How are processes of vision, perception, and sensation conceived in the Renaissance? How are those conceptions made manifest in the arts? The essays in this volume address these and similar questions to establish important theoretical and philosophical bases for artistic production in the Renaissance and beyond. The essays also attend to the views of historically significant writers from the ancient classical period to the eighteenth century, including Plato, Aristotle, Plotinus, St Augustine, Ibn Sina (Avicenna), Ibn al-Haytham (Alhazen), Ibn Sahl, Marsilio Ficino, Nicholas of Cusa, Leon Battista Alberti, Gian Paolo Lomazzo, Gregorio Comanini, John Davies, Rene Descartes, Samuel van Hoogstraten, and George Berkeley.

Contributors carefully scrutinize and illustrate the effect of changing and evolving ideas of intellectual and physical vision on artistic practice in Florence, Rome, Venice, England, Austria, and the Netherlands. The artists whose work and practices are discussed include Fra Angelico, Donatello, Leonardo da Vinci, Filippino Lippi, Giovanni Bellini, Raphael, Parmigianino, Titian, Bronzino, Johannes Gumpp and Rembrandt van Rijn.

Taken together, the essays provide the reader with a fresh perspective on the intellectual confluence between art, science, philosophy, and literature across Renaissance Europe.

John Hendrix is a Professor of Architectural History at the University of Lincoln, UK, and a Lecturer at the Rhode Island School of Design and at Roger Williams University, USA.

Charles Carman is an Associate Professor of Art History at the University at Buffalo, USA.
A forum for the critical inquiry of the visual arts in the early modern world, *Visual Culture in Early Modernity* promotes new models of inquiry and new narratives of early modern art and its history. We welcome proposals for both monographs and essay collections which consider the cultural production and reception of images and objects. The range of topics covered in this series includes, but is not limited to, painting, sculpture and architecture as well as material objects, such as domestic furnishings, religious and/or ritual accessories, costume, scientific/medical apparata, erotica, ephemera and printed matter. We seek innovative investigations of western and non-western visual culture produced between 1400 and 1800.
Renaissance Theories of Vision

Edited by John Shannon Hendrix and Charles H. Carman
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ALICE CRAWFORD BERGHOF is a Lecturer in the Humanities at the University of California, Irvine.

AMY R. BLOCH is Assistant Professor of Art History at the University at Albany, the State University of New York (SUNY). She is a specialist in the study of fifteenth-century Italian sculpture, and has published articles on the Florentine sculptors Lorenzo Ghiberti and Donatello. She is currently writing a book on Ghiberti’s interpretations of Old Testament stories in the ten panels of the Gates of Paradise, a research project supported by a fellowship in 2009–2010 at the Villa I Tatti, the Harvard University Center for Italian Renaissance Studies in Florence.

CHARLES H. CARMAN is Associate Professor of Art History at the University at Buffalo, SUNY, and Director of Art History in the Department of Visual Studies. He is the author of Images of Dignity in Italian Renaissance Art.

LIANA DE GIROLAMI CHENEY is Professor of Art History, Chair of the Department of Cultural Studies, and Coordinator of Art History, Interdisciplinary and Intercollegiate Studies at the University of Massachusetts Lowell. She is the author of: Giuseppe Arcimboldo: Magical Paintings, Giorgio Vasari’s Teachers: Sacred and Profane Art, The Homes of Giorgio Vasari, Self-portraits of Women Painters, The Paintings of the Casa Vasari, and Botticelli’s Neoplatonic Images. She is a co-editor of: Neoplatonism and the Arts, Neoplatonic Aesthetics, Women Artists, Readings in Italian Mannerism, Piero della Francesca’s “Treatise on Painting,” Symbolism of “Vanitas” in the Arts, Medievalism and Pre-Raphaelitism, and Andrea del Verrocchio’s Celebration: 1435–1488.

NADER EL-BIZRI is Visiting Professor of Visual Studies at the University of Lincoln, UK. He also lectures at the University of Cambridge, and is a Research Associate at the Institute of Ismaili Studies in London, and a Chercheur Associé at the CNRS in Paris. He is the author of The Phenomenological Quest Between
Avicenna and Heidegger and editor of Epistles of the Brethren of Purity: The Ikhwan al-Safa’ and their Rasa’il.

John S. Hendrix is a Professor of Architectural History at the University of Lincoln, UK, and a Lecturer at the Rhode Island School of Design and Roger Williams University, USA. He is the author of Architecture and Psychoanalysis, Aesthetics and the Philosophy of Spirit, Platonic Architectonics, Architectural Forms and Philosophical Structures, The Relation Between Architectural Forms and Philosophical Structures in the Work of Francesco Borromini, and History and Culture in Italy, and a co-editor with Liana De Girolami Cheney of Neoplatonic Aesthetics and Neoplatonism and the Arts.

Christian Kleinbub is Assistant Professor of Italian Renaissance Art at Ohio State University. He is author of the forthcoming Vision and the Visionary in Raphael.

Nicholas Temple is Head of the School of Architecture at the University of Lincoln, UK. He is the author of Disclosing Horizons: Architecture Perspective and Redemptive Space, and an editor of Thinking Practice: Reflections of Architectural Research and Building Work, and The Humanities in Architectural Design.

Allie Terry is Assistant Professor of Art History at Bowling Green State University. She has published essays on Medici-sponsored art and politics, the ritual life of Florence, and violence in the early modern period. She is preparing a manuscript entitled Politics on the Cloister Walls: Fra Angelico and the Library of San Marco, as well as an edited volume entitled Beholding Violence in Medieval and Early Modern Culture.

Faye Tudor is concluding her PhD at the University of Strathclyde in Glasgow, Scotland, where she has taught electives on Renaissance and Postmodern literature, and lectured on John Donne and Phillip Sidney. Her research focuses on mirrors and mirror technology in Renaissance literature and art.

Thijs Weststeijn is a Postdoctoral Fellow at the University of Amsterdam. He has published The Visible World: Samuel van Hoogstraten’s Art Theory and the Legitimation of Painting in the Dutch Golden Age. He is currently preparing The Vernacular Arcadia: Languages of Art in Franciscus Junius’s The Painting of the Ancients (1637–1641).
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Most importantly, we would like to thank the contributors, all outstanding scholars, for their brilliant and insightful essays and their patience during the editing process.
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Over the past few years a number of colleagues have expressed to us what they feel is the need for a volume of essays on Renaissance theories of vision that would address the following basic questions: how are processes of vision, perception, and sensation conceived in the Renaissance, and how are those conceptions manifest in the arts? This volume is a response to that need.

We began discussions at the Renaissance Society of America conference at the University of Cambridge in 2005, and organized a series of panels which took place at the RSA conferences in Miami in 2007 and Chicago in 2008. Encouraged by the very positive response to the panels, the result is a collection of papers that probe important theoretical and philosophical aspects of artistic production in the Renaissance. We are confident that the volume will be of great interest and use for all who are engaged in thinking about and rethinking the questions that are concerned with an understanding of how vision is constructed in the Renaissance.

Written by art and architectural historians, these insightful studies assay deeply into philosophical and literary material to focus on how theories of vision are applied to and manifest in the visual arts. While discussion of the ways of seeing in the visual arts runs throughout art historical studies, this is the first volume that we know of which elevates theories of vision to the dominant theme in art historical considerations of the Renaissance. Though more specifically focused on Renaissance vision, these essays are preceded by, and hopefully add fundamentally to, two significant earlier compilations that we are aware of: *Visuality Before and Beyond the Renaissance: Seeing as Others Saw*,¹ and more recently *The Mind’s Eye: Art and Theological Argument in the Middle Ages*.² While the former established clearly a basis for intellectual seeing, the latter seeks to assert the importance of integrating theology into understanding meaning in medieval works of art. What is at stake is establishing not a one-to-one correspondence between textual significance and image, but rather how each might similarly frame shared philosophical or theological meaning. It is hoped that this present effort might help in establishing a sound foundation
for further art historical studies that find the Renaissance to share a similar point of view.

The relationship of empirical and spiritual as it appears in both visual and literary imagery is ubiquitously represented in terms of a tension that is seen to naturally lead to the erosion of any sustained unity of oppositions. We think, for example, of recent works that postulate this split as basic, though others suggest ways to maintain some balance between material and spiritual perceptions of reality. The essayists in this volume take up the issue in various ways, and see more continuity than division between the material and the spiritual as it is imagined and represented in Renaissance culture.

While it is assumed that readers will select topics from this collection according to what strikes them as immediately interesting, we have arranged the essays chronologically with the aim in mind to lay a broad historical foundation that may allow one to gain a sense of comprehensiveness and continuity across several centuries and many countries. Important European locations are included in these discussions: Florence, Rome, England, Austria, and the Netherlands. They include, as well, views of such historically significant writers—from the ancient classical period to the eighteenth century—as Plato, Plotinus, Pseudo-Dionysius, al-Kindi, Alhazen (Ibn al-Haytham), Avicenna, Roger Bacon, John Peckham, Erasmus Witelo, Nicolas Cusanus, Leon Battista Alberti, Marsilio Ficino, Baldassare Castiglione, Agrrippa von Nettesheim, Giorgio Vasari, Leonardo da Vinci, Gregorio Comanini, Gian Paolo Lomazzo, Sir John Davies, Samuel van Hoogstraten, and George Berkeley. Based on the theories of this rich tradition, the essayists carefully scrutinize and illustrate the effect of changing and evolving ideas of intellectual and physical vision on artistic practice through the works of artists such as Donatello, Fra Angelico, Andrea Mantegna, Leonardo da Vinci, Giovanni Bellini, Filippino Lippi, Titian, Raphael, Bronzino, Benvenuto Cellini, Johannes Gumpp, and Rembrandt van Rijn.

Some specific topics include the philosophy and science of optics (ancient, medieval, and early modern); an array of ocular functions such as visual rays, the optical nerve, and intromission and extramission theories of vision; single point perspective construction, catoptrics (the reflection of light from mirror surfaces), dioptrics (the refraction of light through lenses), light, and color. Analyses of physical phenomena are related to their sensual and conceptual functions, including the psychology of desire and sensorial experience as manifest within the philosophical tradition of Neoplatonism. Philosophical interpretations of light are explored, as well as the significance of the theology of redemption in the use of gesture and the gaze. Throughout, visual images are examined as the means to elucidate philosophical points of view. The visual and literary are seen to be mutually reflective of visuality as a shared understanding of how human beings perceive their relationship to the natural world in both physical and metaphysical terms.

Nader El-Bizri’s chapter carefully explains the more technical aspects of theories of vision in mathematical and geometrical applications, focusing on
John S. Hendrix and Charles H. Carman

the Optics (De Aspectibus or Perspectivae) of Ibn al-Haytham (Alhazen) and its investigation of optics, dioptrics, and catoptrics, providing an exhaustive list of resources for the reader to further explore Arabic scholarship on vision. El-Bizri examines the influence on Ibn al-Haytham of Arabic scholars such as al-Kindi, the Banu Musa, Thabit ibn Qurra, al-Quhi, al-Sijzi, and Ibn Sahl, as well as the wide-ranging influence of Ibn al-Haytham on scholars important to the emerging early modern theories of vision in the West. Particularly important here are Franciscan scholars such as Robert Grosseteste, Roger Bacon, John Peckham, and Erasmus Witelo, as well as figures such as Theodoric of Freiberg, Lorenzo Ghiberti, or Francesco Barozzi. In doing so, his chapter establishes a solid base that anchors the dialectic of physical and spiritual vision, variously probed in the subsequent chapters.

Charles Carman explores the relationship between the literal and the figurative in the single point perspective construction of Filippo Brunelleschi as codified by Leon Battista Alberti in his Della pittura. Often understood to be important in introducing a rationalized space through geometry, Carman views it as a way also to contextualize spirituality and intellectual content. He suggests that the distinctly different views about how perspective functions can be reconciled, that the rational and the spiritual/intellectual were intended to dialectically complement one another. In effect he argues, through an analysis of specific aspects of Albert's text, that this perspective system serves to symbolize a divine ontology. In this way Renaissance pictorial space represents a pre-anthropocentric view of the divine or infinite embodied in empirical reality. Indeed, vision itself, as a basis for conceptualizing a geometric system of perspective, is seen as entailing a coincidence of opposites, a “paradox of conflating incommensurables,” much as the theologian/philosopher Nicholas of Cusa also contextualizes vision. Carman casts geometric perspective as a metaphorical apparatus, as more of an allusion than an illusion, which aims to conjoin sense experience to spiritual and intellectual experience. His work addresses the core of the subject of Renaissance theories of vision, that underlying the visual images there is a subject matter that reflects the epistemology of the Renaissance, the philosophical and theological structures of knowledge.

Allie Terry's chapter on “Criminal vision in early modern Florence” focuses on images of Fra Angelico that reveal themselves as visual models of behavior and social values. In particular, she establishes how they were used as “pictures of redemption,” intended to invoke the desire for reform through stimulus to forgiveness, ascension of the soul, and spiritual reward. This includes the role that the pictorial representation of the gaze plays in defining social values, and the importance of the living, sentient body in the visual image to communicate those models of behavior and values, borrowing from the discipline of somaesthetics. In this regard, the author demonstrates how juxtaposition of the body and the spirit in the painted image enacts transitional and transformative states, both physically and psychologically. Overall, it is the performative aspects of the viewing experience that are
explored, including suppositions about how the viewer is conditioned by the painting to facilitate a particular response.

In her chapter on Donatello's bronze tondo, the Chellini Madonna, Amy R. Bloch provides a concrete example of how theories of vision—including optics, dioptrics and color theory—were generated in late medieval scholarship, and how they can be applied to an explanation of Renaissance artistic production. Her heuristic example is shaped around Donatello's hypothetical use of the unique hollowed-out depression on the reverse of the tondo executed for Giovanni Chellini, for the purpose of casting glass copies of the image on the front. Speculating about glass figures of the Virgin and Child, Bloch explores the implications of the theology of light, considering the writings of Pseudo-Dionysius in the role that light can play in transporting the viewer from the material to the immaterial realm. She uncovers the theological implications of the transformation of one substance to another in sculpture, and the same implications of additive sculpture in various media, as representing the divine creation of humanity. In considering how the images cast in glass might be viewed in fifteenth-century Florence, Bloch discusses the classical and medieval intromission and extramission theories of vision, in particular as found in the Liber canonis of Avicenna, which Chellini possessed in his library, and the De aspectibus of Ibn al-Haytham, the treatise examined in the previous chapter by Nader El-Bizri, which was well known in fifteenth-century Florence. Ultimately, viewing the glass copy of the tondo would be compared to participating in the Eucharist of the Transubstantiation, as rays of light passing through the glass effigy could be seen as the word or spirit of God. Thus it becomes clear how the interpretive effort might benefit from interweaving the metaphorical hues of text and image to create a richly colored fabric, one that might be understood to reflect the mind's grasp of shared notions figured forth into the light of the physical world.

John Hendrix's understanding of Marsilio Ficino's De amore and its implications for artistic production in Quattrocento Florence and beyond adds much to the sense of a shared visuality that joins the figurative in both text and image. The De amore (Commentary on Plato's Symposium) expresses some of the basic aesthetic theories of the Platonic Academy in Florence, whose discourse had a profound influence on artistic production. The thesis of the chapter argues that seeing, in regular vision and in viewing a work of art, is a function of love or desire, and a philosophical point of view. Perspectival construction itself is a product of this desire to link vision with desire and thought, and it can be seen as a vocabulary element in the language of visual production in the same way that language itself enacts love and desire. The chapter examines the influence of Plotinus on the philosophy of Ficino as fundamental for aesthetic theory during the Renaissance. Leon Battista Alberti’s De pictura and Piero della Francesca's De prospectiva pingendi, the chapter argues, reveal the importance of the Plotinian theory of perception as a conceptual process. This is especially evident for Hendrix in the distinction Alberti and Piero make between seeing as, on the one hand, a process that
conceptually unifies the sensible world, and on the other hand, a perception wherein the sensible world can only be given as fragmented and multiple.

Liana De Girolami Cheney analyzes the aesthetic theory of Leonardo da Vinci, also echoing a common theme among these chapters that envisions a unity between empirical and spiritual implications. Examining the *Notebooks* and *Treatise on Painting* of Leonardo, Cheney discusses the influence on Leonardo of the ancient and medieval science of optics, including the intromission theory. She examines how Leonardo combines the importance of experimentation with the concept of forming laws through vision, and scientific theories of the eye (anatomical, physiological, neurological) with mathematics and geometry, in particular linear perspective. Her conclusion, for example, that the eye is ultimately able to see “divine things,” helps draw the dialectics of material and spiritual vision into a useful understanding of Renaissance visuality. And, she does so by analyzing Leonardo’s Uffizi *Annunciation* of 1472–78, to show how the artist formulates principles of painting in relation to theories of vision consistent with understanding the natural and divine as complementary.

Subsequently, for Christian Kleinbub, cloud putti in Italian Renaissance painting represent the boundaries of the visible world. Indeed, they illustrate the theological concept of the invisible being made visible, or the visionary made accessible to the corporeal eye. Focusing on paintings by Andrea Mantegna, Giovanni Bellini, Filippino Lippi, Fra Bartolommeo, and Raphael, for example, Kleinbub explores the appeal to internal experience through vision in painting that does not include geometric perspectival construction as a rationalized space. These works are seen as paradigmatic of more imaginative models of vision that are later manifest in the subjective spirituality and mysticism of the Counter Reformation and Baroque period. The author excavates textual, theological precedents in Augustine and Thomas Aquinas to help explain such manifestations of the spiritual. Following a track from the embodied putti of Mantegna to the transparent putti of Bellini, to the theological glory of the putti of Titian, the more integrated putti of Lippi and Bartolommeo, and finally to those of Raphael, we find revealed ubiquitous, liminally veiled images of the essence of what is concretely sacred and which provide access to the supernatural.

Nicholas Temple then explores the role that pictorial space plays in communicating the function of gesture in its ethical, political, and theological implications in Raphael’s *School of Athens* and *Disputa*. The analysis discloses how “gestures reveal a deeply embedded redemptive understanding of human experience.” Temple interprets Raphael’s single point geometric construction and its role in establishing relationships between gestures, creating an istoria, and enacting an anamnesis or recollection, to communicate important philosophical and theological themes, in particular as they are related to classical precedents. With erudite understanding of the dialectics of the metaphysical and the empirical—spiritus and sensus—and their interactive roles in the evolving tradition of *vita contemplativa* and *vita activa,*
Temple explains the role of geometry as an epistemological scaffolding, as pictured in the *School of Athens* and represented in its architecture, rendered to facilitate Raphael’s goal in articulating this interaction of the material and the spiritual.

Thijs Weststeijn contributes an insightful examination of the coexistence of intromission and extramission theories of vision in Renaissance cultural production. In particular, he wants to understand how the viewing of a work of art was expected to take place in the Renaissance, and how works of art stage modes of vision. Weststeijn examines classical and medieval foundations, in particular the intromission theories of Aristotle, Alhazen and Averroes, and the extramission theories of Plato and Galen. He looks as well at Southern cultural production, such as the theories of vision of Marsilio Ficino (*Theologia Platonica* and *De amore*), Leon Battista Alberti (*Della pittura*), Gregorio Comanini (*Il Figino*), and Gian Paolo Lomazzo (*Trattato della pittura*), and the courtly love lyrics of Baldassare Castiglione in the *Libro del cortegiano*. And finally, he moves into an examination of Northern cultural production through the theory of vision of Samuel van Hoogstraten, a pupil of Rembrandt, as well as through the optical theory of Agrippa von Nettlesheim, particularly the *De occulta philosophia*. Among the various art works that Weststeijn selects to demonstrate the reciprocal relationship between theory and meaning in images are the *Salome* of Titian, the *Pygmalion and Galatea* of Bronzino, the *Perseus* of Benvenuto Cellini, and versions of the *Judith and Holofernes* by Cristofano Allori and Peter Paul Rubens.

Faye Tudor then conveys the reader into the fascinating ambiguity of the mirror metaphor and the role its reflective power plays in optics and catoptrics within Renaissance theories of vision. She takes as examples both a work of literature by an English author, Sir John Davies, and a painting by an Austrian painter, Johannes Gumpp, as illustrations of the importance of mirror reflection in Renaissance thought, and its proliferation in Renaissance artistic production. From the development of optical theory in classical philosophy as a basis for the proliferation of interest in optics and catoptrics, she explains how the mirror is seen as both providing access to sensible reality and distorting it. By examining the use of the mirror as a metaphor for the mind in relation to the senses, the author explores the classical distinction between discursive reason and intuition. Here again, what emerges as a common theme independently explored in one way or another by all the authors in this volume is that discursive reason or logic is seen as a mirror reflection of intelligibles or archetypal concepts. The status of burgeoning empirical reasoning again seems to collide with spiritual/metaphysical instantiations aided by a metaphor that binds one mode of vision to another.

In the final chapter, Alice Crawford Berghof examines the relation between depth perception and the sense of touch in late Renaissance art. The chapter establishes an analogy between the “rough style” of Rembrandt, the *sprezzatura* of Velázquez, and the notion of the “tangible object” of George Berkeley. Berghof argues that there is a connection between real tactile
information and imagined visual information, which may be a presumed or unexplained cognitive connection, and which creates a narrative, which is a form of experience in depth perception. By taking as a point of departure the question as to whether depth perception is the product of immediate, visceral sense experience or is constructed intellectually as a product of experience (Berkeley), the author seeks to combine the two positions in aesthetic theory.

Pointing beyond their specific topics and the lessons learned from the wide and deep array of authors drawn upon, who constitute the foundation material informing their arguments, the authors of these works take up underlying issues that seem to continually surface in discussions of visuality, text and image—especially those of how to deal with the appearance of the real in what is still essentially a spiritually/metaphysically driven conception of the role of art. As a short collection of essays, however, they are not intended to be an exhaustive exploration of critical issues. Rather, the hope is that the ideas presented here might be seen as participating in a newly developing disciplinary direction in art historical scholarship, one that integrates underlying theories of vision with artistic production in order to more fully understand both intention and reception.

In the desire to introduce a comprehensive understanding of Renaissance theories of vision, the volume offers a wide and rich range of historiographical perspectives and theoretical positions as the basis for analysis. Every chapter establishes a sound historiographical framework in which to develop an original interpretation of visual production in relation to the textual content of philosophical, theological, scientific and literary works. Alexandre Koyré and Dalibor Vesely are cited by Nader El-Bizri on the development of scientific thought, which is then applied to optical theory. The work of Martin Kemp, Erwin Panofsky, Samuel Edgerton, Karsten Harries, and Anthony Grafton is presented by Charles Carman to provide the groundwork for theories of perspective, and from that groundwork is developed a new understanding of the meaning behind the mechanisms. The theories of Richard Shusterman on somaesthetics and the social and cultural body, and Patricia Simons on functions of control and the gaze in the visual image, provide for Allie Terry a theoretical framework for a new understanding of Renaissance painting as a behavioral instrument in Florentine society.

David Lindberg’s work is taken as an important source for theories of vision which are applied to Renaissance production in particular by Amy Bloch, as it is seen to be a development of medieval concepts and values, thus expanding the historiographical concept of the Renaissance. John Hendrix builds upon the tradition established by writers such as Erwin Panofsky, Ernst Cassirer and Paul Oskar Kristeller of interpreting Renaissance art in relation to classical philosophy. In the close reading of Marsilio Ficino, Leon Battista Alberti, and Piero della Francesca, Hendrix demonstrates the debt of these writers in particular to Plotinus, and establishes a continuity between the classical, Renaissance, and modern worlds in the bases of thought and artistic expression. A theoretical basis for the application of science and mathematics
in the visual arts is derived by Liana Cheney from the writings of Irma Richter, Martin Kemp, Kenneth Keele, and Jane Aiken, which then provides the groundwork for an expanded context, and an increased understanding of the optical theories of Leonardo da Vinci.

Christian Kleinbub refers to Mary Carruthers, Hubert Damisch, Horst Waldemar Janson, Hans Belting, John Shearman, and Charles Dempsey on theological considerations of the visionary in visual images, in order to paint a revisionary picture of the imagery of Renaissance painting as already containing the basic themes of the Baroque. Nicholas Temple establishes a wide-ranging philosophical framework for the interpretation of gesture and spatial construction in Renaissance painting, incorporating the thought of Edmund Husserl, Martin Heidegger, and David Michael Kleinberg-Levin. Like all the chapters, Temple's places Renaissance art in a larger context, establishing the visual imagery of the Renaissance as an important element of philosophical discussion in general, from the classical world to the present day. Temple also cites Ernst Gombrich, Edgar Wind, Ingrid Rowland, and Christiane Joost-Gaugier on the issue of traditional iconographic interpretation, suggesting new applications within the broader philosophical framework.

