomena to date. In service of this goal, he produced encyclopedias, constructed a unique museum, and commissioned drawings and prints to provide access to the true character of natural phenomena. I will demonstrate that the watercolor drawings Aldrovandi produced for his museum not only mimic but also replace and even surpass their referents in terms of their availability for an Aristotelean metaphysical learning experience; in doing so they become, what I will call, "hyper-real" depictions that can be seen as artistic analogues to Francis Bacon's concept of the novum organum. I deem them hyper-real because they supply more information about their referents than their referents can alone. They reveal the latter's entire ontological capacity in a single, succinct visual experience.

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Introduction

Sixteenth-century Italian intellectual Ulisse Aldrovandi (1522-1605) was deeply invested in the collection, display, and dissemination of knowledge. He set out to create the most comprehensive and accurate record of natural phenomena to date.[1] In service of this goal, he produced encyclopedias, constructed a unique museum, and commissioned drawings and prints to provide access to the true character of natural phenomena. I will demonstrate that the watercolor drawings Aldrovandi produced for his museum not only mimic but also replace and even surpass their referents in terms of their availability for an Aristotelean metaphysical learning experience; in doing so they become, what I will call, "hyper-real" depictions that can be seen as artistic analogues to Francis Bacon's concept of the *novum organum*.[2] I deem them hyper-real because they supply more information about their referents than their referents can alone. They reveal the latter's entire ontological capacity in a single, succinct visual experience.

The complexity of these more than 2,900 watercolor images cannot be fully explicated here, but I will point to a few techniques utilized in this collection that illustrate larger trends in Aldrovandi's project. Specifically, I will discuss the relationship between the size of the painted subject and its referent; the nature of the three-dimensional space evoked; the contextual elements included in the images; and the spectrum of detail within individual compositions. The hyper-realness created using these

[1] This includes, among other things, animals, plants, fish, insects, shells, and fossils. Within the collection, there is also a small but notable selection of fantastical creatures that often have human characteristics. Unsurprisingly, the focus of most investigations into Aldrovandi's work is these mythic creations. However, the majority of the images in the corpus depict content that refer to existing, identifiable flora and fauna, and, as such, they will be the focus of this investigation.

[2] I am speaking of the English philosopher, Francis Bacon (1561-1626) who was a contemporary of Aldrovandi. While it may seem contradictory to suggest that these images are realizations of both Aristotelian and Baconian theories, Aldrovandi's watercolors exhibit an interesting balance that will be explained below.

techniques provided viewers with a focused, assisted vantage point that gave them unprecedented access to the object. Not only do these images and their presentation prove ideal tools for studying and conceptualizing the natural world, they also present a point of transition for the viewer into it, from studying to experiencing, from looking to seeing.

Perspectival Positioning

Even though Aldrovandi commissioned these works, I will refer to them throughout this paper as his drawings. He conceived of this project, ordered the production of these images, organized their presentation, and dictated the nature of their artistic realization. He also encouraged his artists to be as objective as possible when recording natural phenomena.[3] Desiring that they be seen as objects of study rather than images whose sole purpose was to elicit visual pleasure, he insisted that "painting should be the (imitation) (sic) of things as they are… grotesques, [such] as chimeras based only in the naked intellect, are not conformed to nature, and are refuted by this author."[4] Getting his artists to convey visually "how things are" was at the core of his project.

Aldrovandi's "primary object was what he called the 'essence' of nature: its individuality and its animation. 'We must… demand pictures,' Aldrovandi wrote, 'that

[3] While the nature of and potential for "objectivity" in these images is exactly what is at issue here, I would argue that Aldrovandi's desire that his artists remove subjectivity from their creative process makes it less problematic to consider the works as a cohesive group. The artists were not thinking of these drawings as opportunities for individual expression but as components of Aldrovandi's project. The assertion that individual artistic style would necessarily preclude the possibility of seeing this collection as a cohesive goal cannot be ignored. But the themes considered in this paper are ones that show up time and again throughout the collection among works that are definitively made by different artists. Perhaps some of the assertions to come in this paper go too far in their claim for continuity in the larger project, but I believe the larger claims can stand even if certain details prove too specific to individual artistic style.

[4] "La pittura debbe esser [l'imitazione] delle cosec he sono. Laonde le grotesche, per esser chimerice e fondate solo nel nudo intelletto, non essendo conformi alla natura, sono refutate dal sudetto autore." Ulisse Aldrovandi, "Modo di esprimere per la pittura tutte le cose dell'universo mondo" ["Manner of Expressing in Painting All the Things of the Known World"], in *Scritti D'arte del Cinquecento: Tomo I*, ed. Paola Barocchi (Milan: Riccardo Ricciardi Editore, 1979), 923. Translated into English independently by John Calvin Witty.

render the life and spirit,'"[5] or hyper-real images. This does not mean that the artist should render *exactly* what he saw but rather that the artist should convey the essential nature of a thing. Hyper-real images summarize the referent in visual terms, making it the ultimate learning tool.

The complexities of the epistemological, metaphysical, and ontological issues raised by these images will be elaborated on below. However, my central assertion is that Aldrovandi's drawings have to exist simultaneously as sign, referent, and conceptually complete subject in order to function as hyper-real images.[6] To become sign, an image has to be self-referential about its making and its identity as a learning tool. To become referent, the depiction has to be believable as something that could exist in our world. To become conceptually complete, the subject has to convey its identity through a visually altered (though still recognizable) surface. The vacillation of these perceived ontological modes in the mind of the viewer makes an image hyper-real.

Examining the artistic techniques utilized to create the hyper-real is important for understanding Aldrovandi's images. But first it is valuable to consider how Aldrovandi understood and explained his metaphysical investigations and how he positioned himself within the trajectory of encyclopedic history.

Entering the Encyclopedia

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[5] Angela Fischel, "Drawing and the Contemplation of Nature—Natural History Around 1600: The Case of Aldrovandi's Images," in *The Technical Image: A History of Styles in Scientific Imagery,* ed. Horst Bredekamp, Vera Dünkel, and Birgit Schneider (Chicago: The University of Chicago Press, 2015), 176. Quoting Aldrovandi, "Modo di esprimere per la pittura," 925.

[6] Less successful works could fail to achieve hyper-real status. However, hyper-reality is the goal and many images are successful in this—enough to make a legitimate claim about the motivations of the collection as a whole.

Aldrovandi's encyclopedia on birds, *Ornothologiae* (1599), opens with two frontispieces. These etchings by Agostino Carracci serve as a gateway into the text by introducing the tone, content, and philosophical underpinnings of Aldrovandi's project. The title of the encyclopedia is carved onto a marble slab upheld by an architectural framework (fig. 1). Magnates of epistemological inquiry populate this structure, visually and metaphorically supporting the text identified on the slab.

Pliny the Elder, a flanking figure on the far left at the top[7], would have immediately recalled the origins of encyclopedic practice for the viewer as one of the most famous historical figures in early information collection. He was well known for emphasizing the utility of textual over visual information. His historical explications were based on data he mined from previous authorities, though he did value and incorporate his own firsthand accounts. His primary desire was to create a comprehensive source of knowledge that was both practical and accessible.

Like Pliny, Aldrovandi was committed to the accessibility of knowledge. He circulated cheap print encyclopedias to reach wide audiences. In form and practice, these encyclopedias are the branch of his project that most resembled Pliny's. He even used Pliny as a source for history, myth, folklore, visual description, nomenclature, and other information. Aldrovandi was willing to use older, traditional methods of information collection and dissemination in order to standardize knowledge for the populace.

[7] Aldrovandi also included depictions of Pope Clement VIII and Emperor Vespasian who initially funded the project and to whom the text was originally dedicated. Alexander the Great was additionally included. As Aldrovandi enumerated in one of his treatises, Alexander the Great was one of Aristotle's patrons. His inclusion of this figure therefore paralleled Aldrovandi with the Aristotle and encouraged his patrons to align themselves with the powerful, historically significant leader that famously supported the expansion of knowledge.

The visual representations in Aldrovandi's encyclopedias differ from those displayed in his museum. His images were in fact produced in three registers: line drawings, woodblock prints, and watercolors. Artists created line drawings *in situ* to various levels of "completion." They captured their subjects' unique qualities for later elaboration. Most often, these reference drawings would be transformed into watercolor images for display in his museum alongside stuffed and dried specimens (fig. 2). Cost-effective woodblock prints were translated from these watercolors to accompany the text of his encyclopedias.

It is helpful to understand Aldrovandi's project in terms of Pliny's. Utility was key for Aldrovandi in his goal to standardize medicinal information with his textual encyclopedias.[8] However, this was secondary to his desire to convey the essence of natural phenomena. His innovations to achieve that end can be more fruitfully explored via Aristotle, who foundationally supports *Ornothologiae*'s title information on the frontispiece.

While Aldrovandi's reference to Pliny locates his project in encyclopedic history, his reference to Aristotle philosophically orients his project. This orientation is essential for placing his project in the trajectory of metaphysical inquiry. For Aristotle is not only represented on the title page (on the far right in the top half) but additionally on the frontispiece preceding the title page (fig. 3).

This initial frontispiece features colorful plants, animals, and a portrait of Aldrovandi. A scroll of paper lines the base of the portrait bearing a Latin inscription that reads: "This, o Aristotle, is not your portrait but one of Ulisse, of a different face but your

[8] Aldrovandi spent several years as a medical professional and was frustrated with many of the inadequacies of the field.

equal in genius."[9] In conjunction with the title page, this suggests Aldrovandi's respect for previous encyclopedists and philosophers while also asserting his place among them. The specific equation of Aldrovandi with Aristotle, one of the earliest progenitors of metaphysical inquiry, legitimizes Aldrovandi's project but more importantly, invites investigation into the philosophical underpinnings of the latter's inquiries.

Before he became interested in botany, Aldrovandi received a degree in philosophy and became a professor of the subject at the University of Bologna. He had the intellectual means to conceive of Aristotle as a philosophical thinker rather than a mere historical figure in encyclopedic practice. His claim of equal genius to Aristotle suggests that he believed they were doing similar projects. In a treatise explaining his commitments and the stakes of his project, he says that his project is an actualization of Aristotle's desires. Briefly examining Aristotle's "desires" will therefore provide insight into Aldrovandi's motivations and beliefs.

Knowing something for Aristotle means interacting with it firsthand for, "sensations are always true."[10] In the moment of experiencing something, one can know both what the thing is and what it is not. This moment of reckoning through first-hand encounter is the basis for perceiving the essence of a thing. Sight is indispensable in this encounter as the basis for knowledge. As Aristotle suggests in his opening to *Metaphysics*, "above all others the sense of sight… makes us know."[11]

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[9] "Non tua, Aristoteles, haec est sed Ulisses imago, dissimiles vultus, par tamen ingenium." Cited in Tomasi L. Tongiorgi, "Image, Symbol and Word On the Title Pages and Frontispieces of Scientific Books From the Sixteenth and Seventeenth Centuries," *Word & Image* 4, no. 1 (1988): 375, 376.
[10] Aristotle, *The Complete Works of Aristotle*, "On the Soul," ed. Jonathan Barnes, trans. W. D. Ross. (Princeton: Princeton University Press, 1984) Book III (2), 680.
[11] Aristotle, *The Complete Works of Aristotle*, "Metaphysics," ed. Jonathan Barnes, trans. W. D. Ross. (Princeton: Princeton University Press, 1984) Book 1(A), 1552.

Aristotle asserts that, because it inherently alters reality, the artificial could never provide access to natural phenomena. He writes:

> Does… configuration and colour constitute the essence of the various animals and of their several parts?... a dead body has exactly the same configuration as a living one; but for all that is not a man. So also no hand of bronze or wood … can possibly be a hand in more than name. For like a physician in a painting… it will be unable to perform its function… the form of the living being is the soul… [and] without the soul cannot exist… [therefore] it will come within the province of the natural scientist to inform himself concerning the soul… [which] constitutes the essential character of an animal.[12]

Aristotle claims that the material (visual) qualities of a thing alone cannot indicate its nature. Its communicative potential as the thing is voided if it became solely physical (e.g. an artistic representation[13]).

In beginning a comparison of Aldrovandi's position to that of Aristotle, it is important to note their different conceptions of the "essence" of a thing, as it is central to both of their positions. Aristotle makes a clear distinction between a thing's essence (or "substance") and matter. Its essence is based on its final cause, or drive independent of will ("what it is to be"[14] that thing). Matter forms only as a response to, and realization of, this drive, since "it is the presence of the soul that enables matter to constitute the animal nature, much more than it is the presence of matter which so enables the soul, the inquirer into nature is bound to treat of the soul rather than of the matter."[15] The essence of a thing can therefore be accessed through sight because "the form of a natural

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[12] Aristotle, *The Complete Works of Aristotle*, "Parts of Animals," ed. Jonathan Barnes, trans. W. D. Ross. (Princeton: Princeton University Press, 1984) Book I (1), 997.
[13] While Aristotle never directly discusses art proper, I am formulating how it might have functioned for him in his philosophy.
[14] Jonathan Lear, *Aristotle: the desire to understand* (Cambridge: Cambridge University Press, 1988), 122.
[15] Ibid., 998.

organism or artifact gives us what it is to be that thing."[16] Accessing this essence is only important in that it brings about pleasure and contemplation.

For Aristotle, matter is an avenue for understanding a thing but is devoid of meaning in itself. According to Aldrovandi, a thing's "skin" could communicate its essence independent of its physical or animated presence. Understanding something's essence informs one's worldview by teaching sight.

Based on this short explication of Aristotle's position, one might immediately come to the conclusion that Aldrovandi's project is antithetical to Aristotle's. Aristotle deems direct observation of a thing essential for understanding it. However, in keeping with Aristotle, Aldrovandi required that his artists see natural phenomena firsthand, as direct visual observation is necessary to create accurate representations. If possible, Aldrovandi even wanted his artists to obtain visual access to the inner workings of an animal so that they might understand its whole being and be able to render its outer form accurately.[17] He claimed that "it is necessary that [the painter] learns from the excellent anatomists and [observes] with diligence all the sections of the human body, exterior and interior, until he can know the[m]." [18] His artists had to see into the body to properly understand the outside of it and to add scientific objectivity to their work.

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[16] Ibid., 29.

[17] For example, an artist might more accurately represent a bulge on an animal's skin if he looked beneath it and saw the protrusion as a result of the creature's underlying musculature.

[18] "Se occorrerà al pittora a dipingere qualche parte intime dell'uomo overo degli altri animali… bisogna che molto bene li contempla et imita… avendo considerazione se quelle parti… o instromentali come I muscoli, l'officio de' quali è movere tutte le parti degli animali secondo che bisogna con l'aiuto di tendini e ligami. Et acciò il pittore si faccia in ciò eccellentissimo et instruttissimo, bisogna che abbia conversazione con gli anatomici eccellentissimi e vegga con diligenza tutta la sezione del corpo umano, così esteriore come interiore, a fine che possa conoscere di qual figura sia il cuore, il fegato, la milza, gl'intestini, il stomaco, la gola, il cervello, i muscoli."
Aldrovandi, "Modo di esprimere per la pittura," 929.

Examining physical components in terms of their utility provides access to the nature of the thing. When speaking of the duck he suggests "not without cause nature has adorned them with that tonic between the digits of the feet, which serve them as oars in swimming, as they have their primary home in water."[19] Visually examining key components of their bodies meant understanding their place within nature. Their essence is tied to their mode of interacting with the world. It also provides an understanding of the "motivations" of nature, which he describes as a kind of agent, curing the potential malady of a creature too inept to function in its environment. Understanding what undergirds the logic of the natural world would be vastly important for understanding its phenomena.

The physical nature of an encounter with a thing in reality that is so essential for Aristotle is a quality Aldrovandi attempts to elicit through his hyper-real images. The artist uses various techniques to try to create the experience that this *is* the physical referent even though the viewer knows it cannot be. In a sense, this recreates the first-hand experience of the thing, and, furthermore, promotes the importance of physical interaction. This too is tied to a distinctly visual understanding of physicality. For, when looking at the drawings, the viewer does not feel the weight of the object in his hands but its weight on a table or in nature or suspended as if in a vacuum of pure observation. Visual and physical experiences converge. The viewer is present with the sign and referent simultaneously.

These images were bound together in a compendium. While they were placed next to taxidermied animals (potentially aligning them with these preserved, physical

[19] "Né senza causa la natura gli ha ornate d ital tonica fra le dita de' piedi, accioché di questi si possano servire per remi a notare, avendo il suo principal seggio nell'acqua."
Aldrovandi, "Modo di esprimere per la pittura," 928.

remains/presences), their status as *re*presentations could never be fully extricated. Their context in a compendium, collected, categorized, and individuated on the page, would encourage one to engage with these images in a more studious way than an image displayed like any other artwork on a wall. Their format emphasizes their roles as conveyors of information. However, for Aristotle, this kind of physicality could only be read as mediated and could not allow the viewer access to the essence of a thing.

The biggest fundamental and insurmountable distinction between Aldrovandi and Aristotle's philosophies is their differing beliefs in the capacity of art (/artifice), which is necessarily at a remove for providing access to the essence of a thing. Ultimately, one must say that Aristotle could not have approved of Aldrovandi's project as a potential access point for understanding natural things. However, Aldrovandi's belief in the primacy of visual observation for understanding nature must have inspired him to make an equation between himself and the philosopher. Perhaps he believed that Aristotle did not see the potential of art and its utilization of sight in scientific study. Aldrovandi's faith in the capacity of mediating tools for conveying reality aligned with an early modern epistemic shift.

After Aristotle, the suspicion arose that there could be a gap between human perception of reality and reality proper. Early modern philosopher Francis Bacon, a contemporary of Aldrovandi, challenged Aristotle's theories presented in *Organon* with his *Novum Organum*. He suggested that one needs a method to aid in one's perception of reality proper. He wished "to establish degrees of certainty… to reject for the most part the work of the mind that follows upon sense… to open up and lay down a new and certain pathway from the perceptions of the senses themselves to the mind… to do the

whole work of the mind all over again"[20] through method or the *organon*. Aldrovandi finds a middle ground between the commitments of Aristotle and the ideological currents of his time. He claims that vision provides true access to reality if properly attuned and that his artworks could instruct the visually illiterate.

It seems fitting to end this section with an example of Aldrovandi's self-positioning using visual language. The order of the frontispieces of *Ornothologiae* indicates the primacy of visual imagery over textual and encyclopedic tradition: the title page follows the portrait page. Neither plants nor animals are even present in the second frontispiece. The latter emphasizes what made this text possible, not what defines or comprises it.