In an intricate operation, Thijs Weststein builds upon the work of writers such as Waldemar Deonna, John Shearman, and Pamela Smith in order to weave an elaborate and sophisticated network of science, optics, literature, art theory, and visual images, illustrating the depth of the extent of contextual relationships that the Renaissance image contains. Weststein's network also serves to demonstrate how imagery communicates the varieties of the physical and symbolic functions of the eye in vision. Faye Tudor refers to the work of Deborah Shuger, Edward Nolan, Herbert Grabes, and Stuart Clark in the development of her theoretical approach to specular images in the Renaissance, which goes so far as to suggest the formation of the modern subject, as psychologically divided rather than unified. As happens in many places in this volume, a way of thinking which is usually taken as particularly modern is found to exist in the Renaissance. The volume thus expands our knowledge of the origins of modernity in the Renaissance. Alice Berghof builds upon the work of Svetlana Alpers, Harry Berger, Norman Bryson, and Ernst van de Wetering in order to explore the social and political implications of materiality in relation to depth perspective. In her chapter, philosophical developments are shown to run parallel to artistic developments, so that the evolution of visual representation can be seen as a document of the evolution of philosophical conceptions, as well as the more traditional obverse relation.

The volume addresses the most important theoretical and critical problems at stake in the application of theories of vision to works of art, and the relation between the text and the image. The general premise throughout the chapters is that there is an underlying conceptual structure connected with forms in visual expression, and that visual expression functions as a document which can be read and interpreted in that context. Philosophical and theological concepts are transformed into images by visual mechanisms which can be
seen to correspond to linguistic mechanisms, which connect the images to complex intelligible structures, which are the product of the culture which produces them. This is in fact a process or an analytical methodology described by many Renaissance writers themselves, including Leon Battista Alberti and Marsilio Ficino. The visual image is seen to function as a kind of catechism of the perceptual and imaginative processes of the artist as well as the viewer, so that to a certain extent the visual image can hold a mirror up to the intellectual processes of the artist and viewer. The methodology introduced in these chapters constitutes a kind of structuralist psychoanalysis of artistic intention and effect. The chapters, written by leading scholars in the field of art history and visual studies, represent the newest advance in art historical methodology and interpretation, built upon a solid foundation of previous developments.

Notes


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Classical optics and the *perspectivae* traditions leading to the Renaissance

*Nader El-Bizri*

**Preamble**

Many academic studies have focused on investigating the influences of medieval European *perspectivae* on Renaissance theories of vision; however, the scholarly exploration of Graeco-Arabic legacies in optics that scientifically grounded these traditions is much rarer in connection with the Renaissance. It is hardly an exaggeration to note in this context that the most remarkable revolution in the classical science of optics from the second century till the seventeenth century (namely from the era of Ptolemy to that of Kepler) is embodied in the research of the Arab polymath al-Ḥasan Ibn al-Haytham (known in Latin as Alhazen; b. Basra 965 CE, d. Cairo c. 1041 CE).

Ibn al-Haytham’s groundbreaking studies in optics, including his research in catoptrics and dioptrics (respectively the sciences investigating the principles and instruments pertaining to the reflection and refraction of light), were principally gathered in his monumental opus: *Kitāb al-manāẓir* (*The Optics; De Aspectibus or Perspectivae; composed between 1028 CE and 1038 CE*). This classic corpus was divided into seven books that were grouped under three principal parts: Books I–III dealt with the problems of rectilinear direct vision, Books IV–VI focused on the science of catoptrics, and Book VII was dedicated to the science of dioptrics. In this revolutionizing *oeuvre*, Ibn al-Haytham devised a scientific solution to ancient controversies over the nature of vision, light, and color, which were disputed between the classical mathematicians (mainly the exponents of Euclid’s and Ptolemy’s legacies in optics) and the Aristotelian physicists. Ibn al-Haytham’s research in optics (including his studies in catoptrics and dioptrics) benefited from the investigations of his predecessors in the Archimedean-Apollonian tradition of ninth-century Arab polymaths, like the Banū Mūsā and Thābit ibn Qurra, and of tenth-century mathematicians, like al-Qūhī, al-Sijzī, and Ibn Sahl. Ibn al-Haytham’s *Kitāb al-manāẓir* (*The Optics*) was translated by Gerard of Cremona into Latin under...
the title: *De Aspectibus* (also known as *Perspectivae*), and it closely influenced the research of Franciscan scholars of optics in the thirteenth century, like Roger Bacon, John Peckham, and Witelo. Ibn al-Haytham’s tradition had also a direct impact on the investigations of fourteenth-century opticians, like Theodoric (Dietrich) of Freiberg (d. c. 1310 CE) and Kamāl al-Dīn al-Fārisī (d. c. 1319 CE); both scholars offered correct and experimentally oriented explications of the phenomenon of the rainbow and its coloration, while basing their studies on reformed revisions of Ibn al-Haytham’s theory of colors. Ibn al-Haytham’s and al-Fārisī’s tradition in Islamic civilization was subsequently continued through the investigations of the Syrian astronomer at the Ottoman court, Taqi al-Dīn Muḥammad ibn Maʿrūf (d. c. 1585 CE). Moreover, the Latin and Italian translations of Ibn al-Haytham’s *Kitāb al-manāẓir* impacted scholars of the caliber of Biagio Pelacani da Parma, Francesco Maurolico, and Ettore Ausonio. Ibn al-Haytham’s opus was also assimilated in Renaissance mathematical and scholarly circles partly through Witelo’s *Perspectivae*, which closely paraphrased many of its sections, and acted through its Italian translation as the main theoretical source for Lorenzo Ghiberti’s *Commentario Terzo*. The Latin version of Ibn al-Haytham’s *Kitāb al-manāẓir* was eventually printed under the title *Opticae Thesaurus Alhazenii* in the edition of Friedrich Risner, which was published in 1572 in Basle. This version of Ibn al-Haytham’s *Optics*, which became available in print, was read and consulted by scientists and philosophers of the caliber of Kepler, Galileo, Descartes, and Huygens.

An investigation of the historical and epistemic bearings of Ibn al-Haytham’s tradition in optics elucidates some of the dynamics that are at work in the emergence and development of novel scientific rationalities. His influential legacy established the principal scientific foundations of medieval *perspectivae* in the European traditions, and through them, it grounded the Renaissance theories of vision and perspective, while continuing furthermore to influence the unfolding of the science of optics up to the seventeenth century. In view of all of these historical and epistemic dimensions, I will mainly focus in this chapter on Ibn al-Haytham’s theories of vision, light, and color, and in the course of this inquiry I will also examine some of the applications of mathematics (principally geometry) in the science of optics, with a particular emphasis on Ibn Sahl’s dioptics (fl. mid-tenth century CE). In addition, I will also consider Kamāl al-Dīn al-Fārisī’s (d. c. 1319 CE) explication of the phenomenon of the rainbow (*qaws quzaḥ*) in terms of his reforming commentary on Ibn al-Haytham’s *Optics* in *Tanqīḥ al-manāẓir* (*The Revision of [Ibn al-Haytham’s] Optics*). I will, moreover, account for selected historical developments in geometry that resulted in Ibn al-Haytham’s *mathematical* conception of place (*al-makān*) as extension *qua* space, which necessitated his refutation of the definition of *topos* as argued in Book Delta of Aristotle’s *Physics*, and also corresponded conceptually with his investigation of the visibility of spatial depth in the *Optics*. 
While Ibn al-Haytham’s research in optics proved to be a revolutionizing tradition in the course of development of this scientific discipline up to the seventeenth century, other legacies in optics existed in the history of ideas in classical Islamic civilization. One of these principal traditions is attributed to the research of the Arab philosopher al-Kindī (d. c. 873), who partly influenced the optical investigations of Robert Grosseteste (d. c. 1253) through the Latin version of his De Aspectibus.\(^7\) However, this tradition in optics was primarily Euclidean and Ptolemaic, as was also later the case with the research of the Persian mathematician and philosopher Naṣīr al-Dīn Ṭūsī (d. c. 1274). It is also worth noting in this regard that the celebrated philosopher and physician Ibn Sinā (Avicenna; d. 1037 CE) adopted a physical “intromission” theory of vision that is akin to that of Aristotle, and his contributions in optics were not as influential as those of Ibn al-Haytham. None the less, his research on the anatomy of the eye in his monumental Qânūn fī al-ṭibb (Canon of Medicine) impacted the evolution of ophthalmology up to the sixteenth century, and his research in meteorology inspired al-Fārisī’s revision of Ibn al-Haytham’s Optics. Furthermore, Ibn Sinā’s theory of perception was ecumenically influential in Islamic civilization and European medieval scholarship, particularly in terms of elucidating philosophical meditations on the nature of the soul (al-nafs) and the bearings of its cognitive faculties.\(^8\)

**Mathematics and optics**

An investigation of classical optics necessitates the examination of the role of mathematics (geometry in particular) in the development of this scientific discipline. Mathematics permeated the intellectual history of medieval Islamic civilization. Besides accomplishments in the various domains of mathematical research, and the novel methods of inquiry devised in support of their advancement, the applications of mathematics sustained the progress of numerous scientific disciplines in medieval Islamic civilization. The mathematical sciences performed significant epistemic functions in grounding the systemic and technical development of optics, astronomy, mechanics, geography, and the applied arts of surveying and timekeeping. Mathematics also informed the theoretical and practical efforts invested in the perfection of scientific instruments like astrolabes, compasses, sundials, celestial globes, and the modeling of lenses, along with the investigation of the geometrical principles underlying their construction.

Considerable contributions were advanced in geometry, algebra, arithmetic, and trigonometry. Novel solutions were devised to ancient geometrical problems, and new questions in mathematics were formulated, including the establishment of complex methodologies of mathematical research. The application of the newly founded discipline of algebra (ninth century),\(^9\) to arithmetic and geometry, and of these mathematical disciplines unto one another, all produced novel branches of research in mathematics, with their
prolongations in optics, astronomy, mechanics, and physics. This also resulted in the flourishing of investigations in conics, stereographic projections, geometric transformations, infinitesimal mathematics, algebraic geometry, and combinatorial and numerical analysis.\textsuperscript{10}

The application of algebra and geometry unto each other allowed mathematicians to render solid geometrical problems into algebraic equations, and to also resolve these by way of the intersection of conic curves.\textsuperscript{11} This mathematical development resulted also in the founding of the novel discipline of “geometrical algebra,” and the flourishing of research on geometrical transformations (like similitude, translation, homothety, and affinity). Geometers were no longer solely interested in studying figures, but they also closely investigated the relations uniting them. This new orientation in geometry resulted in the development of the “science of projection” (\textit{\‘ilm al-tastih}),\textsuperscript{12} which was in part also inspired by research in mathematical astronomy. Another major consequence of the novel investigation of geometrical transformations was also the unprecedented introduction of motion (\textit{\‘araka}) in geometrical enunciations and demonstrations. All of these developments necessitated the epistemic reorganization of the elements of geometry in terms of motion, and a rethinking of the notion of “place” (\textit{al-makān}) from a mathematical standpoint that overcomes the geometrical shortcomings of the Aristotelian physical conception of \textit{topos} as “enveloping surface.”

Furthermore, the applications of conics informed the complex optical studies that were undertaken on the burning sphere, the spherical diopters, lenses, and burning mirrors. This tradition in Arabic sources impacted the investigations of Renaissance theorists of the \textit{Cinquecento} on the use of conic sections as optical-geometrical tools to perfect the construction of perspectives, as was the case, for instance, with Francesco Barozzi (Franciscus Barocius, mainly in his \textit{Admirandum illud Geometricum Problema tredecim modis demonstratum}).\textsuperscript{13} Moreover, phenomena that were originally treated as topics of meteorology were re-studied according to the new models of “reformed” optics (as was the case, for instance, with studying the rainbow and the halo). Fundamental epistemic questions were also debated in the “philosophy of mathematics” with reflections on their cognitive and methodological entailments. These endeavors were supported by elaborate critical and analytic commentaries on mathematical treatises that were translated, adaptively assimilated, and innovatively expanded in reference to the legacies of Euclid, Archimedes, Apollonius of Perga, Diophantus, Menelaus of Alexandria, Ptolemy, Heron of Alexandria, and Pappus of Alexandria.

\textbf{Dioptrics and conics}

Based on catoptrics and the study of burning mirrors and lenses, Abū Saʿd al-ʿAlāʾ Ibn Sahl (d. c. 1000 CE) devised a systemic elaboration of the fundamentals of dioptrics (the study of the geometrical principles of the
refraction of light, and the geometrical properties of the configurations of diopters, and of the refractive characteristics of the passage of light through transparent media). It is believed that Ibn Sahl established a principle akin to the so-called “Snell’s Law” of refraction (a formula used in the calculation of the refraction of light between two media of differing refractive indexes, named after the seventeenth-century mathematician Snellius Willebrord, which was also investigated by Thomas Harriot and Descartes). Ibn Sahl shows that every transparent medium, including the “celestial sphere,” has a certain degree of opacity. Yet in his research on burning optical instruments he no longer determines transparency in terms of opacity, but rather characterizes it by a constant ratio, which acts as the basis of his study of the refraction of lenses. He postulated that this ratio is the inverse of the index of refraction ($n$) of a given transparent medium (for example, a crystal) with respect to air.\textsuperscript{14}

Ibn Sahl’s research in dioptrics rested on geometrical enunciations and demonstrations based on the study of conic sections (ellipses, parabolas, hyperbolas). His studies on burning instruments (harrāqāt) and the burning sphere (al-kura al-muhriqa)\textsuperscript{15} were thoroughly analyzed by Ibn al-Haytham, and this resulted partly in the latter’s explication of spherical aberration in terms of studying the properties of lenses, including an investigation of the optical properties of the crystalline.

Ibn al-Haytham’s research on vision (al-baṣar), and particularly on the introduction of light into the eye, which is analyzed by way of examining the optical and geometrical properties of the anatomy of the crystalline, were all entangled with his research in dioptrics and conics. Ibn al-Haytham’s demonstrations with respect to the intromission of light via the outer surface of the crystalline rested on his research in geometrical optics and on his resultant determination of “spherical aberration.” The studies that were conducted on the optical properties of conics in Ibn Sahl’s dioptrics, and his demonstrations showing that conical sections are ideal aspheric shapes for lenses (plano-convex, bi-convex, plano-concave, bi-concave), were all further elaborated by Ibn al-Haytham in his research on spherical aberration,\textsuperscript{16} and on its application in the optical and anatomical study of the passage of light via and through the crystalline in explicating vision. Ibn al-Haytham’s commentaries on Ibn Sahl’s research in dioptrics eventually informed the reformative research in optics of Kamāl al-Dīn al-Fārisī in Tanqīḥ al-manāẓir (The Revision of [Ibn al-Haytham’s] Optics), who in his turn established an accurate explication of the rainbow’s coloring.

The anaclastic research on conics in terms of systematizing the science of dioptrics and the investigation of the properties of its instruments (diopters, lenses, and tools of measurement) was fundamental to solving geometrical problems that could not be resolved using an unmarked ruler and a compass. The effort to combine the geometries of conics, and those of projections and transformations, with neusis (namely, a verging geometric construction that adjusts a measured length on a marked straight edge to fit a diagram) all bestowed an epistemic legitimacy to the construction and use of scientific
instruments (diopters, compasses, astrolabes, celestial globes, sundials). This mathematical procedure also evolved into methods deploying the intersections of conics, in addition to introducing novel directions in mathematics involving loci and quadratic surfaces (resonating with Pierre Fermat's *Loci in Surfaces*; seventeenth century). Furthermore, conic sections were distinguished from curves that could be generated via mechanical motion (namely by deploying instruments [compasses] and mechanical procedures); geometry rather than mechanics was fundamental in founding dioptrics and expanding research in catoptrics.

Besides his research in optics, Ibn al-Haytham advanced compelling investigations in mathematics. For instance, he assessed Apollonius of Perga's *Conica* in his *Maqāla fi tamām kitāb al-makhrūtāt* (On the Completeness of the Conics), and in his *Shakl Banū Mūsā* (The Proposition of the Banū Mūsā; namely, making reference to the erudite sons of Mūsā ibn Shākir; fl. Baghdad, ninth century). Moreover, his geometric *Lemmas* (muqaddimāt), which came to be known among seventeenth-century European mathematicians as: “Alhazen's Problem,” became a classic in the history of science in describing a solution to the question: “How, from any two points opposite a reflecting surface (plane, spherical or cylindrical) can we find a point on that surface at which the light from one of these two points reflects unto the other?” Ibn al-Haytham also attempted to solve Euclid’s Fifth Postulate, and composed a commentary on the premises of the *Elements* (*Sharḥ mušādarāt kitāb Uqūdis*). He furthermore dedicated two tracts to studying “the quadrature of crescent figures/lunes” (*al-ashkāl al-hilāliyya*). He also systematized analytical geometry by deploying algebra in geometric constructions, and furthered the field of infinitesimal mathematics. In the domain of number theory, he built on the works of Thābit ibn Qurra (d. 901 CE), and on the findings of the latter’s grandson, Ibrāhīm ibn Sinān (d. 946 CE), by investigating amicable numbers (*a*dād mutahābbā; namely a pair of numbers each of which equals the sum of the other’s aliquot parts) and perfect numbers (*a*dād tāmma; namely a numeral whose positive divisors, excluding it, sum up to itself). In addition, Ibn al-Haytham contributed engaging studies in mathematical astronomy, such as those included in his *Shukūk ‘alā Baṭlāmiyūs* (Dubitationes in Ptolæaeum; a critique of Ptolemy’s *Almagest*, *Planetary Hypotheses*, and *Optics*), or in his *Ru’yat al-kawākib* (The Appearance of the Stars), or *Maqāla fi ʿadwāʾ al-kawākib* (Treatise on the Lights of the Stars). He also investigated the density of the atmosphere, the nature of the eclipse (*Maqāla fi ṣūrat al-kusūf*), the twilight and moonlight (*Risāla fi ʿawwāʾ al-qamar; Treatise on Moonlight*). Moreover, he inquired about a principle akin to “the first law of motion” in mechanics, according to which it was observed that a body would move perpetually unless arrested by an external agent. And, in his elucidation of phenomena associated with the attraction between masses, he made observations regarding the magnitude of acceleration, which resulted from a principle crudely analogous to a force of gravity. Ibn al-Haytham’s methodology consisted of combining mathematics with physics in the context of experimental demonstration, verification, and
controlled testing (al-īʾtibār). This endeavor included the design and use of scientific instruments and installations (like al-bayt al-muẓlim/camera obscura, which also constituted a vital notion in medieval and Renaissance perspectivae traditions).

Optics: Theories of vision and light

One of the principal aspects of Ibn al-Haytham’s reforming of the science of optics is encountered in his ingenious resolution of the long-standing ancient dispute between the mathematicians (aṣḥāb al-ṭālīm; the exponents of the traditions of Euclid and Ptolemy) and the physicists (aṣḥāb al-ʾilm al-ṭabīʿī; mainly of Aristotelian inspiration) over the nature of vision and light. Ibn al-Haytham showed that vision occurs by way of the introduction of physical light rays into the eye in a configuration that is geometrically determined in the form of a pyramid/cone (makhruṭ) of vision, with its vertex at the center of the eye and its base on the visible and lit surfaces of the object of vision. He thus rejected the emission (“extramission”) theory of the mathematicians, which held that vision occurs by way of the emission of a subtle and non-consuming ray of light from the eye that meets the lit medium, which, as a physical phenomenon, is structured geometrically in the form of a cone/pyramid. In view of explicating the process of vision, Ibn al-Haytham retains the geometric modeling as presented by the ancient mathematicians (mainly as derived from the adaptations of Euclidean and Ptolemaic optics), while emphasizing that it was abstracted from matter, and that the lines determining this pyramidal/conical configuration were purely mathematical (postulated) rather than physical. Moreover, he refuted the physicists’ theory of vision (as inspired by Aristotle’s Physics and De anima), which ambivalently conjectured that sight results from the “intromission” into the eye of the form of the visible object without its matter when the transparent medium (al-shaff; diaphanes) is actualized by physical illumination. Ibn al-Haytham demonstrated that vision occurs by way of the introduction of light into the eye, while showing that this physical phenomenon was geometrically structured in the shape of a virtual-mathematical cone of vision. Consequently, he distinguished vision from light, and devised novel methodological procedures that brought the certitude and invariance of geometrical demonstration to bear with isomorphism (instead of mere synthesis) on his research in physical optics. He moreover subjected the resultant mathematical-physical models and hypotheses to experimentation by way of controlled empirical procedures of testing, including the devising and use of the camera obscura (al-bayt al-muẓlim). Experimentation, as a notion that appeared in its rudimentary forms in the research of polymaths of the ninth century in medieval Islamic civilization, was known by the appellation: al-īʾtibār (experimentatio). This empirical process was further systematized in novel methodological applications by Ibn al-Haytham in the context of optics, and further refined by al-Fārisī after him. Ibn al-Haytham
did not use experimentation as an element of empirical methodology, rather it was essentially (and theoretically) integral to his proofs, and it granted an apodictic value to his enquiries in optics.\textsuperscript{22} Ibn al-Haytham’s geometrical, physical, physiological, and meteorological studies in optics were also related to his psychology of visual perception and to his analysis of the faculties of judgment and discernment, of cognitive comparative measure, of (eidetic) recognition, imagination, and memory. He thus distinguished the immediate mode of perception by way of glancing, as \textit{idrāk bi-al-badīha} (comprehensio superficialis or comprehensio per aspectum), from contemplative perception, as \textit{idrāk bi-al-ta’ammul} (comprehensio per intuitionem—\textit{Optics}, II.4 [5, 20, 33]).\textsuperscript{23} In reflecting on the manner of perceiving particular visible properties (\textit{al-ma’anī al-mubṣara}; \textit{intentiones visibles—Optics}, II.3 [43–8]),\textsuperscript{24} Ibn al-Haytham made a distinction between \textit{mujarrad al-hiss} (pure sensation), which perceives light \textit{qua} light and color \textit{qua} color, and \textit{al-ma’rifa} (recognition) with the associated \textit{al-tamyīz wa-al-qiyās} (discernment and comparative measure/inference)—the latter perceives properties in the form of a visible object that has been previously seen or remembered, and it involves inference (\textit{qiyās}) in inspecting and discerning (\textit{tamyīz}) the signs of that form (\textit{idrāk bi-al-amārād}; comprehensio per signum—\textit{Optics}, II.3 [50–52], II.4 [22]). Visual perception engages \textit{al-quwwa al-mumayyiza} (\textit{virtus distinctiva}; faculty of discernment), which perceives all the properties (\textit{Optics}, II.3 [1–25]), while being aided by imagination (\textit{al-takhayyul}; \textit{imaginatio}) and memory (\textit{al-dhikr} or \textit{al-tadhakkur}; \textit{rememoratio}), and is usually operative without deliberate or excessive effort (\textit{Optics}, II.4 [12–15, 22]).

Although Ibn al-Haytham noted that pure sensation perceived light \textit{qua} light, and color \textit{qua} color, he did none the less argue that sensation was ultimately effected (psychologically-physiologically) by the last sentient (\textit{al-hās al-akhīr}; \textit{sentiens ultimum}) and not by the eye alone (\textit{Optics}, I.6 [74]), while also basing his conclusions on anatomical (\textit{al-tashrīh}) examinations of the structure of the eye (\textit{fī hay’at al-baßar}; \textit{Optics}, I.5 [1–39]) and furthermore reinforcing them through investigations of binocular vision (\textit{Optics}, I.6 [69–82]).\textsuperscript{25} The image formed on the crystalline (\textit{al-jalūdīyya}) passes through the vitreous (\textit{al-zujājīyya}) to the hollow optic nerve (\textit{al-‘aßaba al-jawfī}), which connects to the common nerve (\textit{al-‘aßaba al-mushtaraka}) as a sensation leading to the last sentient in the anterior part of the brain (\textit{muqaddam al-dimāgh}). Moreover, and in reference to binocular vision, the beholder, under normal circumstances of sight, perceives a single visible object with two sound eyes (\textit{salāmat al-baßarayn}). The form of that single visible object occurs on the surface of the crystalline of each of the eyes. Looking at that object, two of its forms are received, one in each of the eyes. Consequently, two forms, each occurring on the crystalline, pass via the vitreous to the hollow nerves, and (as sensations) they ultimately become unified in the common nerve, thus reaching the last sentient as an ordered single form of a sensible object (\textit{al-ṣūra al-muttaḥida li-al-muṣṣar al-wāḥid}).
The object of vision is seen by way of the introduction into the eye of the light rays that are emitted from the visible and lit surfaces of the seen object, which propagate rectilinearly across the transparent medium that is between the observer and the observed, while the reception of these rays in the eye is structured geometrically in the shape of a virtual visual cone (makhrūṭ al-shuʿāʾ), with its vertex at the center of the eye and its base on the seen and lit surfaces of the visible object (Optics, I.2, I.3). The light rays that are structured within this mathematical model travel from every point on the lit and appearing surfaces of the visible object in a punctiform-corpusecular configuration, with a spherical irradiation that is emitted through transparent media in all directions. This phenomenon reflects also a point-by-point correspondence between each point on the lit and visible surface of the object of vision and each correlative point on its retinal image, which secures the ordering of the visible aspects of the seen object. This is also the case given that only the light rays that meet the outer surface of the crystalline humor (al-ruzūba al-jalīdiyya) perpendicularly are admitted into the eye. As for peripheral visible aspects of objects that fall outside the virtual cone of vision, they may be sensed laterally but not in terms of direct and clear vision. This phenomenon is also analyzed in terms of studying the geometrical properties of the outer surface of the crystalline, which is treated as an optical lens (spherical section), with its analysis relating to Ibn al-Haytham’s studies on spherical aberration that were partly based on Ibn Sahl’s dioptrics (as we have also indicated above).