Aldrovandi's portrait is placed before the other magnates, his status bolstered by the inscription beneath his portrait. A rich, energetic tapestry opens onto a bust view of him, suggesting that his presence underlies any visual expression produced. Animals grasp at this tapestry and plants pierce it. While Aldrovandi's position never seems in danger of destabilization, these plants and animals seem importantly interwoven with this fabric of reality, both created by and independent of Aldrovandi. A grid underlies the plants, the animals, and the fabric, indicating an underlying logic that might be revealed through the study of this visual content. Perhaps the most notable difference between this frontispiece and the following one is its inclusion of color. As opposed to the black and white title page, matching the text to follow, the initial frontispiece is brimming with rich color. This is an essential component for Aldrovandi's project and one that differentiates

[20] Francis Bacon, Graham Rees, and Lisa Jardine, *The Oxford Francis Bacon, Volume XI* (Oxford: Clarendon, 1996), 52-55.

him from many who preceded and followed him. It was color that was perhaps the most dangerous and potentially promising addition to the objective image.

Translating Tradition

The woodcut of a *Rhinocerus* created under Albrecht Dürer's supervision (fig. 4), after his drawing of the subject, was consistently reproduced in encyclopedias for three centuries.[21] Indeed, Aldrovandi's immediate predecessor, Conrad Gressner, copied the image in *Historia animalium* (fig. 5). Following tradition, Aldrovandi also quoted Dürer's image with his *Rhinoceros unicornis* (fig. 6) but notably translated it by adding color. Aldrovandi's exploration of the capacities and limitations of color is exemplified in this appropriation of historical visual rhetoric. Through his transformation of the image, Aldrovandi engages with tropes of encyclopedic production while asserting the stakes and value of his own project.

Based on textual description alone, *Historia animalium*[22] is one of the few images of natural phenomena that Dürer produced without direct observation. Dürer "concocted his image secondhand, from a sketch and a description sent to him by letter."[23] While the artist was committed to representing natural phenomena from first-hand experience, this was a rare occasion when his art was influenced by the market, which altered his normal procedure, for, "he had a good head for business, and large-edition woodcuts were one of

[21] "From the drawing, Dürer produced a woodcut, probably executed in pear wood. The carving itself was most likely done by a specialist artisan… under Dürer's close supervision." David Quammen, "The Boilerplate Rhino: Nature as Concocted, Nature as Found" in *Boilerplate Rhino: Nature in the Eye of the Beholder*, ed. David Quammen (New York: Scribner, 2000), 204.
[22] I will be referring to Dürer's drawing as *Historia animalium* for the sake of simplicity unless otherwise noted.
[23] Quammen, "The Boilerplate Rhino," 204.

the ways he made his money."[24] While Dürer's print is often made out to be more of an exercise in artistic fantasy than it probably is, Aldrovandi's intervention can nonetheless be read as an assertion that color could increase objectivity in an image.[25]

Color has been historically distrusted in both scientific and artistic representational contexts. Dürer himself was praised for his ability to convey visual information without having to resort to color. However, Aldrovandi believed that a controlled use of color could add more information without misdirecting the viewer. His confidence was predicated on the condition that,

> the painter knows all of the [other visual components of a thing] especially well… so that he can paint it with the appropriate colors, and when not knowing, should consult that which he knows, so that he can know their shape, delineation, and description, giving it its true and proper colors.[26]

In this quotation, Aldrovandi implicitly acknowledges the danger of color and its capacity to push an image outside of the realm of objectivity. To avoid this trap the artist has to be intimately familiar with the subject in order to communicate its color faithfully. Aldrovandi believes that this method would avoid color's depictive pitfalls and reap its rewards.

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[24] Ibid., 206.

[25] Many scholars assert that Dürer created a fantastical image of a rhinocerous to titillate viewers rather than to explore his aesthetic relationship with the world. However, as David Quammen points out, Dürer may have been trying to be as accurate as possible in depicting this rhinocerous if he was trying to represent a *Rhinoceros unicornis* rather than the generally assumed *Diceros bicornis*. Regardless, if Aldrovandi perceived Dürer print as the result of second-hand, textual information and as that which had artificial, fantastical visual information unduly added to it, the point still stands that Aldrovandi's addition of color could have been his way of intervening in what he saw as a skewed image. It must also be noted that, as with his evocations of Aristotle and Pliny, recalling Dürer and "improving" upon his image would assert Aldrovandi's artistic talent, the nature of his project, and his superiority over the famous artist. Ibid., 208, 209.

[26] "Bisogna che il pittore molto bene conosca particolarmente tutte le cose sopra dette, o siano inanimate o vegetabili, acciò le possa dipingere con suoi appropriati colori, e non conoscendole, debbe consultar quelli che n'hanno cognizione, acciò possa sapere la lor figura o per delineazione o per la descrizzione, dandoli i suoi proprii e veri colori."
Aldrovandi, "Modo di esprimere per la pittura," 924.

Visual Utility

The potential value of color is most apparent in the study of plants. Unlike taxidermied animals, whose surfaces remained intact after death and transport, plants could not travel and maintain their visual integrity. They could only be dried for museum display, which removed many recognizable qualities, most notably color. Artistic representations of these plants could not only preserve their color but could transcend the limitations of time and space.[27]

The significance of color in Aldrovandi's project, particularly for his plant drawings, is only one of several reasons why this paper focuses on flora representations. As suggested above, a successful hyper-real image had to vacillate between sign, referent, and complete concept in the viewer's perception. A plant image was more likely to achieve this multiplicity because it could capture its referent more convincingly. A still image was unable to indicate the animation and noise of an animal. Plants had the capacity to be static and could be conceptualized as such. Their reduced volume and depth in comparison to animals allowed for greater decontextualization (e.g. shallower spaces); plants more closely matched the flatness of the page and fewer illusionistic techniques were necessary to realistically represent them. Plants could be depicted life-sized on the page, as opposed to "(necessarily) miniaturized animals."[28] The discrepancy in size between an animal and its representation cemented the latter's identity as a sign. If a plant was shown exactly as it would appear in nature, not only in terms of shape, color,

[27] This will be explained below.
[28] Lee Hendrix, "Of Hirsutes and Insects," *Word and Image* 11, no. 4 (1995): 386.
In the case of larger plants like trees, Aldrovandi's artists usually depicted a single, representative branch in order to maintain plants' depth and scale advantages over animals.

and shading but also in terms of scale, it had the potential to become what Lorraine Daston calls an "epistemic image," or a true replacement for the referent.

Plants also had greater visual continuity in historical encyclopedic representations than animals. Representations from Pedanius Dioscorides' *De Materia Medica* (50-70 CE), the most influential botanical text in the history of the field, were copied and reused for more than 1,500 years. This continuity makes Aldrovandi's divergences from tradition both easily identifiable and inherently significant.

There was additionally a unique category of plant representations that had been traditionally isolated from artistic narrative. Medieval herbal images were usually rough, utilitarian sketches created to aid medical specialists in recognizing plants with healing properties. Realism was not a primary concern for these artists as text was the primary communicative medium.

Aldrovandi's images are defined by visual language, which he believed could stand alone as a communicative medium. This eschewal of text seems to be mirrored in his demand that subjects be visually isolated on the page. However, contextual elements are never entirely eradicated though. Guisseppe Olmi, in his "Ulisse Aldrovandi and the Bolognese Painters," claims that these occurrences are an inevitable result of the artistic process. Artists had neither "the capacity [n]or the will to depersonalize their work completely and to act as detached 'photographers' of animals and plants."[29] However, these inclusions do not seem to be mere bi-products of unchecked artistic impulses. Contextual elements are strategically culled, edited, or positioned in these images. Rather than being incidental, these components are woven into the identity of the subjects they

[29] Giuseppe Olmi, "Ulisse Aldrovandi and the Bolognese Painters in the Second Half of the 16th Century," in *Emilian Painting of the 16th and 17th Centuries. A Symposium. Bologna*, ed. Henry A. Million (Baltimore: National Gallery of Art, 1987), 72.

accompanied. Couched in the visual language of medieval herbals, the intentionality and import of these inclusions is exemplified in *Clematidis* (fig. 7) pictured on page 249 of his second volume on plants.

The *Clematidis* is only partially translated from line to watercolor drawing: uncolored gray leaf outlines emerge from three central offshoots of the plant. This sometimes sketched, sometimes schematic quality of the leaves strongly recalls the historical origins of the image. Medieval medical professionals used herbal representations for reference. Their reliance on textual information and their utility was determined by their visual qualities. These images comprise the most characteristic qualities of the plants (i.e. the shapes and patterns of their leaves) so that a specialist could gain a familiarity with their visual characteristics for recognition *in situ*. These elements include flattened and pattern-like representations of leaves, with no or few illusionistic qualities.

The sketched quality of the *Clematidis* recalls this visual language. However, the finish of the *Clematidis* is not uniform, as it would be in an herbal. This spectrum of completion serves as a visual metaphor for Aldrovandi's interest in but ultimate divergence from traditional images. The variable detailing draws attention to the edited aspect of the image and its identity as a tool of instruction rather than one of mere pleasure or reference. It indicates enough leaves and flowers to suggest the whole without having to needlessly rehearse these elements more than necessary. Further iterations of these components do not bring the viewer any closer to an understanding of the object. The spectrum of completion also creates different points of compositional emphasis that

might have been lost with uniform detailing. Potentially distracting leaves are removed to reveal the primary focus of the image: the snake.