To illustrate the optical phenomenon of the one-to-one correlation between the points on a lit visible surface and those that correspond with them on its retinal image, let us consider the case of a given point \( A \) on a lit and visible surface \( S \). The light emitted from every point of the lit and visible surface \( S \), as is the case here with point \( A \), would irradiate in a spherical configuration; hence innumerable light-rays are emitted from \( A \) in all directions, and propagate rectilinearly across transparent media. If a transparent medium like air exists between \( A \) and the eye of the observer, then among all the rays that are rectilinearly emitted from \( A \) in all directions, only one is introduced through the outer surface of the crystalline as it meets it perpendicularly. This ray of light then passes through the focal centre of the crystalline, and it correlates point \( A \) on the visible surface \( S \), from which it is emitted, with a corresponding point \( A' \) on the retinal image of this seen surface \( S \). In terms of binocular vision, \( A' \), as the correlative point on the retinal image, which corresponds with the point \( A \) on surface \( S \), would itself be a unified point of two separate impressions made by \( A \) on each of the eyes; hence \( A \) has an impression \( A^{1R} \) on the right eye, and an impression \( A^{1L} \) on the left eye, and both \( A^{1R} \) and \( A^{1L} \) appear as one and the same unified impression \( A' \). Each light ray that causes impressions \( A^{1R} \) and \( A^{1L} \) passes via the crystalline, through the vitreous and up to the hollow nerve of each of the eyes. Both impressions \( A^{1R} \) and \( A^{1L} \) are unified as “sensations” in the common nerve, reaching the last sentient as a single impression \( A' \). Ultimately, the surface \( S \) is seen as
one surface, and not as two or many (namely, under normal conditions of
vision: healthy eyes, adequate illumination, and transparency in the medium
between the observer and the object of vision, optimal distance and position
of observer and observed, suitable size of the visible properties of the seen
entity, and so on).

Colors, the rainbow, and meteorological optics

Light was divided by Ibn al-Haytham in his Rīsāla fī al-ḍaw‘ (Treatise on
Light) into two forms: one that is substantial and is the first light (ḍaw‘ jawharī
awwal), and the other that is accidental and is the second light (ḍaw‘ ‘aradī
thānī; not to be confused with reflected light). Substantial light is emitted
from luminous sources (in themselves), and accidental light is emitted from lit
opaque surfaces that are illuminated by substantial lights radiating on them
from luminous sources (in themselves). Ibn al-Haytham deploys the classical
distinction between forma substantialis (ṣūrā jawharīyya) and forma accidentalis
(ṣūrā ‘aradiyya) in the context of his reform of optics. He thus uses a traditional
vocabulary in a novel methodological and conceptual context, and in support
of his reforming of optics. The division between both types of light played a
central function in terms of his conception of colors as being ontologically/
existentially independent from light, but always accompanying accidental
lights and appearing with them, as well as following the same principles of
rectilinear propagation and spherical irradiation that govern them. Colors
were consequently postulated by him as being objects of geometry as well
as being physical phenomena akin to light, but ontologically separate from it
(Optics, I, 3 [134–9]).

It is worth highlighting that Ibn al-Haytham rejected the Aristotelian theory
of the diaphanes (the transparent medium). After all, Aristotle noted that the
object of vision is the color (khrōma) that is on the surface of objects that are
visible propter (De Anima, 418a 26–31; 422a 14), and is on the surface (epiphaneia)
of the body (Physics 210a 29–31, 210b 4–5). Moreover, the transparent body
(diaphanes), which is invisible (or at least barely visible; De Anima, 418b 26–27)
and is uncolored, would be the milieu receiving colors. Furthermore, light
(phōtos) is conceived as the actualization of that which is transparent (De
Anima, 418a 31–32; 418b 9–11): the more a medium is transparent, the more
it becomes colored by way of its actualization in terms of illumination; color
thus appears as the limit of transparency (eskhatos).

In connection with the question concerning the ontological status of
colors, the investigation of the rainbow (qaws quzah) occupied a focal place
in the history of meteorological optics. Ibn al-Haytham’s thesis that colors
had an existential objective reality that is separate from that of light (I, 3
[134–9]), even though their apparition was always intermixed with lighting
and presupposed illumination, was subsequently rejected by al-Fārisī, who
showed (experimentally and through mathematical means) in his Tanqīh
that: light manifests colors out of itself as a result of the differential aspects of its refraction and reflection when passing from a transparent medium into another \( \text{min shafıf ilā ākhar} \) that has a varying refractory disposition (hence having heterogeneous indexes of refraction). The rainbow appears to observers situated in optimal places when sun rays are refracted and reflected on raindrops resulting from cloud condensations. Two arcs forming concentric color bands of the spectrum of light appear in the sky while being separated by a grayish (subtly obscure) zone.

Al-Fārisī had recourse to experimentation \( (\text{iṭibār}) \) in his explication of the rainbow, while sustaining his analysis in terms of geometric constructs. He deployed a synthetic (artefact) manufactured object (as a large spherical glass vessel filled with water) to experimentally constitute the modeling of a natural phenomenon (a raindrop). Geometry, along with a controlled experimental series, using this model within a camera obscura, and the deployment of measured illuminations, all allowed him to study the phenomenon of the propagation of light (in refraction and reflection). His research in this domain benefited from the investigations in dioptrics of Ibn Sahl and Ibn al-Haytham on the refractive properties of spherical transparent vessels. He was also inspired by Ibn Sina’s meteorological studies and investigations in catoptrics. Al-Fārisī ultimately showed that colors resulted from the formation of two or more images (forms) of light that are projected on a screen (or received by the eye), which are caused by refractions and reflections through a spherical transparent vessel modeling the raindrop. Moreover, while Ibn al-Haytham observed that the speed of light, which is enormous, is none the less finite, al-Fārisī affirmed this proposition, and furthermore argued that the velocity of light was inversely proportional to the optical density of the media it traverses. This perspective on the nature of light allowed him to present a “wave” theory of light that is connected with his explication of colors, and led him to reject the “corpuscular” theory of light that was proposed by Ibn al-Haytham.

Geometrical place

It was not uncommon in the history of scientific ideas in classical Islam that selected problems in theoretical philosophy were solved with the assistance of mathematics. This was the case, for instance, with Abū Sahl Wayjan ibn Rustam al-Qūhī’s (fl. tenth century) geometrical demonstration of the possibility of achieving “an infinite motion in a finite time,” which aimed at contesting Aristotle’s views on this matter as they were delineated in Book VI of the Physics. Moreover, we attest similar endeavors to deploy mathematics in solving selected problems of speculative onto-theology, as was the case with Naṣīr al-Dīn al-Ṭūsī’s use of mathematical combinatorial analysis in explicating the Neo-Platonic ontological-cosmological process of “emanation from the One.” It is in this spirit that Ibn al-Haytham presented his geometrical conception of place as a solution to a long-standing problem that remained
philosophically unresolved, which, to our knowledge, also constituted the first viable attempt to geometrize “place” in the history of science. Ibn al-Haytham aimed to promote a geometrical conception of place that is akin to extension in view of addressing selected mathematical problems that resulted from the unprecedented developments in geometrical transformations (similitude, translation, homothety, and affinity), the introduction of motion in geometry, the anaclastic research in conics, and dioptrics in the Apollonian-Archimedean Arabic legacy, as also shown in the earlier sections of this chapter.\(^{35}\)

Besides the penchant to offer mathematical solutions to problems in theoretical philosophy that were challenged by long-standing historical obstacles and epistemic impasses, Ibn al-Haytham’s remarkable and successful endeavor in geometrizing place was undertaken in view of sustaining and grounding his research in mathematical analysis and synthesis (\(al-\text{-}ta\text{"a}l\text{"a}l\text{-}wa-\text{-}al\text{-}tark\text{"a}b\)),\(^{36}\) and in response to the needs associated with the unfurling of his studies on knowable mathematical entities (\(al\text{-}ma\text{"a}l\text{"u}m\text{"a}t\)), and in order to reorganize most of the notions of geometry and rethink them anew in terms of motion.\(^{37}\) Consequently, he had to critically reassess the dominant philosophical conceptions of place in his age, which were encumbered by inconclusive theoretical disputes that were principally developed in response to Aristotle’s Physics.\(^{38}\) So, in his \textit{Qawl f\text{"i} al\text{-}mak\text{"a}n} (Discourse on Place)\(^{39}\) Ibn al-Haytham presented his mathematical refutation of the Aristotelian physical conception of \textit{topos} as “enveloping surface.”

Even though Aristotle affirmed that \textit{topos} has the three dimensions of length, width, and depth (\textit{Physics, IV}, 209a 5), he rejected the theories that posited place as being the form (\textit{eidos}), the matter (\textit{hulê}) or the interval (\textit{diastêma}) between the extremities of the body that it contains (\textit{Physics, IV}, 212a 3–5). He ultimately defined \textit{topos} as: “the innermost primary surface-boundary of the containing body that is at rest, and is in contact with the outermost surface of the mobile contained body” (\textit{Physics, IV}, 212a 20–21). Based on this thesis, one would add that a place could be grasped as a \textit{vessel} that is immovable. Moreover, when something moves inside another that is also in motion, like a boat in a river, it uses the containing body as a \textit{vessel}, while the river basin acts as the motionless place (\textit{Physics, IV}, 212a 15–20)—“A place is together with the [contained] thing, since the \textit{limit} [of that which contains] coincides with that which is \textit{limited}” (\textit{Physics, IV}, 212a 29–30); and this is the case given that the inner boundary of a containing body coincides with the shape of the container.

\textit{Topos}, as “the inner surface of the containing body that is in contact with the outer surface of what it contains,” is an enveloping surface of containment, which resulted in the grasp of \textit{al\text{-}mak\text{"a}n} by “Aristotelian” physicists in classical Islam as a \textit{s\text{"a}th m\text{"u}h\text{"i}t} or \textit{s\text{"a}th h\text{"a}w\text{"i}} (surrounding or containing surface). This definition refers principally to what we may call a “\textit{local place},” which is the \textit{specific containing body} that a given thing occupies, in contrast with the “\textit{cosmic qua natural place},” namely, the one toward which things tend to go back to due to their own nature (\textit{phusei}) if not prevented from doing so; as heavy bodies
travel by their nature downwards toward the Earth in a fall in the direction of the center of the Universe (kosmos), or light bodies travel by their nature upwards toward the heavens (Physics, IV, 4, 212a24).

In contesting the long-standing Aristotelian physical conception of topos (specifically in its “local” containment sense), Ibn al-Haytham posited al-makån as an imagined void (khalå mutakhayyal; postulated void) whose existence is secured in the imagination, like it is the case with invariable geometrical entities. He moreover held that the “imagined void” qua “geometrized place” consisted of imagined immaterial distances that are between the opposite points of the surfaces surrounding it (al-ab°åd al-mutakhayala al-latå lã måda fåhå, al-latå hiya bayna al-nuqaç al-mutaqåbila min al-sañ° al-mu°íñ, al-latå hiya bayna al-nuqåt al-mutaqåbila min al-sañ° al-mu°íñ). He furthermore noted that the imagined distances of a given body, and those of its containing place, get superposed and united in such a way that they become the same distances (qua dimensions) as mathematical lines having lengths without widths/breadths. Consequently, it is worth noting in this regard that Ibn al-Haytham’s geometrization of place was “ontologically” neutral. This is the case given that his mathematical notion of al-makån was not simply obtained through a “theory of abstraction” as such, nor was it derived by way of a “doctrine of forms,” nor was it grasped as being the (phenomenal) “object” of “immediate experience” or “common sense.” It is rather the case that his geometrized place resulted from a mathematical isometric “bijection” function between two sets of relations or distances. Nothing is thus retained of the properties of a body other than extension, which consists of mathematical distances that underlie the geometrical and formal conception of place. Accordingly, the makån of a given object is a “region of extension that is defined by the distances between its points, on which the distances of that object can be applied bijectively.”

To give an example of Ibn al-Haytham’s mathematical refutation of Aristotle’s physical definition of topos, we could consider the case of his geometric demonstration based on the properties of a parallelepiped (mutawåzï al-su°ûå; namely, a geometric solid bound by six parallelograms). If this given parallelepiped were to be divided by a rectilinear plane that is parallel to one of its surfaces, and is then recomposed, the cumulative size of its parts would be equal to its magnitude prior to being divided, while the total sum of the surface areas of its parts would be greater than its surface-area prior to being partitioned. Following the Aristotelian definition of topos, and in reference to this divided parallelepiped, one would conclude that an object divided into two parts occupies a place that is larger than the one it occupied prior to its division. Hence, the place of a given body increases, while that body does not (makån al-jism ya’zîm wa-al-jism lam ya’zîm); consequently, an object of a given magnitude is contained in unequal places, which is an untenable proposition. Likewise, if we consider the case of a parallelepiped that is carved, then its bodily magnitude is diminished while the total sum of its surface area would increase. Following the Aristotelian definition of topos, and in reference to this carved parallelepiped, one would
conclude that: an object that diminishes in magnitude occupies a larger place, which is untenable.

Moreover, using mathematical demonstrations, in terms of geometrical solids of equal surface areas, and figures that have equal perimeters, Ibn al-Haytham showed that the sphere is the largest in (volumetric) size with respect to all other primary solids that have equal surface-areas \( (al-kura\ a’zam\ al-ashkål\ al-latî\ ihîlatuhå\ mutasåwiya) \). So, if a given sphere has the same surface area as a given cylinder, they occupy equal places according to Aristotle, and yet the sphere would have a larger (volumetric) magnitude than the cylinder; hence unequal objects occupy equal places, which is not the case.

Ultimately, Ibn al-Haytham’s critique of Aristotle’s definition of topos, and his own geometrical positing of \( al-makån \) as an “imagined void” \( (khalå’\ mutakhayyal) \), both substituted the grasping of the body as being a totality bound by physical surfaces to construing it as a set of mathematical points that are joined by geometrical line-segments. Hence, the qualities of a body are posited as an extension that consists of mathematical lines, which are invariable in magnitude and position, and that connect points within a region of the three-dimensional space independently of the physical body.

The geometrical place of a given object is posited as a “metric” of a region of the so-called “Euclidean” \( qua \) “geometrical space,” which is occupied by a given body that is in its turn also conceived extensionally, and corresponds with its geometrical place by way of “isometric bijection.” Consequently, Ibn al-Haytham’s geometrization of place points to what was later embodied in the conception of the “antiority of spatiality” over the demarcation of a metric of its regions by means of mathematical lines and points, as explicitly implied by the notion of a “Cartesian space.” The scientific and mathematical significance of the geometrization of place was confirmed in the maturation of mathematics and science in the seventeenth-century conceptions of place as extension (as a volumetric, three-dimensional, uniform, isotropic, and homogeneous space), particularly in reference to the works of Descartes (on extensio) and Leibniz (analysis situs).

There is no doubt that the maturation of Euclidean geometry and its prolongations benefited immensely from the geometrization of place, which among other developments resulted in the emergence of what came to be known in periods following Ibn al-Haytham’s age as being a “Euclidean space”: namely, an appellation that is coined in relatively modern times, and describes a notion that is historically posterior to the geometry of figures as embodied in Euclid’s Stoikheia (The Elements; Kitåb Uqlídis fî al-Usûl). After all, the expression deployed by Euclid that is closest to a notion of “space” as expressed in the Greek term \( khôrâ \), is the appellation \( khôrion \), which designates “an area enclosed within the perimeter of a specific geometric abstract figure”—as noted, for instance, in Euclid’s Data (Dedomena; al-Mu’tayât) Prop. 55 (related to: Elements, VI, Prop. 25): “if an area \( [khôrion] \) be given in form and in magnitude, its sides will also be given in magnitude.”
While Ibn al-Haytham’s geometrization of place corresponds with later developments in history of science and mathematics, one of the principal last attempts (rather “unsuccessful”) on the part of physicist-philosophers in medieval Islamic civilization to rescue Aristotle’s definition of topos is encountered in the “refutation of Ibn al-Haytham’s makân” by ‘Abd al-Laţīf al-Baghdādī (in his fourteenth-century treatise Fi al-radd ‘alâ Ibn al-Haytham fi al-makân [A refutation of Ibn al-Haytham’s place]).

Although Ibn al-Haytham’s Optics influenced theories of vision and perspectivae in European scholarship up to the seventeenth century, there is no documented evidence that his geometrization of place had a wider reception beyond the history of scientific ideas in Islam. However, his geometrical conception of place as space qua extension corresponded with his affirmation of the visibility of spatial depth in the Optics, which also displayed a coherent and rigorous eschewing of the Aristotelian definition of topos.

Ibn al-Haytham’s reflections on the notion of space in his Kitâb al-manâzîr (Optics) were commensurable with his mathematical conception of place in his Qawl fi al-makân (Discourse on Place), which also carried resonances with the epistemic evolution of Renaissance and Early-Modern conceptions of spatiality and extendedness. The definition of place as “space,” rather than grasping it as an “enveloping surface,” corresponded also with the manner in which architecture and perspective shared a sense of coherent spatiality as embodied in the notion of the “room.” This “idealized representation” acquired in the history of its conceptual development the characteristics of the “isotropic space of geometry” that was perhaps “anticipated” in the “perspectivity” of architecture with the “parallelism” of its structuring components (columns, pillars, walls) and the “axial regularity” of its spatial articulations, which ultimately integrated the impetus of geometry and optics within the structuring of the pictorial order and its relatable forms of organizing space.

Notes


4 This is particularly the case with Pelacani’s Quaestiones perspectivae. See Biagio Pelacani, Quaestiones perspectivae, ed. Graziella Federici Vescovini (Paris: Vrin, 2002).


11 This refers to the research of Abū ‘Abd’Allāh al-Mahānī (fl. 9th cent. CE) and Abū Ja’far al-Khāzin (fl. 10th cent. CE) in rendering geometrical problems into algebraic equations, based on al-Khwārizmī’s algebra, or the innovative classification of cubic equations with geometric solutions through intersections of conics. For further insights into these traditions in mathematical research, see Roshdi Rashed, Les mathématiques infinitésimales du IXe au Xle, vol. III, Ibn al-Haytham. Théories des coniques, constructions géométriques et géométrie pratique (London: al-Furqân Islamic Heritage Foundation, 2000); ibid., vol. IV, Méthodes géométriques, transformations ponctuelles et philosophie des mathématiques (London: al-Furqân Islamic Heritage Foundation, 2002), and Roshdi Rashed, Œuvre


15 For references to studies in dioptrics (Arabic critical editions and annotated English translations with commentaries), see Rashed, Geometry and Dioptrics in Classical Islam, as follows: Ibn Sahl’s research on the parabolic and ellipsoidal mirrors, on plano-convex and biconvex lenses in Kitāb al-harrāqāt (Burning Instruments), 73–143; Ibn al-Haytham, al-Kāsir al-kurī (The Spherical Dioptre; Optics Book VII), 184–215; Ibn al-Haytham, The Spherical Lens, 216–23, and his Treatise on the Burning Sphere, 224–55, with al-Fārisī’s commentaries, 256–93.

16 Spherical aberration occurs when beams of light, which are parallel to the axis of the lens (as a spherical section) yet also vary in terms of their distance from it, become focused in different places, which results in the blurring of the resultant image.

17 For references to mathematical studies on scientific instruments (Arabic critical editions and annotated English translations with commentaries), see Rashed, Geometry and Dioptrics in Classical Islam, as follows: Al-Qūhí’s research, 726–97; al-Sijzi’s, 798–807, with commentaries from Kamāl al-Dīn ibn Yūnus and Athīr al-Dīn al-Abharī on the perfect compass (al-birkār al-tāmm) as a compass of conics (birkār al-makhfrāḍ); see also al-Qūhí’s study on the astrolabe, 878–939, and Ibn Sahl’s commentary on 940–67.


22 Rashed, Geometry and Dioptrics in Classical Islam, 181.

23 Subsequent references to Ibn al-Haytham’s Optics in the body of the text indicate the numbering of the book with its sections/chapters.


27 Rashed, Discours de la lumière (Optique et mathématique, ch. V), 198.

28 This Aristotelian conception of colors and transparencies seems to correspond with the definition of topos in Book Delta of the Physics, which was refuted by Ibn al-Haytham in his Treatise on Place (Qawl fi al-makån). See Ibn al-Haytham, Qawl fi al-makån (Traité sur le lieu), Arabic critical edition and annotated French translation, in Roshdi Rashed, Les mathématiques infinitésimales du IXe au XIe siècle, vol. IV (London: al-Furqan Islamic Heritage Foundation, 2002), 666–85.


31 Ibid., 340–42. We find parallels with De iride et radialibus impressionibus of Theodoricus Teutonicus, ed. J. Würschmidt, in Beiträge zur Geschichte der Philosophie des Mittelalters XII:5–6 (1914).


The Arabic critical edition (based on four mss.) and the annotated French translation of this treatise (Fi al-tahîl wa-al-tarkîb; L’Analyse et la synthèse) are established in Rashed, Les mathématiques infinitésimales, vol. IV (2002), 230–391.


The Arabic critical edition (based on five mss.) and annotated French translation of this treatise (Fi al-makåän; Traité sur le lieu) are established in Rashed, Les mathématiques infinitésimales, vol. IV (2002), 666–85. See also note 28 above.

Ibid., 669.

“Bijection” refers to an equivalence relation or function of mathematical transformation that is both an “injection” (“one-to-one” correspondence) and “surjection” (also designated in mathematical terms as onto) between two sets.


Ibid., 670–73.


Ibid., vol. IV, 661–2.


The Arabic edition (based on one manuscript) and annotated French translation of this treatise (Fi al-radd ‘alâ Ibn al-Haytham fi al-makåän; La réfutation du lieu d’Ibn al-Haytham) are established in Rashed, Les mathématiques infinitésimales, vol. IV (2002), 908–53.

Meanings of perspective in the Renaissance: Tensions and resolution

Charles H. Carman

Differing views

Single point perspective construction, codified by Alberti in his book *On Painting* of 1435, has engendered opposing interpretations: (a) that it seeks relatively successfully to depict the way we see, or (b) that perspective is not so much an attempt at accurate representation of physical vision as it is a way to establish significance beyond the evident sense certainty of sight. The former approach rejects philosophical interpretation, and the latter interrogates perspective’s geometric/mathematical basis for evidence of higher conceptual, even symbolic meaning. The following are but a few examples that typify these approaches.

Martin Kemp, in his 1978 article “Science, Non-science and Nonsense: The Interpretation of Brunelleschi’s Perspective,” characterizes these latter approaches as “poetically beautiful” or “intellectually brilliant,” but none the less, having “no place in historical analysis.” Less polemical but equally exclusive is Kim Veltman’s “Panofsky’s Perspective: A Half Century Later” from 1980—an essay about the famous treatise “Perspective as Symbolic Form” of 1924–25. Within this discussion of Panofsky’s sources, his influences, and how later historians interpreted the physical particulars of perspective construction, there is no mention of Panofsky’s central idea of “symbolic form.” Unlike Kemp, Veltman avoids altogether the issue of meaning.

Samuel Edgerton, on the other hand, in *The Heritage of Giotto’s Geometry* from 1991, argues for meaning in Albertian perspective beyond that of technical advance. The incorporation of a geometry of space over the flatness of medieval non-space, as in Masaccio’s *Trinity* (Santa Maria Novella, Florence, 1426), signals that it “not only replicates human vision but reveals the actual process of God’s divine grace working on earth.” In a similar vein, S. K. Heninger, Jr. has suggested in his *Proportion Poetical* of 1994 that proportion in the mathematics and geometry of space in painting, in architecture, and in the construction of literary forms participates in culturally shared
“tension between the logocentric and the hylocentric imperatives.” That is, proportionality reflects the “subtext” of divine order underlying, and otherwise empirically not evident in, God’s physical creation. Even more clearly than Edgerton, Heninger posits that mathematics and geometry are used to enliven a dialectic of sense and intellect that pervades the literary and visual arts of late medieval and Renaissance culture.

Beyond these two fairly distinct points of view, there emerges a third tendency. It is a sort of compromise position that sees meaning in perspective, but like the first approach, links it primarily with the drive for technological advance that is often seen as central to what distinguishes Renaissance humanism and its new concern with the physical world, including the greater naturalism evident in the visual arts. Karsten Harries, for example, in his *Infinity and Perspective* (2001), contrasts Alberti’s perspective with the spiritual significance of the gold background in medieval art. He concludes that Alberti:

invites us to look through the material painting as if it were transparent, a window through which we can see what the painter has chosen to represent. But this is very much a human perspective, which has its center in the observer: what we see is appearance for us. The spiritual perspective of medieval art would have us look through the painting in a very different sense: through the material to its spiritual significance. The mundane is transformed into a divine sign. Alberti’s art is incompatible with this spiritual perspective. A God-centered art gives way to a human-centered art.6

In another recent work, Anthony Grafton’s *Leon Battista Alberti: Master Builder of the Italian Renaissance* (2000), emphasis is placed on Alberti’s relationship to technical advance, namely Brunelleschi’s perspective experiments. Like Harries, Grafton acknowledges Alberti’s humanist ties and claims that he creates “a realistic illusion of three dimensions in two—having defined producing illusions as the artist’s continual task.”7 Assuming that Alberti’s humanism asks the painter to aim at something in addition to, or other than, illusionism, these notions of creating ever more worldly and realistic images suppress theological interpretation, eliding the relationship between underlying purpose and technical aspects of constructing a painting.

Where the first tendency avoids or demeans interpretation of perspective, and the second attempts to explore how to contextualize its religious implications, the third seems to edge toward seeing the value in perspective as a reflection of a proto-modern secularism. Inherent in both the first and third approaches is a tension between the religious nature of medieval and early Renaissance humanism and its appropriately noted concern with physical reality as manifest in technical concerns and in painting’s new naturalism. The problem, it seems to me, is that neither approach sees the introduction of this new technology (if that is what it is) as having any metaphorical function. Why, we ask, cannot it be a new way to understand the overarching importance of the spiritual, heavenly realm, as indeed some scholars have inquired?

Panofsky, in his famous essay “Perspective as Symbolic Form,”8 seems to have launched the modern tendency to find space symbolic. Yet, ironically,
he also may have been the source of later, divergent points of view. For example, at one point he perceives that Renaissance perspective can convey simultaneously understanding of the earthly and the divine: “the result was the concept of an infinity not only prefigured in God, but indeed actually embodied in empirical reality.” Subsequently, however, he also seems to perceive ambiguity, wherein one aspect of the relationship (finite/infinite) may seem reduced by the other:

whether one reproaches perspective for evaporating “true being” into a mere manifestation of seen things, or rather for anchoring the spiritual idea of form to a manifestation of mere seen things, is in the end little more than a question of emphasis.

Where earlier he seemed to see a balance, now the spiritual becomes “mere” seen matter, its essence “evaporating.” Finally, he concludes that this new space is “the sign of a beginning, when modern ‘anthropocracy’ first reared itself.”

My goal here is to explore ways of resolving this tension between divergent understandings of perspective, which has continued since Panofsky, the gap between one approach and another widening into fixed opposing positions. I believe, along with others, that one can see the inception of Renaissance perspective in terms of the divine embodied in empirical reality, and that it is not yet the beginning of an anthropocentric view. To do this we need to look at an earthly/divine dynamic within the context of Alberti’s text itself, as few have done, including Panofsky. Moreover, we might seek evidence of a broader, shared epistemology of vision, found, for example, in the writings of Cardinal Nicholas of Cusa, which may help us think about how Albertian perspective functions to reveal meaning within notable examples of Renaissance painting.

**Alberti’s On Painting**

But first Alberti: at the very beginning of *On Painting* he declares that he will utilize the knowledge of mathematicians to “enlarge on the art of painting from its first principles in nature.” He explains, for example, that:

Mathematicians measure with their minds alone the forms of things separated from all matter. Since we wish the object to be seen we will use a more sensate wisdom.

Minerva, or “wisdom,” is invoked to identify the role of mathematical/geometrical principles that will constitute the framework for what contains naturally appearing forms.
The geometry of single point construction, “associated with first principles in nature,” seems to represent both what we see in nature and higher qualities of wisdom. To understand this duality, we need to distinguish between how perspective functions in a painting and how we see in the experience of viewing nature. On the one hand, when looking at a single point perspective painting from various angles, its morphology is relatively consistent. On the other hand, in real space, our angle of vision is constantly shifting, whether standing still or moving as we view the relationship of objects in the field of vision. Put another way, geometric order found in space is best perceived from one angle of vision. Yet, when looking at a single point construction, we see the same angle from virtually every position.

Consequently, the experience of a consistent geometric spatial morphology is what Alberti ties to wisdom, a quality of mind that is associated, moreover, with the infinite, in as much as the apex of the pyramid of perspective is defined as receding to infinity: “as if to infinity” (“quasi per sino in infinito”) (Figure 1, pyramids of perspective and vision). Concomitantly, it is important to understand that in a contemporary work this infinity is associated not only with “principles of nature,” but subsequently with God’s nature, or nature as God. In his Libri della Famiglia (1434), for example, Alberti states that “Nature, that is God, made man” (“Fece la natura, cioè Iddio, l’uomo”). This brings into direct alignment God and Alberti’s association of mathematics (his geometry of perspective) and “first principles of nature”: geometry reflects God’s nature, and by association His “wisdom,” which, inherited from God, can allow mankind to attain some level of understanding of divine origin.

It seems clear that Alberti’s conception of the role of mathematics and geometry associated with the fundamentals of nature is inextricably tied to an inherited notion of God inhering in nature, an association that he consistently bears in mind. Following his description in Book One of how to construct a painting—from point, line, surface, and solid to the use of light and color—all within the idealized geometric space, Alberti goes on in Book Two to contextualize painting as containing “a divine force … most useful to that piety which joins us to the gods and keeps our souls full of religion” (“Tiene in sé la pittura forza divina … che la pittura molto così giova ad quella pietà per quale siamo congiunti alli iddii inseime et a tenere li animi nostri pieni di religione”).

Thus, Minerva’s wisdom acquires a more specifically theological context within the text itself. It is one, moreover, that is to be articulated also by his notion of istoria: “the greatest work of the painter.” Istoria, he says, is that “divine force” which we are to think of as the moralizing content of what is being made legible by the carefully worked out composition and the action of the figures. Indeed, istoria not only holds “our soul full of religion,” it:

merits both praise and admiration [and] will be so agreeably and pleasantly attractive that it will capture the eye of whatever learned or unlearned person is looking at it and move his soul.
Sarà la storia qual tu possa lodare et meravigliare tale che con sue piacevolezze si porgierà si ornate et grata che ella terrà con diletto et movimento d’animo qualunque dotto o indotto la miri.\textsuperscript{23}

Just as the geometric space seems real, yet urges a higher seeing (wisdom), so the story is to resemble what we see in life and at the same time aid in generating interpretation through its artificial/rhetorical organization of position, posture, gesture, and expression—its \textit{istoria}. Seduced by the realm of empirical sense certainty, simultaneously we are lured beyond to confront the implications of clearly articulated ideals that comprise the work’s subject matter, which inevitably is religious in nature, at least as it is evident in Renaissance paintings that employ single point perspective.\textsuperscript{24} One need only recall some obvious examples, such as Masaccio’s \textit{Trinity} (mentioned above) and \textit{Tribute Money} (Brancacci Chapel in Santa Maria del Carmine, Florence) of the early fifteenth century,\textsuperscript{25} Leonardo’s \textit{Last Supper} (refectory of Santa Maria delle Grazie, Milan) of the late century, and Raphael’s \textit{Disputà}, along with his \textit{School of Athens} (Stanza della Segnatura, Vatican) of the early sixteenth century.

Following the Minerva reference, the subsequent instructions for creation of perspective in Book One, together with the concept of \textit{istoria} in Book Two, Alberti introduces a second classical figure, that of Narcissus. Appearing in the early stages of Book Two, he becomes the focal point for grasping art, much as Minerva was at the beginning of Book One. As a counterpart to Minerva, we confront Narcissus somewhat startlingly as “the inventor of painting.” Generally, the tendency has been to take this passage literally, therefore implying that painting was born of an existential crisis of self-love. Clearly, this serves the interests that see a modern anthropocentric tendency manifest in Renaissance naturalism—an immersion in the material world together with the attendant crisis of self-realization and consequent artistic creativity.

This is, however, problematic, simply for its implication that Alberti would believe painting originated from the errors of sense perception.\textsuperscript{26}
What happens, we need to ask, to the already established association of painting with Minerva’s wisdom, and the *istoria* with its moral and traditional Christian religious values? Why, moreover, would Alberti have ignored the enduring tradition of Ovid’s moralizing story? Part of the difficulty in understanding this passage resides to some extent in the persistent force of secularizing interpretations of Renaissance art, which make it easier to lend a modern inflection to Alberti’s use of Narcissus. Yet if we re-examine his words, what emerges is not so much a surprise as an ironic and paradoxical intent that encourages an interpretation consistent with what we have heretofore granted.

According to the English translation (Spencer), Alberti says:

> I say among my friends that Narcissus who was changed into a flower, according to the poets, was the inventor of painting. Since painting is already the flower of every art, the story of Narcissus in most to the point. What else can you call painting but a similar embracing with art of what is presented on the surface of the water in the fountain.

Narcissus is equated with the invention of painting by putting the transformation to a flower in a subordinate clause, “who was changed.” If we look at the original Latin and Italian, however, and consider the fuller context of this quote and a bit of its surrounding text, a different emphasis can be discerned. In the original Latin, rather than relegating the transformation to a subordinate clause, its importance is grammatically fore-grounded:

> Quae cum ita sint, consuevi inter familiares dicere picturae inventorem fuisse, poetarum sententia, Narcissum illum qui sit in florem versus, nam cum sit omnium artium flos pictura, tum de Narcisso omnis fabula pulchre ad rem ipsam perapta erit. Quid est enim aliud pingere quam arte superficiem illam fontis amplecti?^{27}

Using indirect discourse Alberti links the subject accusative *inventorem*, inventor, with *Narcissum illum*, “that Narcissus” and *florem*, the flower into which he has been transformed, *sit versus*. In the Italian version:

> Però usai di dire tra i miei amici, secondo la sentenzia de poeti, quel Narcisso convertito in fiore essere della pittura stato inventore: che già, ove sia la pittura fiore d’ogni arte, ivi tutta la storia di Narcisso viene a proposito. Che dirai tu essere dipigniere, altra cosa che simile abbracciare con arte quella ivi superficie del fonte?^{28}

Here, a demonstrative pronoun, “that” (*quel*), emphasizes the subject *Narcisso* together with his transformation, his *convertito*, preserving the relationship of the inventor of painting with Narcissus’s conversion into a flower.

My point is that the emphasis is not so much on the inventor as Narcissus as it is on conversion, even the power of conversion, which a flower represents. Though much more surrounds these passages to suggest such an emphasis, particularly the notion of the flower itself as a metaphor of beauty
and transformation, suffice it to add that Alberti brings the entire concept to conclusion in the later part of the passage with the question, “what else can you call painting but a similar embracing with art of what is presented on the surface of the water in the fountain?” This, a faithful translation of the originals, can now be judged to fulfill the idea that it is not by mere unaided sight, but “with art,” con arte in Italian, or simply arte, the ablative “with or by art” in Latin, that the painter or viewer embrace what is seen. We are not to fall into Narcissus’s trap. Like the painter, we use our più grassa Minerva, our “more sensate wisdom.” The viewer uses art, a creative, transforming perception of mind, to understand what is seen.

It is not only the role of perspective, then, but much else in Alberti’s text that traditional readings have skewed toward literal interpretation of what appears natural, thus contributing to either a perpetual separation of the real from the ideal, or at least to an unresolved tension between them. Yet there is, as I have suggested, much that militates against this. As Panofsky first implied, but did not pursue, perspective as an infinite is perceived to be in the finite. God as nature is the world that we see and experience. And if Minerva is a clue to what higher role there is in “seeing”—that perception and the acquisition of wisdom that leads one’s sense upward—Narcissus, then, provides the perfect counter to the danger of immersion in sense certainty. Indeed, his surprising, seemingly paradoxical and certainly ironic presence provides the strategic, poignant nudge to see beyond the inevitable post-lapsarian doom of being trapped by physical temptation. Surely Alberti understood, as did Sigmund Freud later, that he, his painter, and the viewing public were all prone to be like Narcissus. But for Alberti, unlike the post-Enlightenment world, that recognition required a means for elevating one’s vision toward a spiritually transformative experience.

It is not the image in the fountain that is meant as the purpose of the painting’s reflection of life. It is the transformation, the metamorphosis that is recognized as essential to fulfill the search for meaning—a meaning that is found in the literal and metaphorical beauty of the flower.

Nicholas of Cusa: A parallel epistemology of vision

What really matters, I think, in the relationship of viewer to single point perspective image as Alberti unfolds it, is the apparent paradox of conflating incommensurables, and the simple insistence that such a relationship is appropriate. This is a view, moreover, that is fundamental to the contemporary Renaissance Christian’s understanding of his or her relationship to God, and one famously conveyed by Nicholas of Cusa. In his early work On Learned Ignorance (1440), he solicits his reader, for example, to try and extrapolate beyond the known properties of a sphere and ascend to consider an infinite sphere—a metaphor for God—where a sphere’s properties of measurement disappear, its center now everywhere and its circumference nowhere.
He suggests that based upon a finite sphere, we “conjecture” an infinite sphere—that is, we form provisional notions about an infinite sphere. And in a related fashion, we may understand that the finite form can be seen as a “contracted” infinite one, aiding in the process of conjecturing the ultimately unknowable one. In other words, we can intellectually conceive of a merging or coincidence of the opposites, finite and infinite. Cusa’s heuristic model of a finite sphere, which can be conceptually transmuted into an infinite one, is somewhat like Alberti’s notion of converting a triangle (pyramid of vision) into a pyramid of space (pyramid of perspective) (Figure 1), whereupon the lines receding to a point take on the appearance of a receding pyramid. Triangle becomes pyramid, and by imagination becomes open, infinite space. He too creates a “coincidence of opposites.” Like that of Cusa, Alberti’s geometry doubles as an empirically real finite phenomenon and as an imagined infinite. One should not get stuck on seeing only what corresponds to phenomenal spatial experience, but must choose, and I think is asked to conceive, to conjecture this infinite in the painting as what is called “the divine force.” Similar to Cusa, the geometrical spatial construction of Alberti serves as a concrete visible stimulus to seek understanding vis-à-vis one’s own creative mental powers—powers which indeed inhere as a function of the Christian imago dei.

Furthermore, Cusa reuses his example of God as an infinite sphere in his later work On the Vision of God (1453), and he does so in a fashion that bears more closely on the way Alberti’s geometric perspective functions to assist in imparting meaning. Here Cusa’s context for grasping the coincidence of opposites is the experience of viewing a painting, an icon of God whose eyes, as if radiating from an infinite sphere, see simultaneously from every angle at once all viewers in the room. Clearly intended for the viewing monks to grasp how one might move from sense experience to higher intellectual understanding of God’s nature, Cusa in effect has utilized the same coincidence of opposites that we find in a single point spatial construction. As I have argued elsewhere, this phenomenon of Christ’s omnivoyance functions like the orthogonal lines of Alberti’s perspectival pyramid, which, like God’s rays of vision, follow any and all observers no matter their position. And so, like Cusa’s eyes of God, the single point space of a painting seems to look back at our looking; its rays of sight also seem ubiquitous, omnipresent, and omnivoyant.

I am suggesting that both thinkers have a similar conception of how to view the world, or nature. On the one hand, sight is physical, and on the other, it is conceptual. The former vision is conditioned by physiology and is limited by the finite human condition. The latter is contingent upon an intellectual, interpretive faculty that allows understanding of the sense experienced world to rise to its highest level, which still for Alberti’s era resides in a conception of the Creator. In order to illustrate further the similarities in their notions of this dialectical, twofold vision, I want to think about Cusa’s diagrammatic illustration, his “Figura Paradigmatica,” or “P” (Figure 2) from his treatise On Conjecture (1440), with diagrams of what Alberti’s pyramids of vision and perspective might look like.
In Cusa’s diagram, pyramids emanate from bases at opposite ends of reality. Beginning at the left, in the world of Oneness, or God, the base of a pyramid of light proceeds toward its apex in the world of Otherness, or multiplicity in physical Creation—our world. From the perfection of unity, light is increasingly diminished toward the base of the opposite pyramid, which itself commences from the darkness of mankind’s existence to culminate at a point on the base of Oneness. At each extreme, correspondingly diminishing or increasing gradations of light and dark indicate the degrees of oneness/perfection and multiplicity/imperfection. Cusa’s point is to represent conjectural understanding of what he believes to be simultaneously God’s participation in His creation and human creative intellect availing itself of God’s presence.

Now, let us consider how a diagram of Alberti’s perspective may similarly convey a mutual interpenetrating of Heaven and Earth. In its most rudimentary form, we figured it (Figure 1) as two pyramids with apexes $a$ and $b$ and a common base in $S$, the surface of the painting. Pyramid $aS$ is the pyramid of perspective with its apex at infinity, and $bS$ the pyramid of vision with its apex in the finite world of human seeing. Though the relationship of pyramids is simpler than in Cusa’s design, can we not imagine how the concept embodied here might be viewed as similar to that of Cusa? At a very simple level, we know that the painting $S$ reflects both a real and an ideal world, which the similar triangles can be understood to represent. Thus the painted single point perspective construction on $S$ and the istoria it contains reflect a Cusan-like reciprocity of unity and multiplicity, or ideal and real.

Moreover, can we also imagine extending this schema to more fully express the intellectual implications of these geometries—perhaps an idea Cusa could have had? (I should say parenthetically that many scholars have assumed Cusa knew Alberti’s text, though proof of such knowledge has not been found.\textsuperscript{3}) Nevertheless, the circumstantial evidence is intriguing and stimulates me to the following hypothetical construct (Figure 3). First, let us continue the dotted lines $b1$ and $b2$ from the apex emanating from the eye of the painter/viewer at $b$. In this way, the base of the extended pyramid at $Sa$ becomes the subject at an infinite distance that is represented by Alberti’s “window” or “veil” as it intersects the visual pyramid at $S$. Correspondingly, let us continue the dotted lines $a1$ and $a2$ from the apex at $a$ so that $S$ may also be construed as the window, which from a God’s eye view reveals the world $Sb$. The painting at $S$, that is,
functions as a kind of liminal juncture—one way for humanity to see God and the other way as a portal to show how God “looks” back, or perhaps more accurately unfolds his luminous infinity into creation.

Rethinking Cusa’s actual schema (Figure 2) from this perspective, it is clear that he indicates flow in a similar fashion: just as God’s pyramid of light descends into mankind’s world from base to apex, so it also ascends from its apex to the opposite base. Likewise, mankind’s world of darkness, multiplicity, and so on both descends to the apex in God’s world and ascends from a point in human vision to the base in God’s world. There is the same reciprocal ascending and descending that completes the ideal of Alberti’s perspectives. The only apparent difference in our hypothetical Cusan interpretation of Alberti is the locus of interchange as the surface of the painting that serves to set such a dialectic of finite/infinite in motion.

Both diagrams posit a complex of reciprocal seeing that is based in a notion of the divine as visible, or more accurately as understood (glimpsed) through things visible. Recalling again some well-known examples of the Albertian construction—Masaccio’s Trinity and Tribute Money, Leonardo’s Last Supper, and Raphael’s Disputà—it is clear that penetration of the surface seems both sensuously real as recession to a point and intellectually understood as infinite homologous space. Viewing any of the above-mentioned paintings may constitute a paradigmatic nature of the actual use and therefore effective emphasis of how this perspective functions to elucidate symbolic meaning. In each case, the point of convergence locates a critical focus as divine presence—Christ’s head in Masaccio’s Tribute Money, and Leonardo’s Last Supper, or the Eucharist in Raphael’s Disputà. Like Cusa’s construction in his Vision of God, the form emanating to or from the point of convergence in the paintings follows the viewer affirming its efficacy in establishing God’s all-knowing/seeing presence. We might also marvel at the consciousness-expanding effect of realizing that what seems, as it were, within reach—a seeming extension of the viewer’s world—is by definition at an infinite distance.
Conclusion

The laws of geometry and theology cooperate to assert an apparent paradox where finite and infinite coincide: our senses tell us that what was understood as the infinite God, or His infinite manifestation, is directly within our reach, while our intellect, and surely the contemporary viewer’s faith, offer the understanding that it is at an infinite distance. And while our contemporary (modern/post-modern) sense of reason and intellect may tend to rationalize the presentation of religious subject matter, the Albertian/Cusan viewer would accept the paradox and seek ways to perceive how God’s infinite creative nature flows into the created world, so that human perception may find a reciprocal path back to its origins. This is what the diagrams may help to clarify, but the more powerfully affective image is always the painting.

Albertian-inspired paintings, like Cusa’s icon and diagram, construe the nature of reality, or perhaps the reality of nature, not as a separation of finite and infinite, as much modern criticism implies, but as interrelated. Dialectical tension replaces irresolvable tension, but only if we understand that Alberti, as well as Cusa, thought of his world not in anthropocentric terms, but as a place in which to discover the inherent presence of God. In this case, the idea was not to fool the eye and the mind, falling victim to Narcissus’s self-absorption. Indeed, this process of relating sense knowledge to intellectual or conjectural understanding of a deeper, non-empirical reality, I am suggesting, is finally also similar to the thought process encouraged by Alberti’s challenge to the reader/viewer: grapple with the opposites: on the one hand the sensual pleasure of self recognition (Narcissus), and on the other hand, the intellectual and spiritual beauty of transformation. Therein one discovers the power to generate and create, as suggested by the divinely infused transformative power of the flower.

The trick was to see the world in order to see God and one’s similarity to Him. Illusion becomes allusion, perspective serving as a metaphorical device to elevate sense experience to a higher perception.

Notes

1 A version of this chapter was originally presented under the title “Sight and Insight in Early Modern Image Interpretations: Tension and Resolution,” during the session “Perspectives on Nicholas of Cusa 11,” Renaissance Society of America Annual Conference, San Francisco, March 23, 2006.


9 Ibid., 65.

10 Ibid., 71–2. *Perspective*, he says, “seems to reduce the divine to a mere subject matter for human consciousness, but for that very reason, conversely it expands human consciousness into a vessel for the divine” (72).

11 Ibid.

12 In addition to Heninger, *The Subject of Form in the English Renaissance*, more recently see the important work of Nicholas Temple, *Disclosing Horizons: Architecture, Perspective and Redemptive Space* (London and New York: Routledge, [2006] 2007), as well as his Chapter 9 in this volume.

13 Edward Cranz, “1100 A.D.: A Crisis for Us,” *De Litteris: Occasional Papers in the Humanities* (1978), 84–108, offers a remarkable view of the importance of Cusanus’ epistemology of vision, which I believe is applicable as well to the implications of Alberti’s contemporary assertion of the importance of vision in bridging the gap between the limits of sense knowledge and the potential of intellectual knowledge as vision.


15 Ibid.


18 See, for example, Michael Kubovy, *The Psychology of Perspective and Renaissance Art* (Cambridge: Cambridge University Press, 1986), 1–16, 52–64; Ernst


21 Alberti, On Painting, 63; Alberti, Della Pittura, 76; I have used, however, the more correct transcription from Alberti, The New De Pictura of Leon Battista Alberti, 157–8.

22 Alberti, On Painting, 70; Alberti, Della Pittura, 85; Alberti, The New De Pictura of Leon Battista Alberti, 188.

23 Alberti, On Painting, 75; Alberti, Della Pittura, 91; Alberti, The New De Pictura of Leon Battista Alberti, 201–2.

24 For a recent volume discussing the pertinence of this religious dynamic for medieval art (though clearly not in paintings that contain single point constructions), see the essays in Jeffery F. Hamburger and Anne-Marie Bouché, eds., The Mind’s Eye: Art and Theological Argument in the Middle Ages (Princeton, NJ: Princeton University Press, 2006).

25 Both were carried out prior to Alberti’s text, and most likely under the influence of Brunelleschi’s famous panels depicting the sacred spaces central to Florentine identity, that between the Florence Cathedral and the Baptistery, as well as that of the piazza Signoria.


32 Indeed, an infinite pyramid wherein one would have to further “conjecture” that, like the center of Cusa’s infinite sphere, the apex at infinity is everywhere at once within its infinitely homologous measured form.


34 Miller, *Reading Cusanus*, 78–80, diagram 79.

35 Cusa possessed Alberti’s *Elementa picturae*, and as has been well documented, they traveled in some of the same circles and had common friends, such as Paolo Toscanelli. See, for example, Harries, *Infinity and Perspective*, 66–70, and Giovanni Santinello, *Leon Battista Alberti: Una Visione Estetica del Mondo e della Vita* (Florence: Sansoni, 1962), 265–9.
Criminal vision in early modern Florence: Fra Angelico’s altarpiece for “Il Tempio” and the Magdalenian gaze

Allie Terry

Fra Angelico’s *Lamentation Over the Dead Christ* offers a visual record of the criminal viewing experience during rituals of penal justice in fifteenth-century Florence (Figure 4). The *Lamentation* is the only extant altarpiece from the oratory of Santa Maria della Croce al Tempio, the final devotional space in which a condemned criminal was to spiritually repent for his or her sinful crime. Known as “il Tempio” in the fifteenth century, the small structure was maintained by laymen belonging to a confraternity whose mission was to prepare the condemned for the afterlife, to assist both the criminal and his or her family during the punishment process, and to serve as undertakers of the criminal body after execution.