The import of the snake in *Clematidis* is clarified with the discovery that its leaf can serve as anti-venom for the reptile's bite. Flora representations in medieval herbals are sometimes accompanied by, for example, the thing whose poison the plant could neutralize (figs. 8, 9). With an injury like a snakebite, time would be of the essence in order for the victim to be saved. In the field, a doctor would need to be able to quickly recognize the snake and visually associate it with the remedy. In such an image, therefore, the plant, its utility, and the purpose of its illustration are conceptually united by such contextual components. Following the medieval herbal tradition, the identity of the *Clematidis* is defined by and embodied in the external component of the snake.

Its twisting form enlivens the otherwise relatively inert plant that, alone, might have been too visually flat to be believable or compelling. As the snake slithers down its stem, it completes the plant's form. The shoot stops at the snake's head and continues at its tail. The conceptual integrality of the snake to the identity of the plant is concretized in this image. The artist's job is to unveil a subject's identity to the viewer, and in this case, the plant's essence is located in the healing properties of its leaves.

The Ascent of the Hyper-Real

Being in Paint

As asserted above, Aldrovandi's watercolors function as hyper-real when vacillating between identification as sign, referent, and conceptually complete subject. Some of the many artistic techniques Aldrovandi uses to create this effect will be

identified below, but it is necessary first to examine the terms and import of these ontological possibilities.

To understand these works as signs they must be recognized as physical, self-referential learning tools. The pages are bound in compendiums rather than displayed individually, which could have equated them with the adjacent taxidermied animals. However, the works exhibit a spectrum of realism so that their mediation could not be forgotten. In images like the *Ara macao* (fig. 10), the edge of the page is reformatted to fit the creature's unwieldy shape. These transgressions of the edge of the page are reminders of its parameters. Shadows and overlapping forms assert the position of a subject not only in theoretical space but also on the parallel, physical space of the page, so that it seems that the page itself is the table on which the referent lies. This allows the viewer to see through the artist's eyes, to access the observational capacity of the experts, and to envision his own physical interaction with the referent.

The capacity for plant images to become physical referents resulted from an important ideological shift in this period. In Europe in the 16th and early 17th centuries, sight became essential for the possibility of what Lorraine Daston calls the "epistemic image." She claims a "new form of empiricism that emphasized… close and sustained observation of particulars [arose]… elevat[ing] the importance of seeing as a way of knowing nature."[30] This new emphasis on sight and its fundamental connection with knowing developed concurrently with the belief that physicality is an essential quality of

[30] Lorraine Daston, "Epistemic Images," in *Vision and Its Instruments: Art, Science, and Technology in Early Modern Europe*, ed. Alina Alexandra Payne (University Park, Pennsylvania: Pennsylvania State University Press, 2015), 17.

man's relationship to nature.[31] Referencing projects like Aldrovandi's, Daston describes the result of this "relationship between the eye of the body and the eye of the mind in early modern vision"[32] as a "titration," materialized in representations "more real than any one individual specimen… the real… extracted from the tangle of the merely visible."[33] She explains her point in her article "Epistemic Images" by comparing two images of a mandrake, one produced in the fifteenth-century (fig. 11) and the other in the fifteenth (fig. 12). With these she illustrates an ideological transition through a visual one. During this century people began to believe in the potential of the physical form as a source of objective truth outside of subjective intervention. But although there was an interest in the possibilities of the "view from nowhere,"[34] Daston claims that it could never be achieved. She defines the "epistemic images" that resulted from this interest as those which

> aspired to more… than just representations of nature; they *are* nature—or rather nature selected, distilled, refined, and perfected. Even when epistemic images look exactly like what the eye of the body sees, they are nonetheless creations of the mind's eye… earn[ing] its name by translating abstract epistemological priorities into concrete pictures.

I wish to go past Daston's epistemic image and suggest that Aldrovandi's works are hyper-real. If one claims, like Aldrovandi, that the visible qualities of a natural phenomenon (the skin as I call it) can reveal and even define its ontological capacity, and if an image of it can show more visible qualities at once than its referent, then it *must* in fact surpass the referent in terms of providing a direct access to the thing's essence. Therefore because these images are more capable of serving as objects of learning, they

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[31] These ideas are not new in that they had never been conceived of before but were in relation to the previous epistemic mindset.
[32] Daston, "Epistemic Images," 17.
[33] Ibid., 32.
[34] Ibid., 16.

have a greater ontological capacity than their referents, which makes them more than just stand-ins for the real thing.

Multiple qualities of Aldrovandi's images create a conceptually complete subject that encapsulates the essence of the referent. Images transcend the limitations of time by showing various stages of growth of a plant (fig. 13). The viewer did not have to wait for seasonal shifts in order to see a plant's annual life cycle. The subjects transcend space by being collected in compendiums. It was the artists that traveled to distant lands so that the viewer did not have to. Subjects are also often shown in isolation, supplying concise perspectives so that viewers could easily focus on and absorb its features. Drawings also often supply multiple vantage points in a single depiction so that one could experience all of its visual 3-dimensional qualities at once.

Using these and other techniques, Aldrovandi codifies an intuitive experience of a thing and re-presents it to the viewer in more comprehensible terms. These images allow the viewer to see through an expert's eye and train his own eyes to be able to process information on a more complex level in the future.

Three images will now be considered that exemplify the hyper-real.

Suspended Flat

A depiction of a *Caryofillata montana* (fig. 14) fills page 70 of Aldrovandi's 6th volume of *Plants Flowers Fruit.* The image is exemplary for its shift in conceptual space as though suspended isolation to physical space on a flat table that metaphorically becomes the flat page. This orients the page as horizontal rather than vertical (differentiating it from a hung painting). Aldrovandi is able to achieve this through the

placement, proximity, and shading of its the leaves. These techniques make it possible for the viewer to experience himself as the expert studying the referent first-hand. These vacillations in realism promote close looking and engagement so as not to miss any experiential and educational components. This occurs as the viewer becomes aware of the kind of engagement he is engaged in as he actively studies these works. This experience could be paralleled with the previous one of the artist as he rendered the piece. As the viewer sees his role and his task as more and more aligned with that of the expert, he might experience the actual referent through the artist's eyes. This potential is particularly plausible because, as Daston points out, sight and knowing were so interconnected in this time and the Baconian epistemic shift suggests that mediation is essential for access to anything, including the physical. The *Caryofillata Montana* features many of the components of a typical Aldrovandi drawing. It displays multiple stages of the plant's life, differing vantage points, a sense of completeness, and appears to be the same size as its referent.

The subject of this image is particularly ideal for study due to its lack of context. Its illusion extends only as far as its outline; outside of this the page is a flat and vacuous void. The *Caryofillata montana* is not placed within a visual narrative and it casts no shadows, yet a sense of three-dimensional space lingers. Shading, overlapping forms, positioning, color, and variation in detail create a kind of internal space that is totally dependent on the plant's own form. It provokes close looking and study from a viewer perhaps unconsciously unsettled or at least unsure of how this isolated subject can seem to exist in the our physical world while staunchly maintaining its position on the flat

page. This invokes a new kind of real, a hyper-reality existing outside of normal physical, spatial restraints.

The plant has seven main offshoots from the root; four of these feature only leaves while the other three flower at their ends. The depiction is centrally placed, nearly symmetrical, and balanced spatially. The collection of flowers is the most non-naturalistic portion of the drawing. These remind the viewer that this is indeed a painting and not an actual plant. Like many other Aldrovandi images, all of the life stages of the plant are shown (in this case, by the flowers). This is represented in the work with a vertical progression that matches the increased age of the flowers. The lowest one (on the right side) is the youngest. Though it might seem as though it could be the same size as the one on the left side, this profile view suggests it has just emerged from the shoot. The youngest flower is the most non-naturalistic of the three and the least available to the viewer. The matured flower, on the other hand, is completely open to the viewer. It represents most clearly the recognizable characteristics of the plant. However, this mature flower is completely unconvincing with identical semi-circular petals without edge variation or shading. Its stem shoots upward between two of the petals, bisecting the flower into symmetrical parts. The stem then ends ends with identical green triangles that emerge between each two-petal gap. The mature plant is still more realistic than the young flower, which offers fewer details and makes little spatial sense. The oldest component, the seed head, is rendered with thin, equidistant non-overlapping strokes that give it a uniform, patterned look. Even so, it is the most realistic of the three. It shows a much more deliberate hand and a greater desire to record it as it would have been seen. It turns away from the viewer since it is closest to death and must commit its energy

outward, toward the future success of the plant. It shows the end of the flowering cycle and seeds detach from it to reincarnate the now conceptually timeless plant.

The flowers provide a metaphorical exit point for the eye. The smallest plant shoots outward from its bud. The mature plant exists between illusion and artifice, providing access for the viewer and external elements, such as bees to pollinate it. Finally, the seed head suggests the death of the plant as its fibers fade into the color of the parchment behind it. This is similar to the fibers forming on the root that fade into the color behind them and grow from the page itself. The cycle of life in this image is carefully organized according to the logic of the depiction and the parameters of the page. The root leads one in from the surface of the parchment, and the seed head leads one out, realizing the cycle of life.