As Samuel Edgerton first discussed, the confraternity also commissioned artworks to be used during the punishment process, including frescoes, hand-held painted panels (known as *tavolette*), and altarpieces, such as Fra Angelico’s *Lamentation*. Each of these works provided a visual model of Christian behavior at the hour of death. As “pictures of redemption,” the paintings facilitated the criminal’s reflection on his or her own impending death with the goal of inspiring confession and reconciliation in order for the salvation of the criminal soul.

Recently, scholars, including Nicholas Terpstra, Larry Feinberg, and others have brought attention to poignant intersections of the early modern criminal ritual process and the Passion narrative, and have argued for an identification between Christ and criminal as fostered by such ritualized acts as the criminal contemplation of paintings highlighting the body of Christ, to the procession of the criminal body just as Christ was processed to Calvary. Angelico’s painting also offers an image of Christ for contemplation by the criminal immediately before the execution process, and the bodily position of Christ within the painting echoed the future position of the criminal body after the punishment process. However, I argue here that the Christological framework applied to analyses of early modern punishment is actually
inconsistent with the visual cues embedded within the criminal’s experience in Florence from the moment of sentencing to the moment of execution. In the enacted spaces of the punishment process—from the Cappella della Maddalena inside the Bargello to the Oratory of the Tempio located near the gallows—Mary Magdalen provided a model for the criminal through painted frescoes, prayers, and Fra Angelico’s altarpiece. The confraternity members of the Tempio exploited these Magdalenian spaces in their mission to assist the salvation of the criminal soul.

By examining the type of beholding experience that was cultivated for the criminal in Florence, this chapter challenges previous readings of the criminal process within a strictly Christological framework and provides a new interpretation of Fra Angelico’s *Lamentation*. I argue that the gaze of the criminal before Fra Angelico’s altarpiece was rendered Magdalenian in nature, for the criminal was positioned as a sinner in a moment of conversion. The visual imagery that surrounded the criminal throughout the day of execution, as well as the somaesthetic stimulation of the penal rituals, prepared the criminal beholder for this transformative performance in front of Angelico’s altarpiece. Like Mary Magdalen, who prostrated herself before the body of Christ in repentance of her material indulgences, the criminal was faced with the incarnate vision of God and asked to make the cognitive shift from the material to the spiritual. Transcending issues of gender and class, the Magdalenian gaze was understood in fifteenth-century Florence as part of a larger repertoire of prayers and bodily gestures that communicated a specific request for forgiveness and the promised redemption through reformed behavior. The criminal adoption of a Magdalenian stance at the last hour thus precipitated the redemption that was necessary for the soul’s ascension after the expiration of the criminal body.

The layout of this chapter follows the spatial layout of the punishment process to highlight the overall transformative goal of the criminal experience, which may be distinguished in three primary stages. In the first stage, which immediately followed criminal sentencing inside the Palace of Justice, the criminal was introduced to the model of Mary Magdalen through frescoes and prayers and was situated within a synesthetic environment to enhance
the criminal body at work. In the second stage, during the public procession of the criminal body from the Palace of Justice to the oratory of the Tempio, the criminal body was emphasized as an object upon which communal judgment was enacted, and thus fostered a disengagement of the criminal with his or her own body. In the third stage, when the criminal was physically positioned in front of Fra Angelico’s altarpiece inside the oratory of the Tempio, the criminal was encouraged to align with the acts and deeds of Mary Magdalen and to transition from an embodied to disembodied state of being. While each stage of the punishment process was in itself liminal—that is, transitional and transformative—one can trace how the overall ritual of penal justice encouraged a model of behavior that heightened the criminal’s awareness of his or her own body and then encouraged the criminal to willingly discard this body in favor of spiritual reward.11

The criminal body at work

A criminal sentenced to death in Renaissance Florence was first tried, charged, and then held inside the Palace of Justice, now known as the Bargello, until his or her execution.12 Inside this palace, a chapel known as the Cappella della Maddalena served as the primary contemplative space for the condemned before the public procession to the gallows. Confraternity members joined the criminal within the chapel to assist the penitential process. Candles were lit, a mattress was laid on the floor, and prayers and chants by the confraternity filled the room with verbal encouragement to repent. As a result, the enclosed space of the chapel was transformed into an environment of synesthesis in which the criminal’s senses were simultaneously and consistently activated.13 In addition to the aural activation provided by the confraternity chants and prayers, the criminal’s other senses were engaged with the penitential process through looking, touching, and tasting.14 The criminal’s eyes were guided toward tavollette, altarpieces and the frescoes adorning the chapel walls; the criminal’s body bore the memory of the touch of instruments of torture before this contemplative moment, and continued to feel the constraining touch of the ropes or chains that bound his or her hands together; the criminal’s lips touched the painted panels held by the confraternity members during repeated kisses; lit candles and the criminal’s own sweat were among the smells picked out by the criminal’s olfactory senses, and ultimately, the criminal’s tongue would taste the Eucharistic bread and wine offered to him or her at the last communion. This complete activation of the criminal body during the penitential process heightened the criminal’s aesthetic appreciation of the visual cues around him in what may be called the criminal’s somaesthetic stance.

Somaesthetics is the philosophical branch of pragmatist aesthetics, first developed by Richard Shusterman, that advocates for a renewed interest in the living sentient body as a locus of the mindful appreciation of art and life.15 While the body at work as an ameliorative aspect of religious and other ritual
practices has been widely discussed, somaesthetics re-centers the body from its displaced position within aesthetics and connects the active body, and the conscious awareness of the body, to an individual’s experience of visual and other sensory encounters.\textsuperscript{16} Shusterman connects this self-conscious attention on the “soma” to the enhancement of one’s affective perception. He claims:

> By being more mindful of our experience, we can—as Montaigne argued—augment our enjoyment of it. And the cultivation of the beauty and art of appreciating, mindfully inhabiting, and shaping our affective lives should not be seen as selfish retreat to the private sphere. By sharpening the acuity of one’s affective perception, one learns how to be more sensitive to others and to the environment that shapes one’s feelings, which are not simply the product of private ideas in one’s head but rather of a network of interrelations with one’s environing others, both animate and inanimate.\textsuperscript{17}

While Shusterman has largely used somaesthetics to refer to contemporary practices and experiences, I use it here to discuss the self-conscious cultivation of the body in early modern Italy as an effort to enhance the visual encounter between the viewer and object. As discussed below, the benefits of closely conditioning the criminal body in conjunction with select artworks during the penal process in early modern Florence included the salvation of the criminal soul, which was the mission of the comfort confraternity.

The visual cues of the chapel’s decoration clearly delineated a path of repentance for the criminal. While the image of Paradiso loomed above the altar, the image of Inferno confronted the criminal every time his or her eyes turned toward the exit of the room.\textsuperscript{18} To achieve a place among the blessed in heaven from the criminal’s current station among the sinful destined for hell, the criminal had to actively participate in his or her own repentance. Mary Magdalen, the blessed sinner, provided the framework for this repentance through her life narrative frescoed on the southern wall of the chapel. Seven scenes of the Magdalen visualize the grace that was bestowed upon the saint, from her conversion in the House of the Pharisee to her spiritual communication with angels, her ingestion of the Eucharist, and her blessing by Bishop Maximinus.\textsuperscript{19} The frescoes visually connect the opposing scenes of heaven and hell on the east and west walls, and thus visually outlined a spiritual path for the criminal in the chapel.\textsuperscript{20}

The Magdalen also provided a mirror for the necessary psychological and bodily comportment of the criminal during the punishment process. Medieval conversion narratives of the Magdalen, promoted through Italian sermons of the fourteenth and fifteenth centuries, emphasized the saint’s active internalization and externalization of penitence.\textsuperscript{21} Preachers encouraged their congregants to emulate the Magdalen’s inward shame and outward acceptance of bodily pain, attributes that facilitated the steps of the penitence process.\textsuperscript{22} Appropriate bodily gestures, such as lowered eyes, kneeling to the side of a confessor, and tears, were signals of a penitent’s shame and humility. For example, the Dominican prior of Santa Maria Novella, Fra Jacopo Passavanti, preached:
To be the person who wants to confess well, one has to go to the feet of the priest sorrowfully and repentant of every sin. What the malefactor must do before the judge who has to judge him, is to throw himself humbly at his feet, either sitting or kneeling, in such a manner that he is at his side rather than before him.\textsuperscript{23}

Modeled on the Magdalen’s behavior in the House of the Pharisee, in which she kneeled to the side of Christ’s feet and washed him with her tears, the criminal performed these gestures within the chapel of the Magdalen as a sign of shame felt at the sin.\textsuperscript{24} Nicholas Terpstra has demonstrated that even in cases when the accused was, indeed, innocent of the crime charged, the comforters assigned to assist in the penitential process encouraged the criminal to think of other sins that he or she had committed for which prayers of forgiveness must be said.\textsuperscript{25} The criminal was then encouraged to accept the charge and to consider the benefits of gaining access to heaven by leaving the material world now, as opposed to some unidentified moment in the future.

Likewise, the Magdalen offered a model for the criminal’s acceptance of bodily pain as a means to expunge this sin. Domenico Cavalca’s fourteenth-century narrative of the Magdalen reminds us that bodily pain was indeed a prerequisite for God’s mercy:

She scratched her face until blood came … she struck her eyes and her face with her fists; and taking a stone she struck herself, on her breast … and she struck her feet, her legs, and her arms … and she cried, “Take the reward, O my body, of the vain pleasures thou has frequented.”\textsuperscript{26}

The Magdalen’s willingness to inflict pain upon her body signaled her transition from the realm of the material to the realm of the spiritual; no longer a woman who resided and took pleasure in the body, the Magdalen moved beyond her body to connect with God in the celestial sphere. Similarly, the criminal praying within the Cappella della Maddalena understood that the judicial system did not allow for a bodily redemption; rather, the criminal body must be eliminated as the necessary indicator of effective justice.\textsuperscript{27} As such, the criminal was encouraged to follow the path of the Magdalen and ultimately reject the body in favor of spiritual reward. The intense sensory environment cultivated by the confraternity brothers in the chapel, and the somaesthetic positioning of the criminal within it, intensified the criminal’s decision to move beyond his body in the Magdalen’s footsteps.

The objectification of the criminal body

When the moment for the punishment ritual arrived, signaled by the ringing of the montanina (funerary bell), the criminal moved from the sacred space of the chapel, through the corridors of the Palace of Justice, and out into the open air of the loggia. Moving toward the staircase that leads down to the courtyard of the building, the criminal’s sentence was publicly announced,
trumpets sounded, and the processional cart was prepared. This cart, raised on wheels and large enough to hold both prisoner and confraternity members, then traveled a prescribed route from the site of justice inside the city to the site of punishment outside the walls.

The penitential focus on shame and humility in the Cappella della Maddalena prepared the criminal for the rituals of humiliation that were integral to the punishment procession. Through the coordinated gaze of the crowd that filled the courtyard and lined the streets of Florence, shame was publicly inflicted upon the elevated criminal body in the cart. As Jean-Paul Sartre aptly described in his examination of the gaze: “to be looked at is to apprehend oneself as the unknown object of unknowable appraisals—in particular, value judgments.” The objectification of the criminal through the collective gaze of the crowd was a means by which the community of Florentines imposed their moral and civic judgment upon the criminal.

The active gaze of the crowd should be seen in contrast to the tightly controlled gaze of the criminal during the procession from the Bargello to the execution site. The confraternity members, accompanying the criminal in the cart, channeled the criminal's vision to hand-held painted tavolette held just inches from the criminal's eyes. The panels were roughly one foot in height and eight to ten inches wide, although even larger with their wooden frames, and were intended as a means of offering an image of Christian redemption through their represented subjects of martyrdoms. Edgerton argued that these panels may be considered as “antidote[s] to the physical and psychological punishment” suffered by the criminal since they “taught that if the victim accepted physical torture and penance here on earth, he might then win eternal redemption for his soul in heaven.” However, the panels served an equally potent function to create further imbalance in the power relations between the crowd and the criminal during the procession. Through the positioning of the criminal in the elevated cart, but without visual control of his or her own gaze, the criminal was unable to reclaim his or her agency by disrupting the collective gaze of the crowd through the act of looking back.

The differing levels of control over the visual gaze during the punishment process is analogous to the relation of the viewer to fifteenth-century female portrait paintings poignantly discussed by Patricia Simons. Just as the profile portraits of Florentine women assumed the function of honoring and extending the legitimizing performance of marriage rituals, in which the visual display of the bride was key, the unimpeded access to the criminal by the crowd was a means to legitimate the judicial act by providing a material object toward which the witnesses could direct their judgment. The female bride, both in life and in her painted representation, was expected to divert her gaze and act as “an object of public display” to allow the crowd to witness the material transfer of property—her body—from the father's to the groom's household. Her performance was controlled, as was her painted representation, to project favorably on her husband, as opposed to revealing information about herself. Likewise, the criminal was expected to behave according to the controlled
choreography of the punishment ritual as an object of public display to allow
the crowd to witness the effective performance of justice, not information
about his or her own subjective position.36

After the initial procession moved from the Bargello down the Via del
Proconsolo to the Via dei Neri to Borgo Santa Croce, it traversed the Piazza
Santa Croce, where the criminal, still elevated and objectified in the cart, stood
in shameful contrast to the pantheon of Florentine notables buried beyond
the façade of the church. The criminal then processed to the appropriately
named Via dei Malcontenti, which led directly to the gates of the gallows.37
Passage over the threshold of the gates marked the final exit of the criminal
from the city, since both the criminal’s death and burial were to be executed
outside the walls.38 The physical removal of the criminal body from the sacred
space of the city and into the profane space of the gallows literally ejected the
criminal object—both the crime and the performer of the crime—from the
civic sphere.

The disengagement of the criminal and the body

Although the scaffolds would be ready on the pratello della giustizia, the
criminal was first escorted to the frescoed building to its right, the oratory
of the Tempio.39 Another liminal passage into the oratory marked another
“last,” the final prayers of the criminal before his life was extinguished
at the gallows just beyond the door. Inside the oratory, the criminal was
processed to a position confronting the altarpiece of the Lamentation and was
tied to a stake fixed in the ground before it.40 From the criminal’s position
on his or her knees before Fra Angelico’s painting, the Lamentation visually
continued the penitential program that was initiated inside the Cappella
della Maddelena.

The Lamentation scene is situated in a field outside the walls of a city,
much like the gallows in Florence where the criminal was to go after mass.
Arguably, the painting references both the represented body of Christ within
the image and the real body of the criminal standing before it as criminal
bodies, removed from the sanctity of the inner city and placed in the profane
space of the gallows. Commanding the entire foreground, Christ’s deceased
body is intimately tended to and revered by a crowd of his followers. The
viewer has nearly unimpeded access to Christ’s face and body, for his corpse
is represented lifted from the ground on the knees of the Virgin Mary and
a Dominican nun and tilted slightly toward the surface plane. This visual
connection between the criminal viewer and the painted body of the Dead
Christ offered a distinct reference to the future somatic position of the criminal
beholder once brought down from the scaffolds of justice. In addition to the
assistance that the confraternity members of the Tempio offered to the criminal
during the punishment process, the brothers were also charged with the care
of the criminal’s body at the conclusion of the judicial rite. The confraternity
was responsible for the covering of the body immediately after execution, the recitation of prayers, and the burial of the cadaver in the cemetery designated for criminals, which was also located outside the walls between the Tempio and the Arno. In this way, Angelico’s painting not only fostered a bodily connection between the future position of the criminal and the executed figure of Christ; it also fostered a functional association between Christ’s followers and the confraternity brothers, and thus may be considered as a comforting strategy offered to the criminal viewer.41

Contrasting with the crowded foreground, it is the emptiness of the cross that commands the attention of the upper half of the Lamentation panel. The articulation of the nails protruding from the outer edges of the horizontal beam of the cross, and the shadows cast by them, enhance the effect that the nails are coming out into the space of the viewer. The illusionism of the beam and nails ruptures the narration by bringing the empty cross into the psychological space of the criminal viewer. The punishment enacted on the incarnate body of Christ is thus personalized in the criminal’s own ritual process of punishment. The composition, with its bifurcate emphasis on the empty cross and the crowded gathering, demonstrates the narrative and temporal structure of the painting from top to bottom, from the apparatus of execution to the aftermath, in the same sequence that the criminal was to undergo.

Samuel Edgerton has argued that Fra Angelico employed the same visual strategy in the Lamentation that he used in the San Marco cell frescoes that he painted in roughly the same period: that is, to foster personal, private devotion, presumably between the beholder and the figure of Christ.42 Yet this analysis does not account for the disjunction in identification between the criminal and Christ in relation to the nature of sins committed. While Christ was indeed accused, tried, and executed as a criminal heretic, Christ’s soul was unblemished by sin.43 The criminal, on the other hand, was placed in the position before the altarpiece precisely due to the blemishes of his or her soul.44 By the time the criminal crossed the threshold of the oratory and knelt before Angelico’s painting, the criminal had already accepted the responsibility for his or her sins and was conditioned to look forward to the moment of execution and after. The critical differentiation between unjustified and justified punishments was cause for criminal self-reflection and, I argue, did not necessarily facilitate identification with Christ, but rather reiterated the criminal’s sinful position in the face of Christ’s sacrifice. This positioning placed the criminal in alignment with the Magdalen and her followers—that is, sinners who convert.45

As the criminal kneeled before the image, the confraternity members of the Tempio continued to encourage the criminal to focus on repentance through their chants and prayers. The criminal already had many moments to reflect on repentance while waiting inside the Cappella della Maddelena for this moment to arrive. But the Magdalen as a model for criminal reflection and redemption is further highlighted in Fra Angelico’s
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*Lamentation* by the placement of the Magdalen in the right foreground of the painting and the inclusion of the figure of the Beata Villana, shown in the black garments of a Dominican tertiary just behind the prostrate figure of the Magdalen. Beata Villana was a local Florentine religious figure, who was notably described as a “second Magdalen” by Fra Girolamo di Giovanni for her pre-conversion propensity for the material splendors of marital life.\(^4\)

The Beata Villana enacted her role *qua* pre-conversion Magdalen until one day, according to certain narratives, she saw her demonic reflection in a mirror three times and converted in order to live out her life devoted to Christ.\(^4\) In Angelico’s painting, words issue forth from the Beata’s lips that proclaim, “Christ Jesus my Crucified Love,” a declaration associated with the Beata after her conversion away from the material entrapments of married life. Her great-niece and nephew collaborated to realize her representation in her final role as a beatified saint aligned with the Magdalen at the feet of Christ.

The rendering of the Beata in slightly smaller scale than the figures surrounding Christ’s body and her positioning behind the prostrate figure of the Magdalen aligns the beatified figure with Fra Angelico’s representations of Saints Dominic, Thomas Aquinas, and Peter Martyr in the frescoes found in the dormitories of the Observant Dominican convent of San Marco. In the dormitory frescoes, Dominican figures act as beholders of Biblical events, from Christ’s Nativity through his Crucifixion, thus fostering an interplay between the participatory witnesses painted within the scenes and the self-conscious viewers standing before them. The inclusion of a painted Dominican saint in nearly every fresco in the friar’s cells—despite the historical and narrative disjunctions in doing so—reveals that the extraneous Dominican figures were intended to act as means of entry into the represented scene and to encourage their Observant Dominican viewers to identify with the saint represented in the act of witnessing.\(^4\)

In the *Dead Christ in front of the sepulcher (Lamentation)* located in Cell 2 of San Marco, John and the three Maries tend to the body of Christ as St. Dominic looks on from the viewer’s left (Figure 5). The holy figures gathered on the ground direct their gazes to the physical traces of Christ’s execution; they hold his pierced hands and feet in their own hands, and the Virgin rests Christ’s bloodied head on her lap. They pay no attention to St. Dominic, who stands outside of their circle and hovers above them. He raises his right hand in benediction and holds a lily, the symbol of his own martyrdom, in his left. He, too, stares at the corporeal remains of Christ, though he is bodily distanced from it and thus is psychologically removed from the historical moment, though not the conceptual conjuring of the scene. Dominic’s inclusion in the image is as an imagined witness to the distant past, and the Observant Dominican friar resident in the cell, wearing the same clothing as his spiritual predecessor, was most likely to associate himself with him as he too looked on the sacred scene and witnessed Christ’s wounded flesh.
This notion of self-imaging via a Dominican witness is even more apparent in the fresco of the *Annunciation* in the adjacent cell (Figure 6). In a loggia not unlike the architectural space of the cloister of San Marco, Gabriel announces to the Virgin her future role as the mother of the Christ Child. The Virgin has her arms crossed over her chest in a gesture of acceptance, and two fingers of her right hand lay propped within a prayer book resting in the crook of her left arm. She leans forward toward Gabriel, with her eyes and face impassively turned upward toward the angel, who reflects the Virgin’s gestures by crossing his own arms. The shadow cast upon the wall behind the Virgin reaffirms her human form and distinguishes her from the angel before her. However, the two protagonists of the fresco share the same spatial frame, the loggia, and their reciprocated gaze locks them into a psychological bond.
Outside of the physical setting of the loggia and the psychological space of the scene stands St. Peter Martyr on the far left edge of the painting, with his hands pressed together in prayer. In his white tunic and black robe, the saint is unmistakably Dominican. Though he appears to fix his gaze steadfastly on the figures before him, his position within the scene is illogical; if the scene were mapped out in plan, Peter Martyr would be staring at the back of Gabriel. However, compositionally, his position serves to place him at the beginning of a chain of actions within the frame. His fixed gaze leads one horizontally to Gabriel, whose gaze leads diagonally to the lower right to the Virgin. The Virgin's reciprocated gaze then reverses this diagonal thrust to Gabriel, and finally to Peter Martyr once again. He becomes the locus for the real viewer to enter the scene and to witness the events before him in a bodily way, just as the Dominican meditational exercises encouraged the friars to do.
In both examples discussed here, the witness provides an earthly avenue by which the viewer identifies with the central scene and enters into understanding of it. Just as Peter Martyr and Dominic stand and kneel outside the represented scene and look in, so does the spectator stand outside of the image and look in. At the same time, this literal representation of a witness creates a disjunction in the psychological involvement of the real viewer. This viewer is twice-removed—that is, the viewer identifies with a viewer—and therefore draws attention to the act of viewing itself. The viewer moves from identification and participation within the central image to an awareness of the artificiality of the viewing construction.

Fra Angelico’s *Lamentation* in the oratory of the Tempio similarly functions for the criminal viewer kneeling before it. Positioned as a sinner in contemplation of the Dead Christ, the viewer accesses the scene *vis-à-vis* the sinner-turned-saint. From the Beata to the Magdalen, the criminal accessed the sacred body of Christ through his or her eyes, hands, and lips. Katherine Ludwig Jansen has recently drawn attention to late medieval devotional literature that developed around the cult of the Magdalen, and in particular certain prayers that devotees recited to entreat the Magdalen to aide them. Of particular significance here are the historical instances of prisoners using these prayers during the punishment process to ask for intercession and forgiveness. One prayer, found in the early fifteenth-century manual known as “Instructions for a Devout and Literate Layman,” guides men to act as Magdalen acted during her conversion and to throw themselves at the feet of Christ:

> With Mary Magdalen throw yourself at the feet of the most sweet Jesus, and wash them with your tears and anoint them and kiss them; and if not with your eyes and your mouth, at least do this in your heart. Do not climb up to the cross, but in your heart say with the publican: “Lord be merciful to me a sinner.”

The criminal, prostrate in his or her fixed position before Angelico’s altarpiece, was already conditioned to follow the behavior of the Magdalen during the penitential process, from the demonstration of shame through tears and bodily gestures and the enactment of contrition through the acceptance of physical pain. Placed before the image of the prostrate Magdalen and her mirror image in the figure of the Beata Villana, the criminal also prostrated him or herself at the feet of Christ and requested forgiveness. The painting thus assumes the role of the mirror of conversion. Just as Magdalen acquits herself of the material world to embrace the spiritual, so too was the criminal beholder positioned to transition from the material to the spiritual. The model of conversion offered by the Magdalen—of the body to beyond the body—was necessary for the criminal in his or her imminent future.
Notes

1 This chapter was first presented at the Renaissance Society of America conference in Chicago, 2008. I have also had the opportunity to present portions of this contribution to scholars as works-in-progress, and would like to thank these individuals for their helpful critiques, especially my colleagues in the Writing Visual Culture group at the Institute for the Study of Culture and Society and my colleagues in the faculty Publication group at the Center for Teaching and Learning at Bowling Green State University.


3 On September 30, 1361, the Florentine Republic set aside land for the confraternity to construct a chapel for condemned criminals to pray before execution and to create a cemetery for criminal bodies: “braccia trenta di terreno fuori della porta di San Francesco, vicino al luogo della Giustizia, affinche’ ivi fosse fabbraicat una Cappella dove, nel passare, i condannati a morte potessero sentir messa ed i loro corpi vi si potessero seppellire”; cited in Eugenio Capelli, La Compagnia dei Neri: L’Arciconfraternita dei Battuti di Santa Maria della Croce al Tempio (Florence: Le Monnier, 1927), 30.