The root placement would not have been able to physically support the upward growth of this plant. It is curved to the right and, as a result, is ideally positioning on the page for study for learning and for recognition. It is important in its own right. It frames the identifying information with the suggestion that the root is also key to the plants identity and identification. Importantly, the *Caryofillata montana* is a plant in the same genus as cloves, and "the root has a clove-like taste… when cloves are not available the root is used as a substitute for them."[35] Therefore, the inclusion of the root, as a notable, recognizable component of the plant makes sense.

The drawing shows most of the smaller leaves of this plant with complete outlines, positioned so that they could be easily identified. As has been noted, like

[35] Johannes Seidemann, *World Spice Plants: Economic Usage, Botany, Taxonomy* (European Union: Springer, 2005) 165, 166.

medieval herbals, this was a traditional technique (fig. 15, 16). Not only does this clearly show the leaf shape but also leaf distribution.

The small leaves differ in size and shape from the large leaves on the outer offshoots of the plant. There are two distinct types of leaves present on the plant: those that are on the stems of the flowers, as well as larger, more detailed leaves growing from the outer shoots. The shading and vein details of the latter have been added to increase the realism, but this does not add much more data for recognition. This shows a departure from medieval herbal visual language.

The indeterminacy of the space is most exemplified in the larger leaves, which are symmetrical in number and positioning. The top large leaf on the right side is shown with a complete, uninterrupted outline and uniform color. The leaf below it is significantly darker. This initially seems to indicate a significant distance between them. However, based on coloration of the leaves on the left side of the stem, distinctions in coloration may simply indicate the opposing side of a leaf. The shadow on the lower leaf suggests a distance between these leaves of perhaps ¾ of an inch, yet they seem so much closer.

On the left side of the stem, the large leaves are folded over, their two sides closer than they should be considering their relaxed plications. It seems like they are being pressed down by a piece of glass lying on top of them. The shoots culminating in these large leaves do not seem as though they could support themselves based on their thickness and the position of the root. These qualities indicate that the plant is arranged for ideal study and revelation.

The multiple kinds of flatness displayed in the *Caryofillata Montana* draw attention to the physicality of the page and provide access to the conceptual physical

referent as the specialist would have seen it. Vision as essential to the skin of nature and therefore its reality are essential for these teaching tools to succeed. This flatness is present in three registers: the flowers of the plant are flat against the page due to their non-realistic rendering, unconvincing shadows, and pattern-like qualities; there are indeterminate distances and confusing colors in the interaction of the large leaves on the right; and the large leaves on the left that seem to have been artificially flattened. These different kinds of flatness have different implications for value and purpose of this image. Firstly, the unrealistic flowers and their denial of illusionism are aligned with the flatness of the page. This reminds the viewer of the constructed nature of the drawing. Second, the total isolation of the plant on the page gives it an artificial space of its own. This makes it a sole and timeless object of study. The qualities of the large leaves on the left however, suggest that the subject is on a table being studied as the weight of visual observation literally presses it down. This provides physical and visual access to it as an object of study and places the viewer in the perspective of one whose job is to intimately know these things. Third, the entire outline of the large top leaf on the right is visible. This recalls medieval herbals and additionally allows the viewer total access to the plant and its distinctive qualities.

Laid Upright

The *Citrium* (fig. 17) utilizes multiple techniques to create a hyper-real subject, but the most notable one is the inclusion of multiple shadows. One can see the fruit from multiple vantage points at once. This holistic view is not dependent on a subjective, conditional, and potentially flawed perspective in one's encounter with it. These shadows

allow one to see how the fruit *could* be were it independent of the limits of our laws of space and time and our biased, potentially amateurish perspectives. The nuances and ramifications of this are worth drawing out.

The pear shaped fruit occupies the top ¾ of the page, almost touching the top and left edges. The illustrated portion of the page is contrasted with the vacant bottom ¼ and its less than imposing caption that does not balance the image; it is too far away from the bottom edge to mirror the dense population of the top left corner. The inscription is small and almost illegible in contrast with the looming, vibrant, and imposing illustration. The placement of the text is more dependent on its relation to the fruit than vice versa. It identifies the fruit as simply "another *Citrium*" ("*Citrium pyriforme*") and then provides only the weight and circumference of the fruit. This barren technical description is contrasted with the wealth of information provided above it. The capacity of text as opposed to images to indicate information is shown to fall unacceptably short as an informative and educational tool.

The body of the fruit itself is placed in the center. It is slightly asymmetrical with greater mass on its left side. A truncated bright green stem extends from the top of the ovular form, codifying the vertical axis of the page. To compensate for the fact that the fruit has more mass on the left side, the stem is placed slightly right of center on the apex of the fruit. The form is visually balanced because the upper half of the stem curves to the left. One leaf extends out of the right side and a thinner branch with three leaves out of the left. One will note that the branch is pruned of two leaves that might have obstructed one's full view of the other three. The stem extending out of the fruit is also cut so as not to interrupt the space occupied by the leaves. Because of this, the outlines of all of the

leaves are clearly visible. Where the stem could have interrupted the uppermost leaf, it is cut obliquely to just touch and therefore emphasize its edge (this significance is compounded by its repetition with its accompanying shadow). As though directing the viewer's attention, the stem seems to signal the equal import of the leaves and fruit to this plants identity.

The fruit's surface is irregular and uneven, constructed entirely of converging globular forms. Small circles and dots in varying shades of brown cover the exocarp (the outermost layer of the rind), which indicates oil filled pits that contain the oil glands of a citrus fruit. Their shade of brown most often matches that of the pattern of shadows that define the bumps on the surface of the fruit. The lighting on the body of the fruit itself is consistent and clearly indicates a single light source just in front and to the right of the fruit.

However, all other indicators of light locating the form in space are inconsistent and at times hard to parse. Based on the shading, it is difficult to ascertain which leaves are facing front and which are facing back. The lighter portions of the leaves do not indicate a consistent light source, and all of the central veins of the leaves are painted a bright, "fully lit" green, adding to the confusion. After close study, it is clear that the two outermost forms show the back of the leaves and the innermost, their front.

The shadows cast from the fruit become more nonsensical the longer one examines them. There are two distinct shadows cast that do not match: that cast by the body of the fruit and that cast by the stem, branch, and leaves. One might suggest that there are two light sources, but this cannot be the case as the shading on the fruit itself is consistent and the fruit and non-fruit components do not cast simultaneous shadows for

two different light sources but two unique, unaffiliated shadows. That cast by the fruit itself is the first of the two that catches one's eye. More notable than that of the foliage due to its larger size, its greater independence from the form, its more intense contrast in color, and the strong perpendicular it creates with the central, horizontal axis of the page and therefore the fruit, this shadow both defines the space and grounds the object. It gives the object a weightiness that it would otherwise be lacking.

This main shadow is fudged to look as though it matches the light shining on the fruit but if this were the case, it would push back deeper into the space. The light on the fruit comes at a 45 degree angle to the right of the viewer. However, the shadow indicates that it is coming from a 90 degree angle to the right of the viewer, as though from the right edge of the page. This creates a shallower space. The intensity and resoluteness of this shadow emphasizes the "thing-ness" of the fruit. The shadow is not a mere byproduct of the fruit's presence in the world, but an assertion of its reality on the page.

While the left side of the fruit does seem tied to a physical space (it is "heavier": it has more mass and is defined by shadow), the line delineating the right side cuts it very sharply out of its reality and pastes it firmly on the page. In addition, the fruit is shown from multiple vantage points; the base of the fruit is made visible though it *should* be underneath it. Once again, these components visually and conceptually vacillate for the viewer by blurring the physical and the visual, the image and the referent.

The complexities of the shadows in *Citrium* create a version of the fruit that provides more immediate information about its physical qualities than its physical referent could. It can be seen multiply from this perspective making a physical encounter with the thing unnecessary to understand all of its physical qualities. In addition, the

depiction provokes a kind of looking focused on study rather than pleasure. Rather than emphasizing the artist's individual skill in creating a realistic image, this image again teaches the viewer how to see by understanding the subject through an expert's eyes.

From Inside, Out

The inscription for the *Averrhoa bilimbi* (fig. 18) reads: "*Cucumis arboreus/ Hulxio Hispanis/ Pepina fructui Hispanis/ dicto similis.*" This translates roughly as: "cucumber tree/ Spanish July/ like the Pepino fruit in Spanish." These phrases indicate its native location, the time the plant is in bloom, the time of its rendering, and a similar fruit in its native context. This inscription, as opposed to the others examined here, points outward. The contextual information is much in keeping with traditional encyclopedic textual information, but the image of the *Cucumis arboreus*, specifically the *Averrhoa Bilimbi*, provides a rich world of information not at all conveyed by its inscription.

In order for this rendering to correlate in size with the original plant on the page, a branch has been cut from the larger plant. This maintains the integrity of a faithful depiction because all of its identificatory elements are represented and the cut branch can read as the trunk. The branch's "rings" turned outwards toward the viewer, its thickness in relation to the rest of the branches, and its vertical positioning mirror the function and form of a trunk.

This centrally positioned plant indicates its largeness by filling a large portion of the page in terms of its proximity to the edges and its density. The commitment to creating the latter is not only indicated by the intense overlapping of the leaves but also in artistic space-filling techniques. For example, a green cucumber is placed vertically

upside-down in the center of the image. Where there might have been a gap in the leaves and branches, this cucumber is perfectly fitted to fill the space. Its purpose in the image is to improve the visual logic and to provide a faithful account of its referent.

The overlapping of the leaves, the presence of butterflies, and the specific reference to the time of year that the plant flowers, all contribute to a narrative that the artist observed this phenomenon first-hand. This encourages a different kind of looking, one that provides a transition from looking down at a sterile isolated object on the table to looking up and out at the world.

Three butterflies and a bee pollinate and feed on the tree. This is an uncommon instance in Aldrovandi's collection of multiple species interacting in a single image and therefore deserves close study. These insects might seem merely decorative: unlike some instances in Aldrovandi's images where the bodies of insects are shown from above to exhibit the uninterrupted outline of their wings, these butterflies are shown in profile. All of these insects are interacting with the plant, rather than exclusively with the page. This is how one might encounter the plant in nature, outside of the vacuum of the page. In fact, this tree is a larval host plant. Butterflies specifically seek it out in order to reproduce. As a result, it is not be uncommon to see these insects surrounding it *in situ*. The image exhibits that these elements are as much a part of the plant as its leaves. It is not only that they might be seen with the plant but that they generate its very possibility by pollinating it. It is a symbiotic relationship that is essential for the survival of both.

Indeed, both bees and butterflies can pollinate the *Bilimbi*. There are two types of *Bilimbi*: self-fertile and heterostylic. A self-fertile tree is one that can pollinate itself using only the wind to transfer pollen from its stamen to its own stigma. The pollination

of self-fertile trees can be helped with butterflies and bees but need not be. Heterostylic plants on the other hand, need help pollinating. This is a rare kind of plant that produces three non-compatible types of flower that cannot pollinate one another and have different stamen lengths. This plant's inability to self-pollinate makes bees and butterflies necessary for its survival. The likelihood of this *Bilimbi* being of the heterostylic variety in this image is therefore high due to the presence of these insects and the depiction of differing stamen lengths. These inclusions are intrinsic to the plant's identity and allow for more precise identification.

With greater subtlety than the gourds depicted on the *Cucumis sativus* (fig. 13), all of the life stages of the plant are alluded to here as the eye moves up the form. One encounters the plant's whole life cycle from death to maturity to regeneration. The cut stem suggests its death with the removal of its life source. The fruit of the plant indicates its mature state. The flowers at the top of the plant, their close proximity to the insects, and the beeline of this insect to pollinate the plant suggest its potential rebirth. It is clear that the insects are connected to the regenerative capacity of the plant.

The colorful insects and their interaction with the plant emphasize regeneration as its most crucial life stage. While all of the flowers within the form are frontally positioned, the flowers on its perimeter are shown almost exclusively in profile. This provides greater visual access to their stamens and also suggests their receptivity to external stimuli. In response, a rich array of insects accompany it. As suggested above, the stamens differ in size in these flowers. The stamens of those in this center of the right side of the plant are not visible in a profile view. That of the flower on the lower left corner of the flower is short but visible and is colored differently from the other stamen

as if to highlight its distinction from them. And the top flower, for which the bee is heading, has the longest, most prominent stamen of all. Attention is paid to the stamens as an essential component of the plant's procreation and of its identification. Clusius identified and defined "heterostylic plants" in 1583[36], so it is conceivable that this artist knew the potential import of stamen. More likely, the artist simply had excellent observational and rendering skills. Still, this bit of visual information is extremely informative, even if it is not immediately apparent.

The *Berberis americanus* (fig. 19) is an image that is, in some ways, an intensified version of the *Bilimbi*. It reads less like it has been plucked from its natural setting. It has more schematic regularity and symmetry, more stylization, and a lower density of foliage than the *Bilimbi*. It is more like an artistic painting with visually appealing elements that happens to be showing the notable qualities of the plant. The strange inclusion of two identical inscriptions on either side of the plant at the bottom of the page suggests an emphasis on visual balance rather than informative content. These inscriptions and the work's schematic qualities seem to suggest a reliance on text rather than an ability to relay information independently. The butterfly in this image seems to initially support this reading. Unlike the *Bilimbi* image, this butterfly is not interacting with the plant but is simply adjacent to it. It is lying flat on the page, ready for independent study.

In investigating this seemingly simple image more closely, one discovers other creatures in the branches of the plant, hiding in the systematic logic of the leaves. After the butterfly, the second most apparent creature is the bird in the bottom left corner of the

[36] N. O. Anderson and B. E. Leidl, "Reproductive Barriers: Idenfication, Uses, & Circumvention," *Plant Breeding Reviews* 11, ed. Jules Janick, 23.

plant. None of its features are obscured, and its tail stands out clearly as it fills a potential void in the composition. The majority of its body is however surrounded by plant matter to the point that the eye might miss it. The curve of its neck also matches the curve of the leaves that surround it. Next, among the *Bilimbi*'s leaves, a small squirrel is visible in the top left corner of the image. A dull gray, its body fades into the background since it is surrounded by loud, bright greens and purples. It also matches the curve of the branch on which it balances as it reaches up to nibble on some berries. Perhaps the most difficult animal to spot is the bird to the right of the trunk and slightly off center in the image. While it is the most active creature in the image, flying through the foliage, its colors match the leaves around it and its spread wings mimic their shape. The leaf that nearly bisects it horizontally could be mistakenly read as its tale, though closer inspection reveals that the bird's tail does not splay out but extends straight behind it. This interplay between the forms that comprise the tree and the creatures that populate it train the viewer to unpack the complex tapestry of nature. They compel the viewer to investigate images more closely and reward him with educational surprises. The viewing experience is one of delight and increases rather than satiates curiosity as the viewer engages with the image.

The inclusion of the occasional contextual element, though seemingly contradictory to Aldrovandi's ideals, therefore serve the purpose of teaching viewers the import of close looking and its potential as a revelatory process. Finally, the physicality of these images and the equation of them with their referents allowed viewers to carry over their newly honed skills of focused looking into the real world, using them as points of transition.

The World Skinned

In keeping with Aristotle's philosophy, Aldrovandi believed in the import of first-hand encounters with natural phenomena in order to understand and convey their essence. He also similarly believed that there was a possibility for error in perceiving a thing's essence via a physical encounter. Aldrovandi's solution for this possible error was to introduce mediation in order to train those more likely to perceive nature incorrectly—this is where Baconian thought aligned with his practice. Aristotle ultimately believed there was no break between one's perception of reality and reality proper. However, the anxiety regarding this potential arose, as noted, in Aldrovandi's time. Bacon's belief that human perception *necessarily* needed mediation to achieve understanding may go a little to far for Aldrovandi. The latter believed that understanding could be accessed best by artists and scientists who were trained to see properly. However, he thought that the skill of being able to perceive the world accurately through first-hand interaction could be taught. As such, Aldrovandi found a happy medium between the two in his work.

These philosophical undercurrents find expression in works such as the *Caryofillata montana*, the *Citrus medica/ Citrum,* the *Averrhoa bilimbi*, and the *Berberis americanus*. The works have been presented in this order for this argument to suggest a progression or ascension from the study of visual aids to one's potential interaction with the world. The *Caryofillata* is shown flat to convey its status as a study tool in the book and on the table of the artist. The page is horizontal as one imagines physically looking down at the real specimen. The *Citrium* pushes one's sight up a little. The fruit is placed upright on a table, and indicates a greater 3-dimensional space. By being completely available (existing in several physical states simultaneously with its multiple shadows

and its impossible positioning), it suggests that sight can be more valuable than touch can in giving one access to the world. One must note, that the page also vacillates between verticality and horizontality as contradictory shadows indicate that fruit stands while the leaves lie on a flat surface. The *Averrhoa bilimbi* and the *Berberis americanus* serve as the final step to educate someone in seeing properly. The work is fully vertical and the subjects are represented in a less sterile environment. Contextual elements are included, and the subjects' suspension in space equates them less with the page as a space and more as subjects in limbo, clearly plucked from their natural context and suspended in this impossible anti-space. They are isolated, but because of the contextual elements included, their true (potential) location in the world is never forgotten. The latter are meant to be the transition point for the viewer, as he now looks straight ahead, the journey from studying artifice to experiencing reality complete.

When a viewer encountered one of Aldrovandi's watercolor drawings in the museum, its identity as a learning tool was bound with it between the covers of the compendium. The hyper-real experience was dependent on this physical interaction with an acknowledged mediator. Crucially, these pages are animal skin themselves. As opposed to the schematic woodcut images printed on paper in the circulating encyclopedias, these watercolors are drawn on parchment.

Parchment smells. It feels like skin. One can see its animal's pores, hair follicles, scarring, and vein impressions.[37] Whereas text elicits engagement with distant ideas rather than a visual engagement with the proximate page, and a narrative based image invites one to see through rather than at the image, Aldrovandi's drawings require a

[37] Sarah Kay, "Legible skins: Animals and the Ethics of Medieval Reading," *Postmedieval 2*(1), (2011), 13-14.

sustained visual engagement with the surface of the parchment, that is, the surface of the skin.

Sustained looking at the physical surface of an animal mirrors the viewing process encouraged by the text and emphasized the direct connection between the visible and the real. Aldrovandi provided his viewers with the skins of nature removed from the life-pulse and placed on the table, the horizontal page. He hoped to train viewers to visually understand these skins as an entry point into comprehending nature.

Ulisse Aldrovandi's watercolor plant drawings were created and collected to give the viewer greater insight into the world and an increased capacity to understand it. The objectivity he advocated for in his images can be identified more accurately as concision. He wanted his artists to cut, add, and alter information as needed so that the viewer might see unimpeded. This required representations that mirror yet altered reality without distorting it. The resulting hyper-real images gave the viewer access to the essence of natural phenomena and the tools to gain visual entry into the real world.