4 The confraternal mission is found in BNF, II, I, 138.


Somaesthetics can serve as a framework for many already existing categories of philosophical inquiry—from the body at work in the style of visual studies (optics, phenomenology, and so on) to Foucaultian analyses of various constraints placed upon the social or cultural body to the cultivation of the physical body in such places as gyms, yoga centers, or fitness camps. I will discuss my use of somaesthetics in the investigation of early modern punishment rituals below.


The type of beholding fostered by Fra Angelico’s altarpiece must be understood as part of a larger choreography of directed gazes for criminal and crowd that the administers of the punishment process coordinated throughout the city on the day of execution. See Allie Terry, “The Craft of Torture: Bronze Sculpture and the Punishment of Sexual Offence,” in Allison Levy, ed., *Sex Acts in Early Modern Italy* (Farnham: Ashgate, 2010), 272–96.


The term “Bargello” derives from the Latin barigildus, to indicate the fortified tower of its architecture, but it was used to describe the site after the mid-sixteenth century, when the palace was transformed into the prison house under the direction of the Medici grand-dukes; Beatrice Paolozzi Strozzi, “La Storia del Bargello,” in B. P. Strozzi, *La Storia del Bargello* (Milan: Silvana, 2004), 74, fn. 77.

I use the term “synesthesis” in its Greek etymological sense to refer to the full activation of the senses. For a Byzantine example of synesthesis and religious experience, see Bissera Pentcheva, “The Performative Icon,” *Art Bulletin* 88:4 (2006), 631–55.

The bodily comportment of the criminal is described in the *Libro dei Giustiziati*, 167 recto ff. For aspects of criminal kissing of the tavolette, see Feinberg, “Imagination all compact.”


The scenes are arranged in two registers and read from left to right: the Feast in the House of the Pharisee, Resurrection of Lazarus, Mary at the Tomb, Noli me tangere, the Magdalen’s communication with angels, the Communion of the Magdalen, and the blessing of the Magdalen by Bishop Maximinus. A further scene is found on the north wall, the Miracle of the Prince of Marseilles.

For an exploration of the Magdalen as a visual source for conversion in the Baroque period, see Franco Mormando, “Teaching the Faithful to Fly: Mary Magdalene and Peter in Baroque Italy,” in F. Mormando, ed., Saints and Sinners: Caravaggio and the Baroque Image (Chicago, IL: University of Chicago Press, 1999).

Jansen, The Making of the Magdalen, esp. 212–44.

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Ibid., 207.

Ibid., 213.

When Luca Della Robbia acted as a comforter to the criminal Pietro Pagolo Boscoli inside the Bargello in 1513, he advised: “You want to have a sweet affection for God with tears and sighs, and you want your intellect to spontaneously consent to the faith”; Luca Della Robbia, La Morte di Pietro Paolo Boscoli, ed. R. Bacchelli (Florence, 1943), 82, cited in Richard Trexler, Public Life in Renaissance Florence (Ithaca, NY: Cornell University Press, 1980), 200.

Terpstra, “Piety and Punishment,” 683.

See, for example, the visualization of this judicial attitude in the frescoes of the Sala della Pace in the Palazzo Pubblico of Siena.

Sometimes the cart also included a brazier filled with hot coals for the heating of iron torture instruments to be used on criminals designated as attanagliato; Edgerton, *Pictures and Punishment*, 141.


Certain condemned criminals were placed on an ass in lieu of the processional cart, presumably for the enhancement of shame that was central to this part of the ritual process. See Terry, “The Craft of Torture.”


Ibid.

Even the confraternity members, in such close proximity to the criminal, did not offer a means of disrupting the criminal’s apprehension of self as “a spatializing-spatialized,” since they purposefully masked their individualized gazes with black hooded robes; Sartre, *Being and Nothingness*, 266.


For examples of criminals who did not conform to the expected criminal comportment in Florentine punishment rituals, see Trexler, *Public Life in Renaissance Florence*.

The monumental Porta della Giustizia was opened, a clear indication of an impending execution since it was only opened on such an occasion; Edgerton, *Pictures and Punishment*, 141.

While certain criminal executions did, in fact, occur inside the walls, those individuals in the care of the confraternity of the Tempio were generally escort outside the walls of the city and buried in the extramural cemetery. The liminal passage from city to gallows must be understood in terms of Van Gennep’s rites of passages.

The exterior of the oratory was painted with frescoes by Spinello Aretino of the Passion of Christ, datable to 1390; Edgerton, *Pictures and Punishment*, 194.

Ibid.

Yet, I have argued thus far, the gaze of the criminal was rendered Magdalenian in nature, for the criminal was positioned as a sinner in a moment of conversion. That the Magdalen was of particular significance to the criminal viewing experience is attested by her prominence in the Bargello chapel, as well as by the virtual absence of visual references to Dismas, the criminal who was forgiven in the last minutes before his execution at Christ’s side. Although Dismas was, in fact, a patron saint of condemned criminals and his beneficence was often highlighted in representations of the Crucifixion, in Florence the Magdalen provided the conversion model for the criminal. In the *Golden Legend*, Jacobus of Voragine drew attention to the etymological connection of the Magdalen with guilt and conversion; Ryan Granger and Helmut Ripperger, ed. and trans., *The Golden Legend* (New York: Arno Press, 1969), 355.

43 As acknowledged by the Centurion upon Christ’s death: “Surely this was a righteous man”; Luke 23:44–7.

44 For an extensive discussion on the relation of sin and pain, see Cohen, “The Animated Pain of the Body,” esp. 44ff.


46 “Having celebrated her marriage according to the customs of the times, by divine permission Villana’s mind began to indulge in the marital embrace such that almost all the fervor she had in her former life grew lukewarm, and she was more concerned with pleasing the world than pleasing the Lord. Just as a second Magdalen aspiring to greater magnitude of life, she strove to pamper her body (once content in ashes and hair cloth) in soft cloth, jewels and gold;” quoted in Jansen, *The Making of the Magdalen*, 251.

47 Beata Villana’s relationship with Christ was enhanced by visions in which Christ presented himself as beaten and crucified; see Pope-Hennessy, *Fra Angelico*, 17.

48 The only exceptions to this claim are the frescoes of *Noli me tangere* in Cell 1 and the *Crucifixion with the Virgin Mary* in Cell 22, which do not include a painted Dominican saint.

49 See, for example, the case of a thief named Jacobus, who prayed to the Magdalen for help while in jail; Jansen, *The Making of the Magdalen*, 247–8.


51 The phrase “mirror of conversion” was a common trope in popular sermons on the Magdalen.
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Donatello's *Chellini Madonna*, light, and vision

*Amy R. Bloch*

On August 27, 1456, the Florentine physician Giovanni Chellini noted in his ricordanze the receipt of a bronze roundel from Donatello in exchange for medical treatment he had given the 70-year-old sculptor (Figure 7).\(^1\) Chellini described the work succinctly in the relevant entry: “Donatello ... gave me a tondo as large as a serving tray, on which is sculpted the Virgin Mary with the [Christ] Child at her neck and two angels at each side, all in bronze.”\(^2\) The relief (28 cm in diameter), now in the Victoria and Albert Museum in London, depicts a crowned and nimbed Virgin Mary, holding the Christ child against her chest, along with the four angels—two to either side of the central group—behind a low barrier fence and within a round frame decorated on its front surface with imitation Kufic script. Originally, passages of the roundel’s obverse were highlighted with gilding, although much of it has been lost. The sensitively sculpted tondo reveals Donatello’s skill in manipulating wax to produce delicate details in cast bronze. Pencil-thin fabric folds of the Virgin’s headdress and cloak vibrate and ripple as they streak across her body and contrast with the smooth yet subtly modeled surfaces of her hand, neck, and face.

After describing the size and subject of the relief, Chellini added a sentence about the roundel’s function, which was most unusual for sculptures of its type. Donatello included on the reverse of the *Chellini Madonna* a hollowed-out depression (Figure 8) that is an exact negative image of the design found on the work’s front, so that, Chellini says, “melted glass can be cast on [the back] and would make those same figures from the other [that is, obverse] side.”\(^3\) While there survive today two stucco copies of the *Chellini Madonna* that were probably produced in the late fifteenth century, there is no extant evidence—visual or documentary—that glass casts of it were ever made in the years immediately before or after 1456. The feasibility of doing so, however, was confirmed in the 1970s, when glass replicas were successfully made from two bronze copies of the tondo’s reverse (Figure 9).\(^4\) The presence of the finely cleaned and chased depression on the tondo’s back supports the likelihood that Donatello meant it to be replicated in the process Chellini describes,
as does the fact that the edges of the relief’s reverse were not left rough or hollow, which one would expect had the relief been meant only for display, but are fully finished, thus permitting the production of a glass copy with an identical decorative edge.5

To produce the final bronze roundel, Donatello devised a complex and unusual procedure. The flawless flat surface of the background and the work’s perfectly circular shape seem to be the results of the employment of a turned wooden plate in the completion of the initial model; and to produce an exact negative impression of the obverse on the sculpture’s reverse, Donatello made a paired, double plaster or clay mold that turned out a wax model ready to be invested and cast in bronze.6 During its production, versions of the Chellini Madonna thus existed in wood and wax, plaster or clay, wax within investment material (of plaster, terracotta, clay, or some combination of the three), then bronze, and, possibly, glass. The creation of the roundel was accomplished through the use of a dazzling array of media; Donatello’s material creativity is breathtaking.

But what might the various media employed in the production process have signified to the roundel’s viewers, and in particular to Chellini? Part of my purpose in this chapter is to examine the meaning of the substances employed in the roundel’s production, as well as the significance of the main material transformations involved, or potentially involved, in its
creation: the replacement of the invested wax model with molten bronze, for example, or the creation of the glass roundel from the metal mold. Had the work been carried out in glass, another substance—one rarely employed in the facture of sculpture before 1450—would have played a key role in stimulating viewers’ interpretations of the *Chellini Madonna*: light. When emanating from the glass roundel, this light, perhaps tinged by the glass (if colored glass was used), would have inevitably recalled a common theological simile in which Christ was likened to a beam of light and the Virgin to a piece of glass through which the beam had passed. As we shall see, optical theories dictated that seeing this light meant absorbing and internalizing it, a process akin to the ingestion of the host. The *Chellini Madonna* offered the potential for salvation through sight. Light, however, not only carried salvific power, but also, as it emerged from the glass form, evoked through its materiality the earlier physical transformations that led to the production of the work—from wax to bronze, and bronze to glass—and perhaps encouraged viewers to ponder the meaning of the materials used to produce the object. When considered sequentially and symbolically, these material transformations produced a rich chain of associations tied to, and possibly meant to reinforce, the function and theological significance of devotional imagery.
Giovanni Chellini and Donatello: Physician and sculptor

The relief is one of several artworks Giovanni Chellini either received in exchange for his services or commissioned during his lifetime. In 1456 Antonio Rossellino sculpted for him his portrait bust, a highly realistic image carved after a life cast of Chellini’s head. Before he died in 1462, Chellini provided funds for the endowment and construction of a chapel in the church now called San Domenico in San Miniato al Tedesco, which eventually held his tomb, a work most often attributed to Bernardo Rossellino or members of his workshop. In addition to his activities as a patron of art and architecture, Chellini actively collected books and built up a small yet diverse library from which, his diary indicates, he frequently loaned items to his friends and colleagues, as was often done by doctors in an
age when the cost of books was high. His collection included several medical
treatises, as well as ancient literary, philosophical, and historical works. His
diary and tax (catasto) declarations indicate that he owned copies of the
following books: Aristotle’s Nicomachean Ethics (in Leonardo Bruni’s Latin
translation), Logical Treatises (presumably the texts of the Organon), and
Physics; the Canon of Medicine by the eleventh-century physician-philosopher
Ibn Sinâ, known as Avicenna; the Practica of the second-century (BCE)
Greek doctor Serapion; one or more treatises by the eighth- to ninth-century
Assyrian doctor Ibn Mâsawaîh, known as Mesue; the Liber ad Almansorem (the
Book of Medicine, translated into Latin from Arabic in the twelfth century) by
the ninth- to tenth-century Persian physician and intellectual Ibn Zakariyâ al
Râzi, called Rhazes; the Sermones medicinales (Medical Sermons) of the Florentine
doctor Niccolô Falcucci (d. 1412); the Traité de la Sphère (in the French original
and in Italian), a treatise on physics by the fourteenth-century theologian and
scientist Nicolas Oresme; an unidentified text by the Roman grammarian
Pompeius Festus (Katharine Park suggests it was On the Signification of Words),
who wrote in the second century CE; a Latin translation of Diogenes Laertius’
On the Lives of Philosophers; and, for short periods when they were left as
security for loans, plays by the Roman author Terence and certain works of
Cicero. He owned also a copy of the Articella, a late medieval compilation of
several medical treatises by various authors, including Galen and the ninth-
century Arab writer Ibn Ishâq, known in the West as Joannitus.

While a number of books in Chellini’s library reveal his awareness of
intellectual developments in fifteenth-century Florence, and in particular the
contemporary interest in the recovery and study of ancient Greek and Roman
texts, his artistic patronage and collecting habits speak to his engagement with
technical and stylistic innovations in art and his proclivity for acquiring types
of images rarely produced before the middle of the fifteenth century—what
might be described today as experimental artworks. The bust by Rossellino,
for example, represents the first portrait carved after a life cast. Cennino
Cennini outlines the process of making a cast of a subject’s head in his Libro
dell’arte (written c. 1390), but it was not employed often in the production of
portrait busts until the middle of the fifteenth century.

The Chellini Madonna, while representative of a general class of images—
the small-scale, domestic, devotional relief of the Virgin and Child—that were
wildly popular in fifteenth-century Florence, was unusual in both medium
and function. Most often, devotional images meant for domestic contexts
were sculpted or molded in terracotta or gesso and painted and placed in
frames decorated with the coat of arms of the commissioning or purchasing
family. The first examples of this type likely came out of Ghiberti’s workshop,
in which Donatello worked as an assistant between 1404 and about 1407,
where the existence of ample amounts of clay used for model-making and
bronze investment, the presence of numerous assistants, and Ghiberti’s
desire to profit financially from his activities, made the production of such
works both possible and logical. Images of the Virgin and Child were not
frequently made in bronze in the fifteenth century, perhaps owing to the cost of the material and the difficulty involved in casting it.\textsuperscript{15} John Paoletti has also connected the scarcity of bronze devotional works—large or small, private or public—to limitations associated with the visual properties of the medium itself.\textsuperscript{16} Works cast in bronze, with their patinated surfaces defined by a uniform, brown-green cast and without the painted features that were often added to the gesso or terracotta examples, “lacked that verisimilitude which could transport the viewer into sacral time.”\textsuperscript{17} Well-known exceptions to this general pattern include Donatello’s \textit{Chellini Madonna} and the Crucifix and altar sculptures he made for the Santo in Padua between 1444 and 1450.

While the medium of the \textit{Chellini Madonna} sets it apart from most other extant depictions of the Virgin and Christ, its function as a mold makes it unique among all known sculptures produced before the fifteenth century in Italy. To limit the amount of expensive and heavy bronze used in their production, bronze reliefs were typically comprised of only a thin shell of metal, sometimes with additional, solid pieces attached.\textsuperscript{18} Perhaps this practice, which produces a hollowed-out form on the relief’s back that corresponds roughly to the shape and appearance of the image on the work’s obverse, gave Donatello the idea to finish, chase, and clean the hollow on the reverse of the \textit{Chellini Madonna} and employ it as a mold in the glass-casting process.

Donatello had considered the visual effects of glass as early as the mid-1430s, when the operai of Florence Cathedral paid him to design a stained-glass window depicting the Coronation of the Virgin for an oculus located on the eastern side of the church’s drum.\textsuperscript{19} Its design differs fundamentally from most other stained-glass windows at Florence and elsewhere, which typically contain many small patches of juxtaposed color, and thus numerous small pieces of colored glass placed in close proximity. Donatello’s window contains a few broad, uniform swaths of colors like red, teal, and blue, each comprised of many variably shaped pieces of glass. The use of a few zones of color gives the window’s forms a sense of physical monumentality, renders them especially visible in the dark church, and introduces into the church, when the sun’s rays penetrate the window, large pools of shifting colored light.\textsuperscript{20} As Charles Avery and Anthony Radcliffe point out, citing John Shearman, the pieces of glass used in Donatello’s design are cut specifically to give certain parts of the window a sculptural effect, an indication that he not only designed the window, but also played some part in fashioning the pieces of glass used to produce it.\textsuperscript{21}

Donatello’s understanding of the symbolic and expressive potential of glass only increased during and after his extended stay in Padua between 1443 and 1453. The \textit{Chellini Madonna} demonstrates this interest, as does at least one other tondo often attributed to him and dated to the period just after his Paduan years, the so-called \textit{Piot Madonna}, which was carried out in terracotta and decorated with inlaid glass and gold.\textsuperscript{22} Art historians have connected Donatello’s heightened interest in glass after 1453 to his contact with Venice’s active glass industry. Muranese glass was highly desired for practical and decorative
purposes, and in the late fifteenth century Marino Sanudo wrote in his description of Venice that every palace had windows made out of glass from Murano. One of the most prominent glassmakers in Murano was Angelo Barovier, who around 1450 helped develop a new technique for producing the exceptionally pure crystalline glass called *cristallo*, which was made through the super refinement of a mixture of silica (often from ground quartz pebbles), purified soda-rich plant ash, and manganese, which removed residual color from the mix. Both *cristallo* and other less refined types of glass were sometimes cast in bronze molds, a technique that mirrors the one that would have been employed in the production of glass copies of the *Chellini Madonna*. That Donatello worked increasingly with glass after spending time near Venice is not surprising, since, once he experienced the appearance and effects of an artistic medium, he often tested its potential immediately in a new project. After returning to Florence from Rome in 1433, for example, he received the commission to carry out a *cantoria* (singing gallery) for the Florence Cathedral and covered the background of its reliefs with the kind of mosaic work he would have seen in abundance in the early Christian churches of Rome. Indeed, his interest in the expressive power of various substances led him to experiment with a wide variety of media. During his career he produced works in marble, bronze (sometimes gilded), polychromed wood, sandstone, limestone, terracotta (often polychromed), terracotta and lead, stucco, and glass (often gilded)—and these are the substances used in only his securely attributed works. Vasari recognized his artistic versatility and adventurousness, writing that when it came to the creation of sculptures, Donatello “delighted in everything, and so he tried his hand at everything.” Chellini also characterized Donatello by his material versatility, describing him in his account book as a “singular and unique master of making figures of bronze, wood, and terracotta.”

**Wax, clay, and metal (bronze)**

The first major step in the production of any image in bronze is the execution of a model in wax, sometimes, as seems to have been the case with the *Chellini Madonna*, from a plaster or clay model. The wax model is then combined with clay or plaster, as the sculptor or founder coats the wax model with investment material before the bronze is melted and poured. Wax and clay, substances used in additive sculpture, long had associations with the divine creation of humanity in both pagan and Christian contexts. Countless ancient Greek authors, including Hesiod, Aeschylus, and Plato, recounted the story of the titan Prometheus, who, after disobeying the orders of Zeus when he stole fire from the Gods and gave it to mankind, created man by sculpting him from earth and water. While Greek authors describe the actions of Prometheus, the myth that recounts his role in the creation of man became widespread only as a result of the presence of the story in texts by Roman poets like Ovid,
Horace, and Catullus. In the *Metamorphoses* (1:82–3), for example, Ovid describes how Prometheus made mud by mixing earth with fresh water, and then with this mud sculpted a man in the image of the gods. Fourteenth-century manuscripts of the *Ovide moralisé* not only describe Prometheus’ act of sculpting the body of man, but also, drawing on the biblical narrative of creation, include images that show him employing a “spark of the divine fire” to give life to the inert clay form. In these later versions of the Prometheus myth, clay and fire lead to the formation and enlivenment of man, just as they can, in the hands of a skilled artist, bring about the creation of a sculpted form.

Of course, in the Judeo-Christian West, the most famous description of the use of clay to sculpt and create a man comes in the opening lines of the Bible’s book of Genesis (2:5–7), which state that, on the sixth day of creation, God caused springs to rise up out of, and cover, the dry earth. Together the water and earth made mud, and it is this mud that God uses to sculpt the form of the man he calls Adam. Theologians and commentators frequently stressed that Adam’s very name came from the Hebrew word for red clay (*adamah*), the substance out of which he was made. God’s acts in Genesis eventually, and perhaps inevitably, led to his characterization as a sculptor, and medieval exegetes repeated often the artistic analogy. The Jewish commentator Philo, in his *Questiones et Solutiones in Genesin et Exodum*, wrote that man was modeled “as by a potter,” with a body functioning as a pedestal and a head like a sculpted bust. Ambrose, in his commentary on the six days of creation, calls God a “craftsman and a painter of distinction” as he warns people not to alter their appearances since they are flawless artworks by virtue of their creation in the image of God, the divine artist who was himself physically perfect.

The manipulation and firing of wet clay in the production of an image of the Virgin and Christ child, or its model, reinforced a theological link often made between Adam and Christ, and Eve and Mary. “As by one man’s disobedience many were made sinners, so by one man’s obedience many will be made righteous,” wrote Paul in Romans (5:19), in order to call attention to the theological connection between Adam and Christ. Following his model, other theologians, like Tertullian, compared Eve and Mary: “Eve, who was a virgin and undefiled, having conceived the word of the serpent, brought forth disobedience and death. But the Virgin Mary received faith and joy, when the angel Gabriel announced the good tidings to her.” Firing soft, malleable clay, the material from which many domestic images of the Virgin and Christ were made, produced a hard, durable image and mirrored the theological idea that the Virgin and Christ—inviolable and unassailable—replaced Adam and Eve, the former made initially of clay and then given the breath of life, and the latter, although made from the flesh of Adam, impressionable, much like unfired clay itself.

The *Chellini Madonna* existed as an invested wax model before it was cast through the lost-wax method, which was commonly employed in fifteenth-century Italy. Wax came to assume specific theological
associations connected to its instant liquefaction when heated and its ability to register imprints easily. Psalm 68 (68:2), for example, compares heated wax to the wicked. According to this text, evil men respond to the truth of God’s word as wax does when heated: just as the soft substance liquefies and quickly disperses when warmth is applied, evil men melt away when presented with God’s truth. Both the baseness and impressionability of wax led theologians to link the material with the creation of Adam, a man made, according to the Bible, in God’s image and likeness (Genesis 1:26–7). Using a common characterization that relates ultimately to the metaphor of God as a sculptor, Gregory of Nyssa (fourth century), in his De Beatitudeibus, compared the creation of man in God’s likeness to the production of an impression in wax, since God “imprinted upon [man’s] constitution replicas of the good things in his own nature, as though stamping wax with the shape of a design.”

Ambrose too linked wax to the creation of man, highlighting the protean qualities of the material and its capacity to receive and register impressions. In his description of God’s creation of man, he encourages humans not to alter their own bodies since they are created “in the grace of God” and not “in mere wax,” an allusion to the fact that many theologians compared Adam to the form made when a stamp is pressed into the soft material.

If the wax employed to create a sculpture had ties to human creation, so did the metal that bronze sculptors used to cast their works. The link between metal and the creation of man ultimately derives from early Greek theories of how metals develop in the earth. Aristotle, in his Meteorologica, and Plato, in the Timaeus, understood metals, including bronze and gold, to be earthly substances born beneath the ground, and both philosophers explained the origins and physical properties of metals by claiming that they are watery in their natural state, but solidify when they rise to the earth’s surface after being heated. Lucretius, in the De rerum natura, a text rediscovered in 1417 by the Florentine humanist Poggio Bracciolini, proposed that humans discovered metals with subterranean origins (copper, gold, iron, silver, and lead) when a forest fire, which was begun by lightning or some action of humankind (he suggests as possibilities the setting of a fire to scare an enemy or to clear land needed for the cultivation of crops), burned down trees covering a great stretch of land, melted the metals contained in the ground beneath this patch of earth, and made them flow into hollows on the earth’s surface, where they solidified and revealed their useful presence. The first people, Lucretius states, picked up lumps of the various types of metals, and, because many of the pieces retained the forms of the earthly crevasses from which they were taken, realized they could fashion objects by pouring streams of molten metal into molds and then developed the idea of using the newfound substances and techniques to make weapons and tools. This story held sway throughout the Middle Ages. In the seventh century, for example, Isidore of Seville repeated verbatim Lucretius’ proposal about the discovery of metals.