Figures

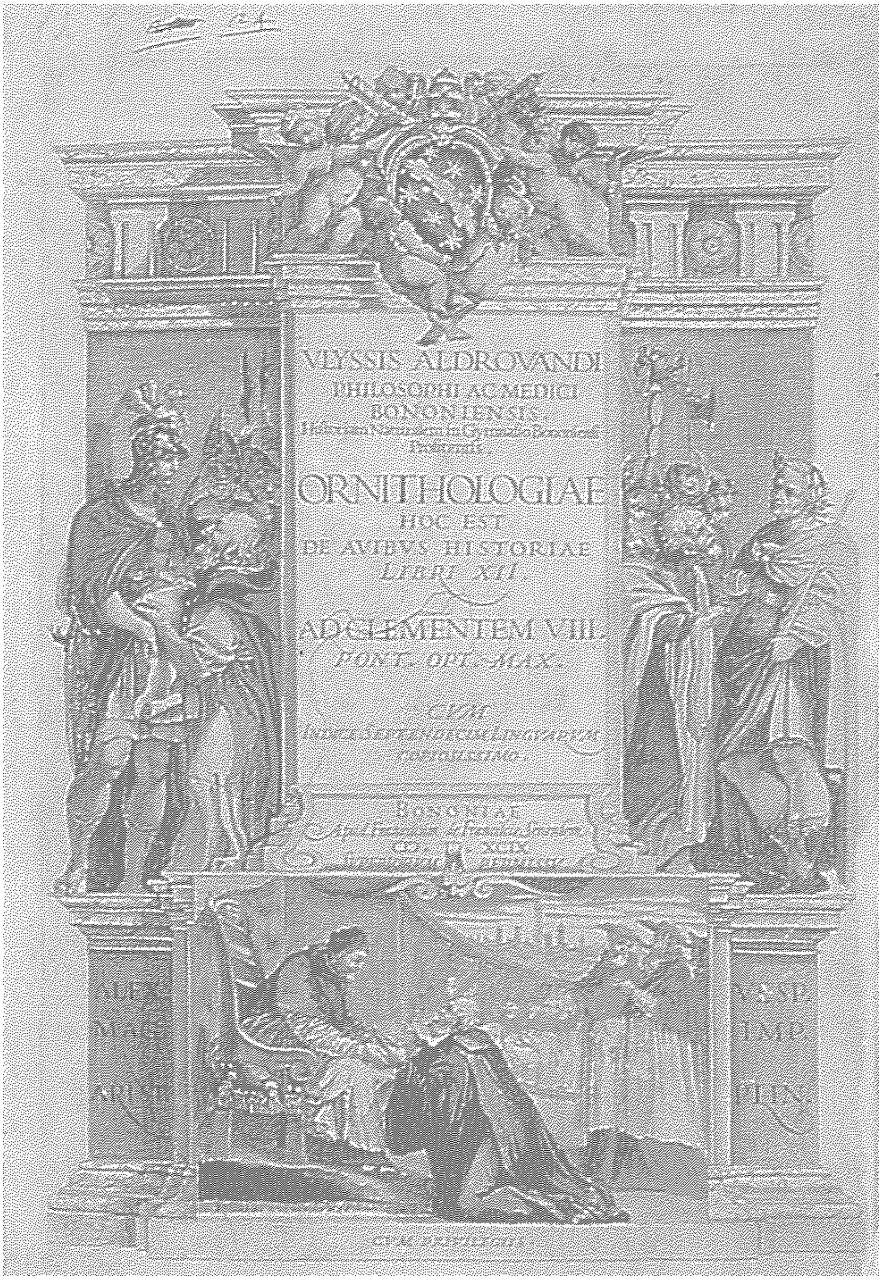

Figure 1. Agostino Carracci, Frontispiece featuring Pliny and Aristotle among others, *Ornothologiae*, 1599

Figure 2. View of Aldrovandi's museum

Figure 3. Agostino Carracci, Frontispiece featuring portrait of Ulisse Aldrovandi, *Ornothologiae*, Engraving, 1599

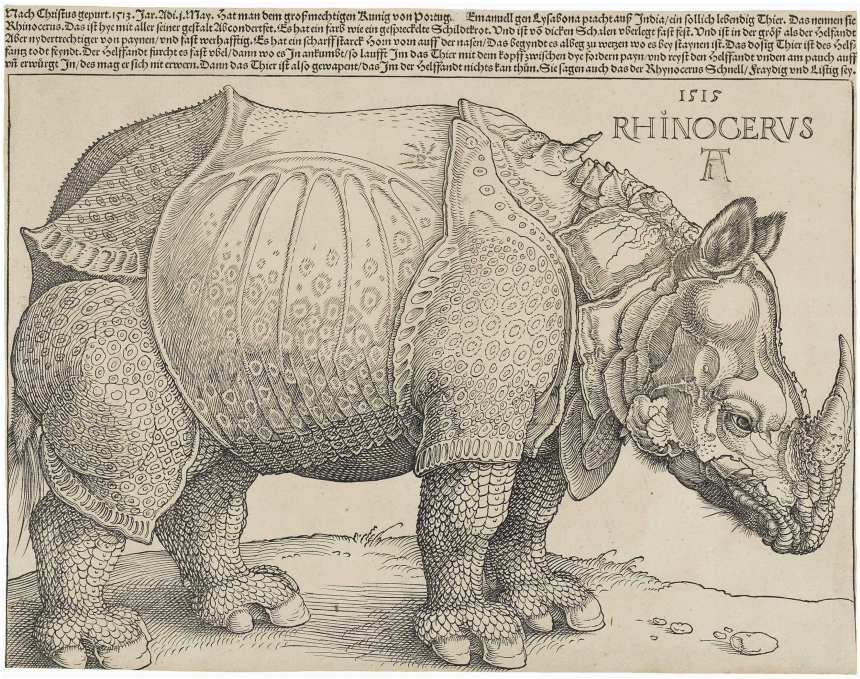

Figure 4. Albrecht Dürer, *Rhinocerus*, Woodcut, 1515, 9.3”x11.7”

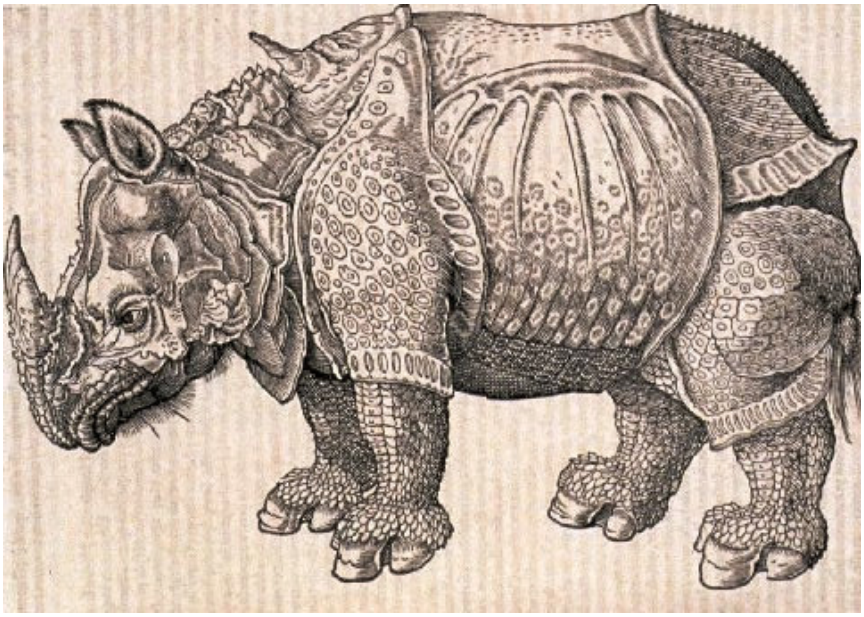

Figure 5. Conrad Gessner, copy of Dürer’s rhinoceros *Historia animalium*, 155

Figure 6. Ulisse Aldrovandi, *Rhinoceros unicornis,* Indian Rhinocerous, Tavole, Volume 1.2: Animals 460x360 mm (18.11”x14.17”), late 16th century/early 17th century

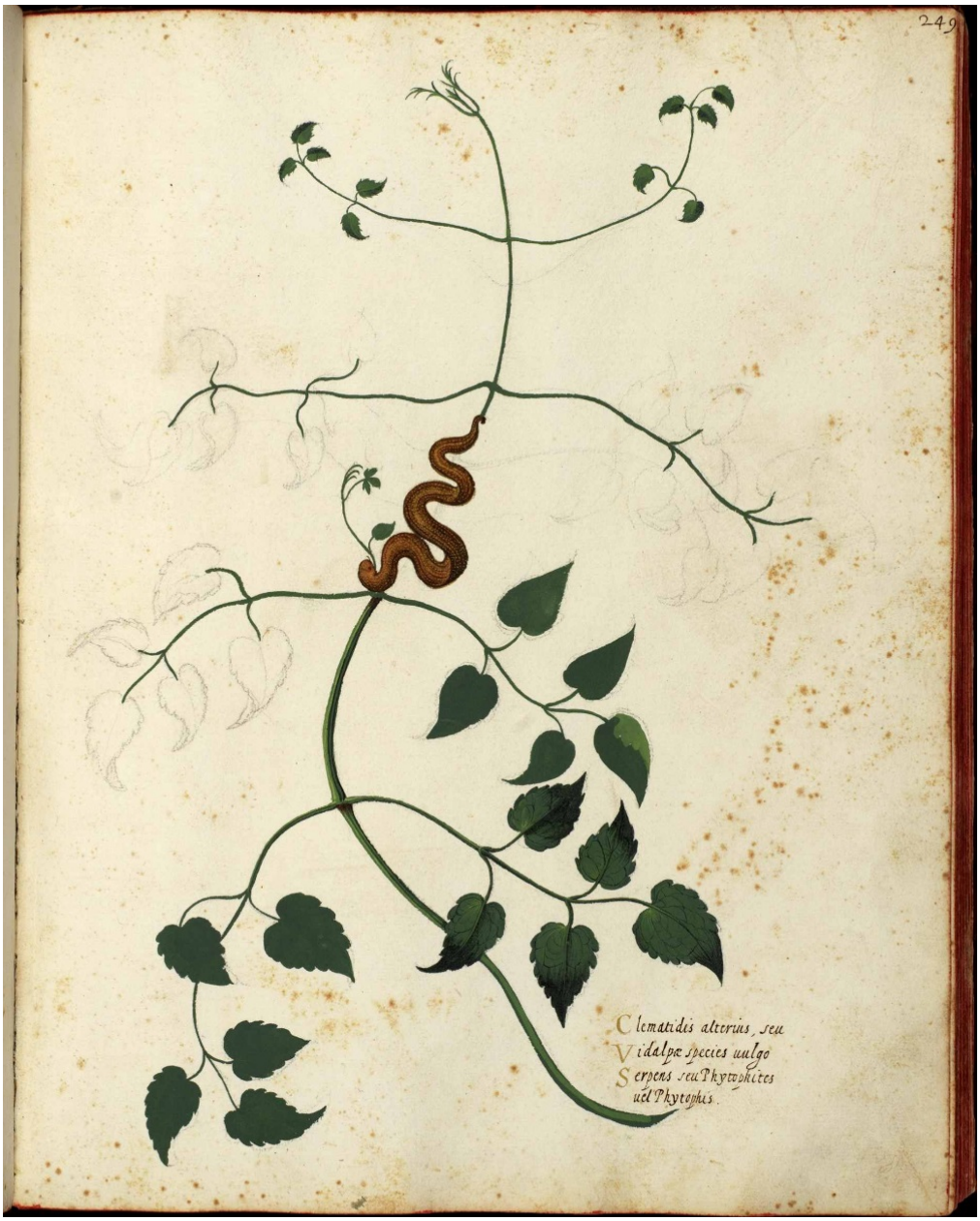

Figure 7. Ulisse Aldrovandi, *Clematidis*, Tavole, Volume 2: Plants 465x360 mm (18.31”x14.17”), late 16th century/early 17th century

Figure 8. *Tractatus de Herbis,* 1300CE 7.5”x4”

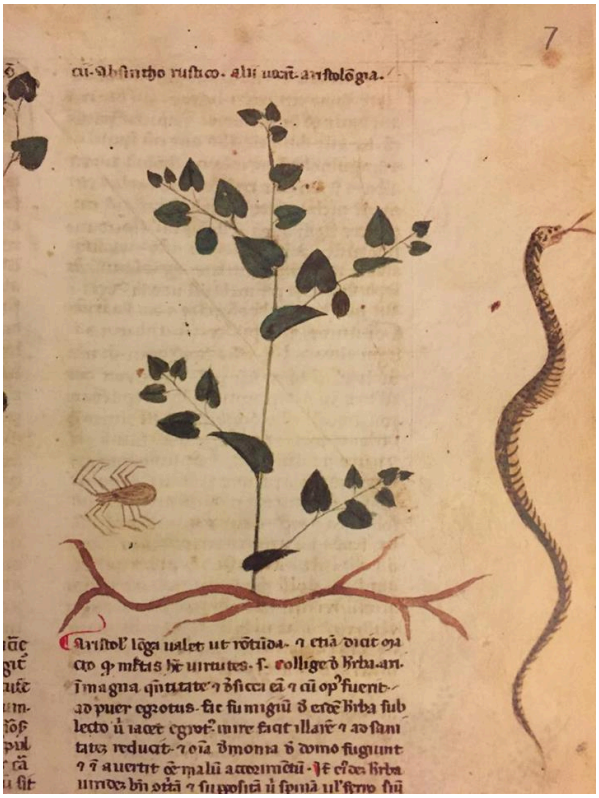

Figure 9. *Tractatus de Herbis,* 1300CE, 6”x5”

Figure 10. Ulisse Aldrovandi, *Ara macao*, Tavole, Volume 1.2: Animals 460x360 mm (18.11"x14.17"), late 16th century/early 17th century

Figure 11. “Mandragola,” 1431, The Bodleian Libraries

Figure 12. “Mandragore,” 1551, In William Turner *A New Herball*

Figure 13. Ulisse Aldrovandi, *Cucumis sativus*, Tavole, Volume 3: Plants Flowers Fruit 465x360 mm (18.31"x14.17"), late 16th century/early 17th century

Figure 14. Ulisse Aldrovandi, *Caryofillata montana*, Tavole, Volume 6.1: Plants Flowers Fruit 417x275 mm (16.42”x10.83”), late 16th century/early 17th century

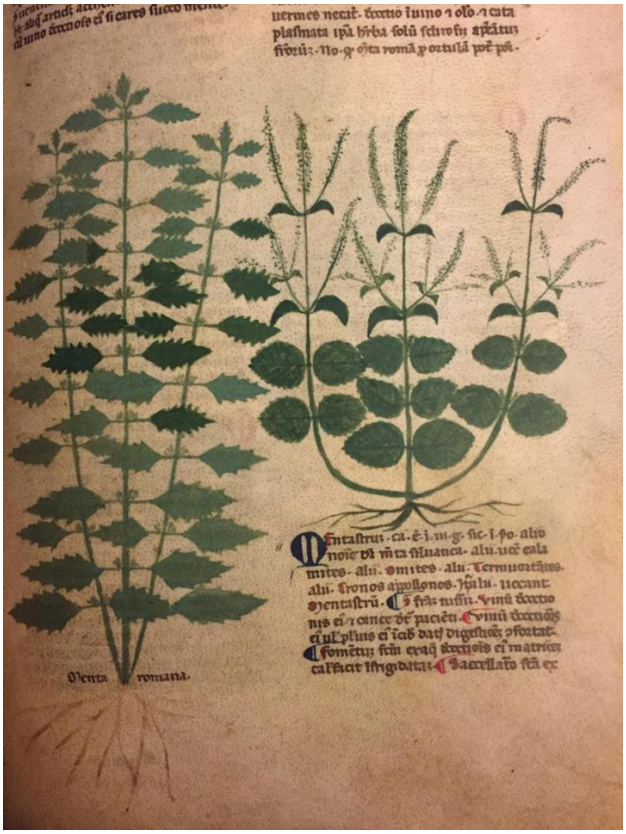

Figure 15. *Tractatus de Herbis,* 1300CE, 8”x9”

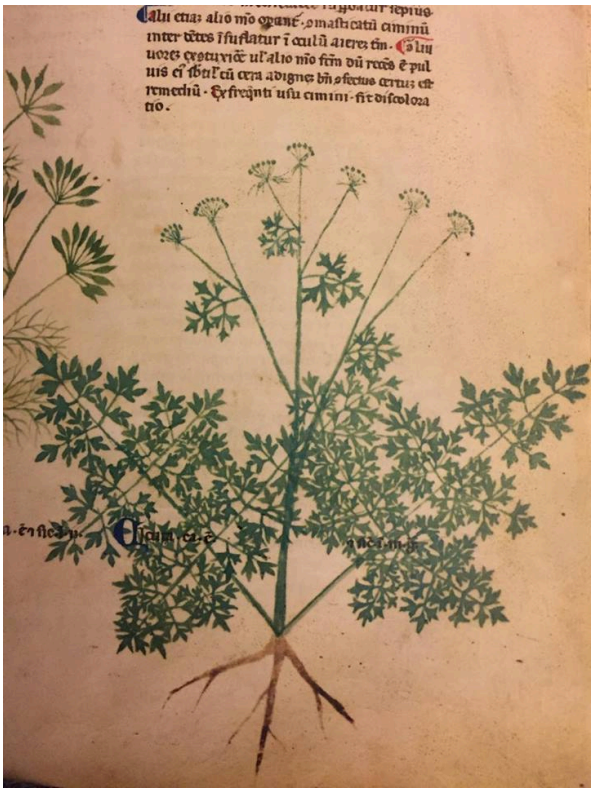

Figure 16. *Tractatus de Herbis,* 1300CE, 6”x7”

Figure 17. Ulisse Aldrovandi, *Citrus medica/ Citrium,* Tavole, Volume 3: Plants Flowers Fruit 465x360 mm (18.31"x14.17"), late 16th century/early 17th century

Figure 18. Ulisse Aldrovandi, *Averrhoa bilimbi*, Tavole, Volume 10: Plants Flowers, Fruits 415x278 mm (16.33”x10.95”), late 16th century/early 17th century

Figure 19. Ulisse Aldrovandi, *Berberis americanus*, Tavole, Volume 10: Plants Flowers, Fruits 415x278 mm (16.34”x10.95”), late 16th century/early 17th century

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