The Christian poet Claudius Marius Victor, writing in the fifth century, first proposed a link between the discovery of metal and the
Judeo-Christian creation story when he claimed in his poem *Alethia* that Adam inadvertently discovered metals after being banished from the Garden of Eden. Victor’s contribution, which relies on Lucretius’ ideas, was to propose that Adam was the one who started the great fire when, in a fit of anger and frustration after his and Eve’s expulsion from the Garden of Eden, he threw a rock at the serpent who had tempted and tricked them. In Victor’s telling the rock missed the serpent and instead hit the ground and caused a spark that set a cluster of trees on fire, burned a clearing in the land, and in so doing revealed to Adam and Eve the presence of metals in the earth. The idea that Adam had a hand in the discovery of metals remained popular, and eventually evolved into the idea that the first human to understand the secrets of mixing and forging metals was Adam. According to the theologian Vincent of Beauvais (c. 1190–1264), the anonymous author of the *Book of Sidrach*, a thirteenth-century treatise written by a scholar connected to the court of Frederick II, and many others, Adam learned the arts of metalworking and alchemy from God after the Expulsion, and then passed down the secrets of these sciences to his Old Testament descendents. The biblical text never states that Adam was skilled in either of these areas—Genesis (4:22) identifies Tubalcain as history’s first blacksmith—but implies this was the case, for God punishes Adam after the first sin by expelling him from Eden and ordering him to work the land in order to produce food, a task impossible to accomplish without metal implements.

**Glass and light**

Ancient and medieval authors were as interested in the origins of glass production as they were in understanding the circumstances surrounding the discovery of metals. In his discussion of mosaics, Pliny the Elder explains that, for many centuries, glass was produced only in Phoenicia, a part of Syria bordering on the Roman province of Judea. There, Pliny says, a swampy lake located towards the base of Mount Carmel fed the Belus River, whose waters, although muddy and not potable, were considered holy and used in certain religious rituals. When the waters of this river ebbed after being churned by the current, they left on a half-mile stretch of shoreline especially pure and fine sand. It was the special sand from this small beach, Pliny claims, that was used for many years in the production of glass. He goes on to describe how, through serendipity, sailors discovered that this sand was especially useful in the process of making glass. According to Pliny, a ship carrying a kind of soda called natron, one of the three components used most often in the production of glass, stopped along the river so that the traders manning the boat could prepare a hot meal. Because they lacked stones to use as supports for their cooking pots, they set clumps of soda directly on the sand, and then put the pots atop the soda. They lit fires beneath the pots of food, which heated the food but also melted and amalgamated the sand and soda,
producing streams of molten glass that solidified in clumps and rings after the fires were extinguished. Modern translators point out obvious problems in Pliny’s account that make accepting or even considering it difficult, if not impossible. He never reveals, for example, where the sailors obtained lime, one of the three components needed to make glass. And he does not explain how a mere campfire became hot enough to melt and combine sand and soda, which happens when the mix reaches about 1500˚ Celsius. But the explanation held weight, and was repeated by commentators throughout the Middle Ages, including Isidore of Seville, who, in his *Etymologies*, repeated almost verbatim Pliny’s account when describing the discovery of glass, a substance that is translucent and thus, Isidore states, “transmits light to one’s sight.”

Pliny’s identification of the site of the discovery of glass—the banks of a river that originated in a swamp located near the base of Mount Carmel—imparted to glass an association with the Virgin Mary through an unexpected connection to Carmelite beliefs about the foundation of their order. Mount Carmel was claimed by the Carmelites as the home of their founders, the Old Testament prophets Elijah and Elisha, who first play a role in the foundation myth of the order in thirteenth-century texts. According to legends developed by the Carmelites in the early fourteenth century, like the one found in the *De inceptione ordinis*, a history of the order written around 1320, Mount Carmel had a special connection to the cult of the Virgin and was home to a church built by hermits and dedicated to her sometime after the Incarnation. Subsequent elaborations of the early history of the Carmelite order, like those presented by John Baconthorpe in the 1320s in the *Speculum de institutione ordinis pro veneratione beatae Mariae* and *Laus religionis Carmelitanae*, contained the claim that hermits living on Mount Carmel venerated the Virgin even before her birth. Thus Mount Carmel, according to Pliny’s story about the invention of glass and because of Carmelite beliefs concerning the sacred connection between the home of their founders and Mary, gave birth to glass and to the earliest veneration of the person and cult of the Virgin Mary. Perceptive readers aware of the claims of Pliny and later writers who repeated his influential story, as well as Carmelite beliefs, would have seen in the two accounts a point of connection between glass and the Virgin Mary, and perhaps wondered if the discovery of glass near Mount Carmel had some connection to the sacred person of the Virgin, who was so venerated at Carmel. The sands deposited by the Belus and used to produce the first glass were, after all, considered by Pliny to have been especially pure, and to have been carried and deposited by sacred waters.

There are few mentions—literal or figurative—of glass in the Bible, and it is never compared to any holy figure. One of very few references is found in the book of Revelation (21:18), which highlights the purity of glass as it describes the heavenly Jerusalem, a city made of gold “as pure as glass” and with a main street constructed of gold as spotless as “transparent glass” (21:21). Still, a connection between the Virgin and glass was developed extensively by theologians throughout the Middle Ages and became a fundamental part of a
simile used frequently to describe the Incarnation and birth of Christ. Millard Meiss long ago called attention to the tendency among medieval theologians to compare the Virgin to a spotless glass window penetrated by a beam of sunlight, itself symbolic of the word or spirit of God during the conception of Christ or his birth. The origins of this comparison can be traced to the New Testament and Christ’s famous statement (John 8:12) that he is the light of the world (“ego sum lux mundi”), a phrase paired with depictions of Christ in numerous medieval church apses. The comparison of the Virgin to a glass window, and the word or spirit of God during the Annunciation or birth of Christ to a beam of sunlight that passes through a window yet is not altered in form or size, had been fully developed by theologians by the ninth century, and can be found in texts of Peter Damian, Hildebert of Lavardin, and William of Champeaux. In the twelfth century, Bernard of Clairvaux explained in clear terms the essence of the simile:

Just as the brilliance of the sun fills and penetrates a glass window without damaging it, and pierces its solid form with imperceptible subtlety, neither hurting it when entering nor destroying it when emerging: thus the word of God, the splendor of the Father, entered the virgin chamber and then came forth from the closed womb.

In Bridget of Sweden’s fourteenth-century Revelations, Christ addresses Bridget directly and refers to himself exactly as medieval theologians described him:

I have assumed the flesh without sin and lust, entering the womb of the Virgin, just as the sun passes through a precious stone. For as the sun, penetrating a glass window, does not damage it, the virginity of the Virgin is not spoiled by my assumption of human form.

This simile, as Bernard and the imagined Christ of Bridget’s vision explain, simultaneously described both the Annunciation and the birth of Christ: the spirit passed into and through Mary when God announced to her that she would bear his son, and then passed from her when she gave birth. Writers continued to think deeply about the comparison of the Virgin to glass and the word or spirit of God (as embodied by Christ) to light, and the birth of Christ eventually came to be seen not as akin to light passing utterly unaffected through glass, for the Virgin was understood to have played a role in the Incarnation—to have affected the ray of light in a significant manner—by giving Christ a human form. Thus, as Meiss stresses, theologians came to describe the Virgin not as a pure and colorless sheet of glass, but as a piece of colored glass that tinged the light’s beams. A passage once attributed to Bernard of Clairvaux explains the idea, which was embraced and discussed by numerous writers in the thirteenth century:

As a pure ray enters a glass window and emerges unspoiled, but has acquired the color of the glass ... the Son of God, who entered the most chaste womb of the Virgin, emerged pure, but took on the color of the Virgin, that is, the nature of a man and a comeliness of human form, and he clothed himself in it.
Appropriately, theologians came to understand the color of a light ray to be the protean element of the simile. Modifying the shape, power, intensity, or direction of a light ray was to alter its essential substance, while changing its color modified a purely aesthetic feature that led to an actualization or visualization of the light's form but did not change its essential position or structure, just as, according to Christian belief, the Incarnation made God’s word or spirit tangible and visible.

While theologians called on the visual and tactile qualities of glass and light to explain the conception and birth of Christ, the simile was not merely theoretical, for the effectiveness of much church ornamentation, especially stained-glass decoration, relied on the worshippers’ recognition of the theological meaning of glass and light. Already in the early twelfth century Abbot Suger, in his descriptions of the artistic and architectural additions he supervised at the abbey church of St.-Denis, made clear the effect light had on him. He stressed the appearance of gleaming gems and how the colored light they emitted transported him—and, presumably, other worshippers too—to an immaterial realm. His poetic church inscriptions, influenced by his contemplation of a theology of light developed by Pseudo-Dionysius the Areopagite, describe the effect on the church’s interior of the inclusion of glass windows in the new choir whose construction he oversaw in the 1120s and 1130s.\textsuperscript{6} Once added, he said, the new additions made the church glow, “its middle part brightened … by the new light.”\textsuperscript{6} As Erwin Panofsky stressed, for Suger and his contemporaries this new light—the “lux nova”—stood for both the newly present physical light and the divine light symbolized by Christ.\textsuperscript{63} For Suger, the light transported him from one state to another, and the implication is that it not only affected his mental state generally, but passed into his mind and body to cause the result he describes so evocatively.

Light and vision

It is impossible to know how or where a glass copy of the Chellini Madonna would have been displayed, but if placed next to candlelight or a window, the glass would have refracted, bent, and perhaps tinged with color the light that illuminated it, producing a glow around the roundel, an effect visible today when light illuminates the modern glass copy. Light, unlike the wax, bronze, and glass used in earlier stages of the work’s production, could have been directly engaged in numerous ways—light was seen, felt, and, as we shall see, even thought to be physically absorbed—by a viewer standing in close proximity to the tondo. Imaginative viewers of the Chellini Madonna might have understood that what they saw before them recreated the simile made familiar by medieval writers: light passing through glass was like the word or spirit of God after it entered into or emerged from the Virgin. The effect would have been heightened had the Chellini Madonna been cast in colored glass, since a glass version would have produced a colored light that evoked Christ incarnate.
For fifteenth-century viewers familiar with optical theory, the act of looking at light involved its direct internalization. This happened through sight, a process whose steps ancient and medieval philosophers debated extensively. At issue for all who entered the discussion about how vision works was whether it occurs by intromission or extramission, namely, whether the eye sees through the absorption of a substance or an essence released by the image, or by emitting some entity that secures a component of a viewed object and returns it to the eye to be processed. Plato first developed a version of the extramission theory, proposing that images are captured when a stream of “fire” leaves the viewer’s eye and combines with sunlight to form a “homogenous body” that then comes into contact with an emanation from the object being seen. Aristotle, who provided the first comprehensive discussion of vision, disagreed with the extramission theory and proposed a version of intromission as the likely explanation for how sight happens. The color of an object, he claims in De anima, “moves the transparent medium, e.g., the air, and this, being continuous, acts upon the sense organ.” Aristotle paid special attention to the role of light, which he defined as dependent upon the ability to see an object: light exists when one visualizes an object located in air, water, or any other substance through which the human eye can see. For both Aristotle and Plato, a viewed object does not alone produce an image in the mind of the viewer; rather, it is the interaction of the object with the medium in which it exists that creates a continuous chain of some substance between the entity being scrutinized and the eye, and the presence of this chain allows an object to be seen and then comprehended by the mind. Although differing in their ideas about how vision happens, both Plato and Aristotle believed that the visual process leads to the establishment of a physical connection between the object seen and the eye.

During the Middle Ages, philosophers took up the debate between intromission and extramission. Many, including Avicenna in his Canon of Medicine, a book included in Chellini’s library, argued strongly in support of intromission. Medieval optical and medical treatises frequently explored the anatomy of the eye, and Avicenna’s discussion of ocular structure, which derives from that first proposed by Galen, gave him an opportunity to explain how images, carried by a substance he calls the “visual spirit,” pass through the eyes and reach the mind:

The substance of the visual spirit penetrates the eye, by way of the two hollow and concave nerves about which anatomy has taught you. When the nerves and their coats reach the orbits [of the eyes], the extremity of each is dilated and enlarged so that it encloses the humors of the eye, the central one of which is the glacial [or crystalline] humor, which is as clear as a hailstone. The glacial humor is round, but its roundness is diminished in front by compression; and it is compressed so that the image formed on it might be of more suitable size and so that small objects that are observed might have a larger place on which to form [their images].
For Avicenna, different parts of the eye accommodate the various stages in the visual process. Sight happens through intromission as the “substance of the visual spirit” moves through the “nerves” to the center of the eye, where it settles on the glacial humor before proceeding to the brain or intellect, a destination Avicenna alludes to but does not mention.

One of the strongest defenses of intromission can be found in the works of the tenth- to eleventh-century Persian physicist and mathematician Ibn al-Haytham, known as Alhazen. His treatise on optics, the Kitāb al-manāzir, translated into Latin as the De aspectibus or Perspectiva, was inarguably the most influential optical treatise during the Middle Ages. Every major theorist who worked on optics after the eleventh century, including Roger Bacon, Leonardo da Vinci, and Johannes Kepler, was familiar with Alhazen’s text. His treatise was particularly well known among artists and physicians in Chellini’s Florence. Ghiberti included extensive sections of it in the third book of his Commentaries, compiled around 1450. Leonbattista Alberti knew Alhazen’s ideas, probably through his reading of works by Biagio Pelacani. In his discussion of intromission, Alhazen, harking back to Aristotle, stresses the link between light and vision:

Sight … perceives nothing about visible objects unless they are illuminated; the form of the visible object that sight perceives depends entirely upon the light possessed by that visible object, as well as upon the light that shines upon the eyes when that visible object is perceived, and upon [the light that illuminates] the aerial medium between the eyes and the visible object.

Light and color, in Alhazen’s formulations, allow a person to see a thing. But what of instances when a person observes a luminous body emitting light broadly, and not merely a concrete object illuminated just enough to be discernible? Alhazen specifically addresses such possibilities, as when, for example, light emanates from the sun or a candle:

When the eye faces any visible object that shines with some sort of illumination, light from that visible object will shine on the eye’s surface. And it was shown that it is a property of light to affect sight, whereas it is in the nature of sight to be affected by light. It is therefore fitting that sight sense the luminosity of a visible object only through the light that shines from it upon the eye.

Alhazen devoted special attention to especially bright candlelight or sunlight, since according to him they affect the eye in tangible, felt ways and thus prove unequivocally that light, or some component of it, does indeed enter the eye and act on it physically. He explains in detail the potential effect of bright light on the eye in the context of his defense of intromission:

We find that when our sight fixes upon very strong light-sources it will suffer intense pain and impairment from them, for when an observer looks at the body of the sun, he cannot do so properly because his vision will suffer from its light. By the same token, when he looks at a polished mirror flooded with
sunlight, and his eye is placed at the spot to which the light from that mirror is reflected, his vision will also suffer from the reflected light reaching his eye from the mirror, and he cannot open his eye to look at that light.  

Alhazen makes clear the effect of light on the sensate eye, and, as David Lindberg stresses, calls attention to the fact that “looking at bright light or color leaves an impression in sight, which lingers for a long time before fading away.” Alhazen’s investigation of the effect of bright light on the eye supports his defense of the intromission theory and relies on the examination of the most fundamental kind of sight, where a viewer perceives not an illuminated form, but simply light, or some component of it, as it emerges from a source.  

In his treatise On Light, Alhazen continued this line of investigation, distinguishing between forms that are “self-luminous” and those that are illuminated by external sources in order to determine the nature of the substance that carries the image to the eye and mind. For Alhazen, in both cases it is “the form of light and color that is transmitted from the visible object to the eye, where it endows the glacial humor with the qualities of the visible object.” Alhazen did not believe that the appearance of a viewed object—whether self-luminous or illuminated by an outside light source—is perceived through the eye’s reception of any particular particle or physical object, and could claim only that intromissive sight happens through the reception of some nameless force or element comprised of components or derivatives of light and color. Even if he did leave undefined the nature of the element or power that enters the eye during vision, his discussion of the effect of light, and especially bright light, on the eye during the process of sight makes clear his belief that along with some element of color, an aspect or part of light, or something derived from its essential substance, directly affects and enters the eye of a viewer as he or she looks at an object.  

**The Chellini Madonna: Vision and devotion**  

For fifteenth-century viewers, to view a painting or sculpture of Christ through the process of intromissive sight was thus to absorb into the eye and mind the color and light that defined the work and made it visible. The Chellini Madonna offered a different viewing experience. Placed next to a window or candle, the glass tondo would have filled the space in which it was placed with light that was altered—refracted, suffused, and perhaps colored—after having passed through the glass. The mere presence of the glass and light, substances that “negotiate[d] between the world of matter and the world of spirit,” would surely have evoked the Annunciation and Incarnation in the minds of those familiar with basic theological tenets. Viewing the light that emanated from the tondo not only activated one’s imagination of biblical history, but also involved the physical intake, through sight, of a substance that represented the word or spirit of God and Christ, and evoked both in an
immediate way. To view the glass copy of the *Chellini Madonna* was very much like participating in a mass and accepting into one’s body the host, though when receiving Communion the substance consumed had, in the minds of believers, become Christ’s body. Light was not literally Christ, but could symbolize him in certain contexts, and thus, when absorbed by the eye, could trigger memories and thoughts of the sacrament of the host and the salvation that it promised to Christians. Popular belief regarding the significance of seeing the consecrated host perhaps would have encouraged this mode of thinking, for some considered the act of viewing the host as akin to its consumption. In fourteenth- and fifteenth-century Florence, people rushed to churches when the consecrated host was raised in order to catch a glimpse of it. When the city came under papal interdict in 1376, many citizens tried to convince members of a special council to urge the city’s clergy at least to display the consecrated host, even if Communion could not be given.

If glass and light, potentially the ultimate products of Donatello’s roundel, evoked the Virgin, the Annunciation, the Incarnation, and Christ himself, how might we read the materials used in earlier stages of the image’s production? To start with wax and clay, the materials employed to make the model from which the bronze was cast, was to begin with materials tied to God’s creation of Adam, a man made out of the clay of the earth and in the minds of some theologians equivalent to an impression of God made in wax: different in matter yet identical in general appearance and form. To pour bronze into the mold was to introduce a component connected to the earth and associated with Adam and his actions after the Temptation and Expulsion. Making a metal image from a wax form invested and immersed within a clay shell thus meant moving, in a symbolic manner, from the earliest moment of the creation of Adam to the time after the sin of Adam and Eve and their expulsion from the Garden of Eden. The final material (potentially) used to make the roundel, glass, was quite literally associated with the Virgin Mary, and transitioning from metal to glass—from a substance associated with the earth and Adam and his transgression to one symbolic of the Virgin Mary and her purity—was to repeat and recall the essence of the broad Christian narrative in which Adam and Eve’s actions necessitated the birth of the Virgin and Christ, who together made possible the redemption of man and the removal of the stain of the original sin.

Barring further discoveries of documents or copies of the *Chellini Madonna*, one cannot know whether it was cast in glass in the years just before or after 1456. Had it indeed been made in glass, the glass roundel and the light it emitted would have represented the final products in a long artistic process that started with the manipulation of wax and ended with the presence of light. Chellini, an astute patron, had all the intellectual training needed to comprehend the steps involved in this evolution. He likely understood bronze casting, if not from conversations with artists like Donatello, then certainly from texts in his library. On Chellini’s shelf, for example, was Diogenes Laertius’ *On the Lives of Philosophers*. In Aristotle’s biography, Diogenes compares
the philosopher’s ideas about the soul to a wax model and the finished bronze statue it produces: the soul can potentially or actually exist just as, he says, a sculpture potentially exists in raw wax and bronze and actually exists when cast, cleaned, and chased. And in Aristotle’s famous discussion of entelechy in the *Physics* (2:3), another book Chellini owned, Aristotle compares the requirements for actuality or existence, namely, the presence of material, a form, a force that forges it, and a guiding purpose for the object, to the modeling and casting of a bronze sculpture. In addition to his understanding of bronze casting, from his medical books Chellini would have gained a detailed knowledge of the workings of the eye according to theories widely accepted in the fifteenth century. Some of the most influential discussions of ocular anatomy and sight were found in medical treatises by Galen, Avicenna, and Joannitius, all of whom were represented in Chellini’s library.

There are few surviving accounts of personal interactions with domestic images like the *Chellini Madonna*, but in interpreting the significance of the media used in its facture it is helpful to recall that in Giovanni Morelli’s diary, written between 1393 and 1421, the themes of sin and redemption play a crucial part in Giovanni’s description of his domestic devotional practices, which sometimes took place in the presence of a painting of the Crucifixion. In June 1406, exactly a year after his oldest son Alberto’s death, Giovanni reports that the pain of losing him was undiminished and that his son’s soul was not at rest, perhaps, he feared, because no priest was present when the boy died. In desperation, Giovanni knelt before the painting located in his bedroom and started to pray, first to Christ, and then to Mary and John the Evangelist, who were, presumably, depicted in their usual positions in the painting—Mary to Christ’s proper right, John to his left. The core of Giovanni’s devotional experience is a long prayer addressed to Christ, which starts with his admission of his own sinfulness and a consideration of its effect on his son, and concludes with the request that Christ bless Alberto’s soul and accept it into heaven:

O most holy and sacred Father, Son, and Holy Spirit, in whose majesty, divinity, and unity holy paradise and the whole world shines and is resplendent [*allumina e risprende*], concede to your lowly servant and faithful Christian enough of your infinite grace so I can say those words in your praise and honor that merit reaching your presence. In your mercy make them favorable to the blessed soul [of Alberto], which I earlier received as a gift from you, and which, as desired, should be beatified in your presence.

Giovanni heard, in his mind, Christ’s reply: “I wanted to be crucified,” asserts an imagined voice, “so that, in the view of [God] the father, the price to save everyone would be just.” Giovanni continued to pray, admitting again his own sinfulness and that of his son, stating that Christ is God incarnate, as was proclaimed at the Annunciation, which he recounts in his mind from the gospels’ descriptions, and recalling Christ’s ascension to heaven, when he was surrounded by the “excitement and splendor and great joy and happiness of
the holy angels.”

This kind of personal prayer, which must have been said frequently by Florentines in an age of high infant and child mortality, reveals to us the types of thoughts believers expressed as they approached domestic devotional images in search of intercession or aid. In the words he says to Christ, Mary, and John, Giovanni calls attention to his and his son’s sinful state, yet holds out hope that salvation is possible through the intervention of the Virgin, John, and, most importantly, Christ, whom Giovanni specifically calls God incarnate and describes as illuminating the whole world with his majesty. Reading the *Chellini Madonna* materially—from light to glass to bronze to wax and clay, and then in reverse—would have prompted, accompanied, and enriched a prayer like the one Giovanni records in his diary, which touches on all the major themes and events evoked by the substances used to create the Chellini roundel: the sinful state of man, which was brought about by the actions of Adam and Eve; the role of Mary as mother of God; the Annunciation and Incarnation; and Christ’s role as savior. When placed in a room and illuminated by light, the sculpture would have effectively structured the devotional process that accompanied domestic images like the painting Giovanni Morelli turned to in a time of spiritual need.

Two centuries after Donatello made the *Chellini Madonna*, Gianlorenzo Bernini also experimented with light and made directed illumination an essential element of his decorations for the Cornaro Chapel in Santa Maria della Vittoria in Rome. As in the case of Bernini’s chapel sculptures, Donatello’s manipulation of light in the *Chellini Madonna* added to the sensual beauty of the artwork. But unlike Bernini’s use of light, Donatello’s light was not meant primarily to dramatize a scene and in so doing separate it from human experience, but rather to personalize the image and the individuals depicted in it, and to make the viewer’s experience of it, and, by extension, of the holiest figures in Christian belief, more intimate.

Notes

Chellini Madonna in Giovanni Chellini’s house, and a description of its placement in the home of one of his descendants, see Brenda Preyer, “The Florentine Casa,” in Marta Ajmar-Wollheim and Flora Dennis, eds., At Home in Renaissance Italy (London: V&A Publications, 2006), 34–49, 47–8.


3 Chellini, Le ricordanze, 218: “e del lato di fuori cavato per potervi gittare suso vetro strutto e farebbe quelle medesime figure dette da l’altro lato.”

4 Radcliffe and Avery, “The ‘Chellini Madonna’ by Donatello,” 382.

5 It is possible that using the bronze roundel to cast a glass copy would have damaged the gilding on the obverse; see Donal Cooper and Marika Leino, eds., Depth of Field: The Place of Relief in the Time of Donatello (Leeds: Henry Moore Institute, 2004), 87. It is impossible to know when the gilding was added.

6 Radcliffe and Avery hypothesize that executing the work involved at least five major steps: the modeling of the relief in wax on a turned wooden plate; the creation of a plaster mold comprised of negative impressions of the roundel’s obverse and reverse, joined precisely together; the production of a solid wax model of the tondo within the plaster mold; the investment of the wax model; and, finally, the casting of it in bronze. On this process, see Radcliffe and Avery, “The ‘Chellini Madonna’ by Donatello,” 377, n. 6.

7 The landscapes in Donatello’s schiacciato reliefs reveal his enduring interest in the depiction of air or atmosphere when illuminated by light. On this, see Amanda Lillie, “Sculpting the Air: Donatello’s Narratives of the Environment,” in Donal Cooper and Marika Leino, eds., Depth of Field: Relief Sculpture in Renaissance Italy (Bern: Peter Lang, 2007), 97–124.

8 The theological significance of light will be discussed below. For a brief discussion of light and art, see the short, general essay by Hans Sedlmayr, Das Licht in seinen künstlerischen Manifestationen (Mittenwald: Mäander Kunstverlag, 1979); and on uses and interpretations of light in medieval art, see Graziella Federici Vescovini, “Luce,” in Enciclopedia dell’arte medievale (12 vols., Milan: Nuova Arti Grafiche Ricordi, 1997), vol. 8, 25–35.


11 The following list of books in Chellini’s library comes from various entries in his diary, as well as Park, Doctors and Medicine, 192–7, 193, n. 14.
Ibid., 197–8.


17 Ibid., 96.

18 To complete the panel he entered in the contest to win the commission for the Florence Baptistry’s second door in 1401, Ghiberti used the lost-wax method and attached extra pieces that had been cast solid and separately, including the figure of Isaac and the hand of Abraham. The most recent in-depth studies of early fifteenth-century bronze casting have been done in connection with the restoration of Ghiberti’s *Gates of Paradise*; see Gary M. Radke, ed., *The Gates of Paradise: Lorenzo Ghiberti’s Renaissance Masterpiece* (London and New Haven, CT: Yale University Press, 2007), 141–82.

19 As Janson points out, documents published by Giuseppe Poggi state that Donatello and Ghiberti submitted designs for this project, and that Donatello’s, once selected, was carried out by Domenico di Piero and Angelo Lippi, two artisans skilled in making stained-glass windows. See Janson, *The Sculpture of Donatello*, vol. 1, xiii.


21 Radcliffe and Avery, “The ‘Chellini Madonna’ by Donatello,” 382.


24 On Barovier, see Luigi Zecchin, “Angelo Barovier, vetroai del Rinascimento,” *Vetro e silicati* 10:58 (July-Aug. 1966), 23–6. On Barovier’s development of


26 On this possibility, see Michael Greenhalgh, *Donatello and His Sources* (New York: Holmes and Meier, 1982), 107–8.

27 Donatello’s use of various media has been stressed and explored in Bennett and Wilkins, *Donatello*, 96–134.


37 Evans, *Paradise Lost and the Genesis Tradition*, 100.

38 As quoted in ibid., 100–101.


41 Ambrose, *Exameron*, 238: man is a picture, “non cera expressam sed gratia.”


49 Ibid., 150, note d.

50 Isidore of Seville, *Etymologiarum sive Originum*, vol. 2 (bk. XVI, ch. xvi, 1–2).


52 Ibid.


56 Meiss, “Light as Form and Symbol,” 177.
Quoted in ibid., 176.

Quoted in ibid., 177.

Ibid.

Ibid., and attributed to Bernard by Meiss. Alison Luchs kindly pointed out to me the controversy surrounding this excerpt, which likely does not derive from any text written by Bernard. On this, see Alison Luchs, “Stained Glass above Renaissance Altars: Figural Windows in Italian Church Architecture from Brunelleschi to Bramante,” Zeitschrift für Kunstgeschichte 48:2 (1985), 177–224, 221, n. 17. Meiss stresses, logically enough, that this new comparison between the Virgin and colored glass was influenced by the development of the art of stained glass in churches, and the presence of pools of colored light inside churches in late medieval Europe.


I have consulted Suger’s account in Panofsky’s edition and translation. For the poem from which these few words derive, see Panofsky, Abbot Suger, 50–51: “Pars nova posterior dum jungitur anteriores, / Aula micat medio clarificata suo. / Claret enim claris quod clare concopulatur, / Et quod perfundit lux nova, claret opus / Nobile, quod constat auctum sub tempore nostro, / Qui Suggerus eram, me duce dum fieret.”


Ibid.

As quoted in ibid., 7.

Ibid., 7–8.

Avicenna, Liber canonis (Venice: Paganino de Paganini, 1507; anastatic reprint Hildesheim: Georg Olms, 1964), bk. 3, fen. 3, c. 1. This translation is modified from Lindberg, Theories of Vision, 51.


Ibid., vol. 2, 355–6 (bk. 1, ch. 7).

Ibid., vol. 2, 343 (bk. 1, ch. 1).
75  Lindberg, *Theories of Vision*, 62.

76  Ibid., 78–9.

77  Ibid., 79.


80  For a literary representation of this practice, see Gianfranco Folena, ed., *Motti e facezie del Piovano Arlotto* (Milan: Riccardo Ricciardi, 1953), 81–2.


86  Trexler, “In Search of Father,” 189, and *Mercanti scrittori*, 304.

87  Trexler, “In Search of Father,” 189, and *Mercanti scrittori*, 305.

88  Trexler, “In Search of Father,” 190, and *Mercanti scrittori*, 305.


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Perception as a function of desire in the Renaissance

John S. Hendrix

*De amore*, or the *Commentary on Plato’s Symposium*, was written in 1469, after Marsilio Ficino had finished translating the works of Plato for the Medici family. It was not published until 1484, when it was included with Ficino’s translations of Plato’s works from Greek to Latin. Ficino’s definition of beauty follows the Platonic definition as depending on a universal principle—that is, as given by language. According to Ficino, that which pleases the soul must be an incorporeal beauty, a conceptual representation not based in sense perception. In *De amore*, II.9, “beauty of the soul also is a splendor in the harmony of doctrines and customs,”1 in the matrix of language which creates the identity of the subject in terms other than sense perception. Desire in *De amore* is not a physical, instinctual desire, but a desire created by language in the construction of perception. In II.2: “For it is the same God whose beauty all things desire, and in possessing whom all things rest. From there, therefore, our desire is kindled.” Desire is governed by knowledge of God, knowledge of the archetypal principle in language. Perception, and judgments of beauty, are governed by the desire which is a function of language. Perception and desire are constructed through language. The desire for the good in the *circuitus spiritualis* through the hypostases is that which governs artistic expression.

The hypostases are described in the first speech in *De amore*, delivered by Giovanni Calvalcanti, a friend of Ficino’s, to explain the speech made by Phaedrus in the *Symposium* of Plato. The hypostases are the Angelic Mind, the World Soul, from Plato, and the World Body. God himself is not accessible to the hypostases, as He is infinitely simple, and not of the world, which is necessarily multiple, and ornamental, that is, a product of perception. Both the ornamental machine of the world and the ideas behind the machine are created by the inaccessible God, just as the archetypal forms are created by the children of the demiurge in the *Timaeus*. The inaccessibility and infinite simplicity of the origin are qualities of the One of Plotinus. The world prior to the creation of forms is chaos, formless and dark. Chaos turns to order through the creation of the substance of the mind, the archetypal idea, which
is its essence. The essence, which is itself formless and dark, is imbued with a desire to “turn towards God,” as it is born from God. The essence of mind, the archetypal idea, is in Plotinus the Intellectual, that part of mind which understands the intelligibles, and in which the divine idea participates.

Sensible objects have no connection with each other, or with the perceiving subject. Without the ordering process of reason and perception, of which language is a function, the sensible world would not exist. Desire for God, or order, is a desire for human reason in relation to the sensible world, a validation of human thought in relation to the sensible world. “Turned toward God,” Calvalcanti says, the essence of mind, or the Intellectual Principle, “is illuminated by His ray,” and the appetite or desire of the intellectual is increased by the splendor of the ray. As the intellectual reaches toward God in its desire, “it receives form. For god, who is omnipotent, imprints on the Mind, reaching out towards Him, the nature of all things which are to be created.” In perception, the mind creates the form of all things perceived prior to the actual perception, prior to the making of the imprint of the sensible object in the eye. The imprint is determined a priori by reason, not in conscious reasoning, but in the essence of mind, which is the intellectual of Plotinus. The concept that the form of the imprint of the sensible object is determined prior to the perception of the object can be found in the writings of Plotinus.

In De amore, everything which is perceived is painted on the Angelic Mind, from which are created the forms of all sensible objects, the spheres and the vapors, like the archetypal forms which are created by the children of the demiurge of Plato. The forms of things are conceived in the celestial mind, and are called the Ideas, as they are in the Timaeus. The form of each type of sensible object is given a mythological character, to reinforce the fact that the forms are products of the celestial mind, that they determine perception of the sensible world, rather than being determined by it. The form or idea of the heavens, or the sphere of the fixed stars, is Uranus. The forms of the first two planets are Saturn and Jupiter. The form of fire is Vulcan, the form of air is Juno, the form of water is Neptune, and the form of earth is Pluto. Without the ordering of the sensible world by reason in perception, the world would only appear as disconnected chaos. Such perception is a function of the desire created in mind by reason itself for the operation of the human being in the sensible world, which depends on its ordering by reason, but in a process which is inaccessible to reason itself, which escapes the self-consciousness of reason, and is thus a function of the essence or intellectual.

The first turning of the essence of mind to God from chaos is the birth of love, the infusion of the illuminating ray of God is the nourishment of love, and the forming of the ideas is the perfection of love. The forms and ideas of the intellect form a mundus or cosmos, which is the ornament, and the grace of the ornament is beauty. That which is most beautiful in the sensible world is that which most conforms to the forms and ideas in intellect, as the form and idea interact with the imprint of the sensible object in perception. Love attracts the mind to the beautiful, and allows the mind to become beautiful,
as it becomes more aware of the divine idea. The beauty of the ideas in the mind corresponds to the beauty of sensible objects, because it is the ideas in the mind which form sensible objects. Thus “the mind is turned toward God in the same way that the eye is directed toward the light of the sun,” in which it perceives the colors and shapes of things, which are formed from the inner light, which is the basis of the imagination.

As the mind looks toward the illumination of the divine idea, “it is informed with the colors and shapes of things,” to which the sensible world conforms in the process of perception. Perception is a mechanism of the desire of the divine idea, the intelligibles, which order the sensible world, and allow it in turn to be loved by the perceiver. One loves to look at nature because one loves the way that it conforms to their idea of the order of the world, as in mathematics and geometry. One loves the sensible world because it reinforces intellect, and the inaccessible source of the generation of ideas within it. The World Soul, the structure of the cosmos, turns toward the same ideas, from formlessness and chaos, and its turning is caused by love also. The world around the subject desires what the subject desires. The world becomes a world when it has received the forms from the mind, that is, when it is perceived. Without love, without the subject being present to perceive it, the world would just be formless matter, disconnected and haphazard. But love is innate in it, and it turns toward order.

Love is the desire for beauty in *De amore* I.4, for “this is the definition of love among all philosophers.” Beauty is a threefold grace which originates in harmonies: the harmony of virtues in souls, the harmony of colors and lines in bodies, and the harmony of tones in music. Harmony in soul is known by intellect, harmony in body is known by visual perception, and harmony in sound is known by aural perception. It is through the intellect and perception that love is satisfied, as opposed to through bodily functions. The harmony in intellect corresponds to the harmony in vision and sound. The visual form of a work of art corresponds to the form of the ideas in the mind, and is thus considered beautiful, and incites desire, for beauty in form and virtue in mind. The work of art is successful if it incites that desire, the desire for God, and never satiates that desire, as desire for the infinite and inaccessible can never be satiated. Thus the viewer would always have the desire to return to the work of art, and see it again, because it conforms to the desire of the intellect for the good, or the idea of forms which orders the world in perception, and language as well, as a function of perception.

The “beauty of the human body requires a harmony of different parts” in the same way that perception requires a harmony of forms and colors and language requires a harmony of words in a syntax. The harmony of the different parts of the body is itself a syntax. The form of each sensible object in perception which is shaped by the idea in the imprint is seen as a sign, or a signifier, as in language. To the signifier as form corresponds an idea, in the intellectual, as signified, just as an idea corresponds to a word in language. The sign in perception, a head or leg in a body, for example, corresponds to
an idea of the head or leg in the intellectual. The harmony of the parts of the body is not given by the body, but by perception and intellect, as a function of desire; without the perceiver, the body is a chaotic, disconnected, arbitrary assemblage of parts, which in the Renaissance would be defined as the ugly.

Love, and desire, are functions of the graces, in intellectual, visual, and aural harmony. The “appetite which follows the other senses is not called love, but lust or madness.” Love between two people is a mutual desire for beauty, a reciprocal understanding of what beauty is, in both body and intellect. In De amore II.9, love of the body is only in the visual perception of the body, in the beauty of the “splendor itself in the ornament of colors and lines.” The “desire to touch is not part of love … but rather a kind of lust and perturbation of a man who is servile.” Love in intellect is a mutual desire for those laws and customs which are seen as harmonious and beautiful. “Beauty of the soul also is a splendor in the harmony of doctrines and customs.” Platonic love, the idea of Ficino and not Plato, is the reciprocal desire for beauty in soul, the shared love of God.

When “we are attracted to a certain man as part of the world order,” as Carlo Marsuppini, a student of Ficino, suggests in the fifth speech of the Commentary on the Symposium, we find the person beautiful in so far as they conform, either physically or intellectually, to our idea of beauty as it exists in and is defined by the matrix of laws and customs in which we operate, that is, the ornament of the world, the cosmos. In V.5, we are attracted to that certain person “especially when the spark of the divine beauty shines brightly in him,” that is, his form corresponds to the light in our imagination. We find a person beautiful when “the appearance and figure of a well-constructed man correspond most closely with that Reason of Mankind which our soul received from the author of all things and still retains.” Beauty is in the eye of the beholder, and beauty is culturally conditioned.

As the beauty of a sensible object depends on its correspondence with the form of the imprint in perception as determined by the idea, “it happens that the external form of a thing, striking with its image the Form of the same thing depicted in the soul, either disagrees or agrees with it ….” Whether the sensible object agrees with the form of the imprint or not depends on “a certain natural and hidden incongruity or congruity,” and then “moved by this hidden opposition or attraction, the soul either hates or loves the thing itself.” The hidden quality is that part of mind which is not accessible to discursive reason, the active intellect of Aristotle, or the Intellectual Principle of Plotinus. The intellectual is the higher part of mind which is able to understand intelligibles, ideas in forms which are not apparent to logic or conscious reason. Marsuppini paraphrases Enneads I.6.2 and V.3.3 of Plotinus.

At the end of his speech, Marsuppini asks if “anyone asked in what way the form of the body can be like the Form and Reason of the Soul and Mind, let him consider … the building of the architect.” The harmony of proportions of the work of art corresponds to the harmony of proportions in music, and the harmony of proportions in mathematics and geometry, instruments of
the *explicatum* or unfolding of the intelligibles in intellect into the forms of discursive reason, as elaborated by Nicolas Cusanus. The analogy of the building of the architect, taken from the tenth book of the *Republic* and the sixth tractate of the first book of the *Enneads*, illustrates the correspondence between the architecture of the building and the architectonic, the transcendental idea, of the architect. The architectonic is the ornament or structure of the cosmos, as in the geometrical solids molded by the children of the demiurge in the *Timaeus*. The transcendental idea is the idea which pre-exists perception, the concepts which order the sensible world but do not exist in it, and all the proportional relations derived from them in mathematics and geometry in discursive reason.

The design of the building is the form of the sensible object which corresponds to the idea of the architect. All forms in architecture and art are necessarily ideas pre-existent in the mind of the architect or artist, even if they are arrived at by chance. The architecture of the building exists completely independently of its matter; architecture requires no matter at all, as it is the form of the architectonic. “Therefore go ahead,” Marsuppini says, “subtract its matter if you can (and you can subtract it mentally), but leave the design. Nothing of body, nothing of matter will remain to you.” The form of the art or architecture is identical to the idea in the mind, in the process of the imagination which is the *Vorstellung*, picture-thinking, which is ordered in language, as well as mathematics and geometry. In the *Vorstellung*, pictures are transformed into words as they become mnemonic residues. The mnemonic residue of the imprint becomes the word in language as the spirit of the divine becomes the *logos*, and the order of the syntax of the language, of words or forms, corresponds to the order of the idea.

In the seventh speech, by Tommaso Benci, the *Vorstellungsrepräsentanz*, the representation of the representation in perception, is explained. The medium by which the forms of the ideas are transferred to the imprints of sensible objects is the spirit. In VI.6, images of external bodies “cannot be imprinted directly on the soul because incorporeal substance ... cannot be formed by them through the receiving of images.” Images cannot be immediately or directly perceived; there must be an intermediary which translates the images in perception, as Plotinus held. The soul, though, “easily sees the images of bodies shining in it, as if in a mirror.” The image can only be a reflection or representation of the idea, the image in the soul or intellect. The intellect, through the medium of the spirit, corresponds the form of the idea with the form of the imprint or impression of the sensible body, and this operation is called the imagination. Imagination consists of the formation of images in intellect which are representations of imprints in perception which are representations, determined by intellect, of sensible objects. Such images of the imagination retained in intellect constitute memory, and generate words, from the mnemonic residues, in picture-thinking. The linguistic correspondent of the representation of the image facilitates the memory of it.
This process is generated by the desire or appetite of the intellect, the essence of mind, for the ideas, and it is perpetuated by desire generated by the gaps created between the perceiving subject and on the one hand the inaccessible source of the generation of ideas, and on the other hand the sensible world. The eye of the soul is “aroused to contemplate the universal ideas of things which it contains in itself,” and at the same time “the soul is perceiving a certain man in sensation, and conceiving him in the imagination ....” In both parts of this dual operation, desire is generated and perpetuated. While the soul, or lower intellect, or discursive reason, can preserve an image in memory, in the retention of the mnemonic residues, or imprints, the eye in perception and the medium of spirit, as physical operations, “can receive images of a body only in its presence,” and can only reflect it, like a mirror. Once the image is not present, it is lost. It can only be retained, and transformed in the imagination, through the operations of intellect. The soul, or discursive reason, is dominated by the eye and spirit, and also requires the presence of the image, and thus can only reflect it as a mirror. Intellect, the essence of mind, is required for imagination. The desire for the sensible object outside of visual perception is found in discursive reason as well as sensual experience; the desire for the sensible object as a form of the idea again requires intellect and imagination. The sensual desire is created by the gap between the object as a relation in a syntax, as given by logic, and the object as the form of an idea, as given by intellect, as well as the gap between the perceiving subject in discursive reason and the sensible object.

Tommaso Benci sums up the theses of the Commentary. In VI.8, the form of a body, the shape of a sensible object, is received by the eye, and by penetrating the spirit, corresponds to the figure of the idea of the body which is contained in divine intellect. The correspondence “pleases the soul,” producing the grace of love which is beauty, because it “corresponds to those Reasons which both our intellect and our power of procreation preserve as copies of the thing itself,” the power of procreation being the imagination, the reasons being the linguistic equivalent of the figure in the picture-thinking, the basis of memory. In perception, an imprint of a figure is received by the eye, and it is matched to a figure in the imagination, and transferred to reason in language, and through the intervention of divine intellect, the figure is understood in relation to the architectonic of the cosmos, which results in beauty and love.

In VI.13, all things are understood by the light of the divine intellect, “but the pure light itself and its source we cannot see in this life,” as it is that part of soul or intellect which is inaccessible. Intellect “can turn to this light whenever it wishes,” through “purity of life and intense concentration of desire,” and in so doing, “it shines with the sparks of the Ideas.” Accessing the essence of mind, divine intellect, in reason requires effort, and each individual is free to either make the effort, or to live a life among shadows, being manipulated in thought by sensual forms and sensual desires.

Cristoforo Marsuppini, another student of Ficino, further summarizes the Commentary in the seventh speech. In VII.1, memory in intellect is described
as a mirror which reflects an image of the figure of a sensible object like a ray of light through the eyes, so that another image is formed, as if a piece of wool next to the mirror might be set on fire by the light reflected by the mirror, and the blazing wool would be an image of the sun. The image of the blazing wool in the imagination is a splendor of the first image, “by which the force of desire is kindled and loves,” as perception is a function of desire.

In the summation of Marsuppini, “love, kindled in the appetite of sense, is created by the form of the body seen through the eyes,” as perception is a function of desire, but in perception or imagination the form of the body is without matter. The lack of the matter of the form of the body in vision creates desire, the desire caused by lack, in the disjunction between form and matter. When the figure of the form of the body in the imagination is transformed to or made to correspond to the figure of the form of the archetype in intellect, it is transformed from a particular form to a universal idea in a process of abstraction. Thus “there immediately appears in the intellect another species of this image, which no longer seems to be a likeness of one particular human body, as it was in the fancy, but a common Reason or definition of the whole human race equally.” The particular form becomes an instrument in reason by which a universal abstraction is made, as in the Symposium, by which an idea is formed which orders experience.

As Plato divided beauty into the terrestrial and celestial, venere vulgare and venere celeste, as illustrated in the Birth of Venus of Alessandro Botticelli, so love is divided by Marsuppini into bodily love and intellectual love. A “love inclined toward the senses” resides in “the appetite of sense devoted to the body,” while “another love which is very foreign to commerce with the body” resides in or arises from “intellect’s universal species or Reason.” As sensible objects can only be given as representations in intellect, so the love which resides in the senses can only be given by the love which resides in intellect, and can only be seen as false, without essence, as are objects outside of perception.

**Perspectival construction**

The premise of perspectival construction is that the real world is not immediately perceived, that it is given to us through the intermediary of geometry and mathematics, that vision is a conceptual process. Perspective in painting reproduces the world as geometrically constructed. A scene constructed with perspective appears more real or natural to us precisely because it is not real or natural, because our perception of the world around us does not correspond to the world as it actually exists. This is the thesis of Immanuel Kant, and it is also a basis for the theory of perception of Plotinus. The Enneads of Plotinus were translated into Latin by Marsilio Ficino in the Renaissance. Although there is no reference to Plotinus’ theory of perception in the major treatises on perspectival construction written during the Renaissance—that is,
the *De pictura* of Leon Battista Alberti or the *De prospectiva pingendi*, *On Perspective in Painting*, of Piero della Francesca—Plotinus’ development of Plato’s theory of vision is present in the theoretical basis of Renaissance perspective. References to Plato by Alberti and Piero form the basis of the Neoplatonic element of Renaissance artistic theory. But Ficino did not begin the translation of Plotinus until 1484, fifty years after Alberti’s treatise and ten years after Piero’s treatise.

Perspectival construction, or *costruzione legittima*, was seen as both a model of vision and a geometrical allegory of Neoplatonic emanation, in Leon Battista Alberti’s *De pictura* and Piero della Francesca’s *De prospectiva pingendi*. In the *De prospectiva pingendi*, perspectival construction is a form of *commensuratio* in painting, or proportion, based on the progression from point to line to surface to body. Such a progression serves as a model for the unfolding or *explicatum* of the material world, as can be found in the *Timaeus*, Euclid’s *Elements of Geometry*, and Proclus’ *Commentary on the First Book of Euclid’s Elements*, all available from medieval translations. The geometric progression corresponds to Piero’s pyramid of vision, following the theory of vision of Alberti in *De pictura*, and corresponding to Ficino’s model in the *Theologia Platonica* of 1482.

Of the three parts of painting, Piero declared at the beginning of *De prospectiva pingendi*, only *commensuratio* would be discussed, or perspective, but “mixing in parts of *disegno*, without which it is impossible to demonstrate perspective.” Color would be left out, but the parts of painting would be discussed “that can be demonstrated with angled lines and proportions, that is, the points, lines, surfaces and bodies.” These classifications correspond to the definitions of Euclid’s *Elements of Geometry*. Piero identified five elements that need to be considered in the perspectival construction of a painting: sight, or the eye; the form of the thing seen; the distance from the eye to the thing seen; the lines that connect the eye to the extremities or bordering lines of the thing seen; and the area between the eye and the thing seen. These five elements need to be understood in order to understand perspectival construction.

The eye is defined as that in which are represented all of the things seen under different angles. Objects appear as images in the eye depending on the angle of projection of the lines from the extremities of the objects to the eye; the larger the angle, the closer and larger the object. Objects in space occupy a hierarchy of being, or value, given by the variation in the relation to the angle of projection. This is stated in the Eighth Theorem of Euclid’s *Optica*.

Sensible things, or objects in the sensible world, are therefore abstracted and transformed into images in the eye through geometry. The images in the eye exist as copies of the sensible objects, and the objects become intelligible in the mind’s eye, or objects of the intellect. This is a core idea in the *Enneads* of Plotinus. In the *Enneads* V.5.7:

> actual seeing is double; take the eye as an example, for it has one object of sight which is the form of the object perceived by the sense, and one which is the medium through which the form of its object is perceived, which is also
itself perceptible to the eye; it is different from the form, but is the cause of the form’s being seen ….6

The forms and proportions of sensible things are constructed in the mind, from the idea of the things, or the intelligibles, which are translated to the sensible world through mathematics and geometry, by way of perspectival construction as it plays a role in vision. It is the form of the thing, according to Piero della Francesca, rather than the thing itself, without which the intellect cannot judge nor can the eye comprehend the thing. For Plotinus, in III.6.1, “sense perceptions are not affections but activities and judgments concerned with affections ….” Things in the real world cannot be received immediately through sense perception as themselves, because sense perception itself is a cognitive process. In the twentieth century, David Layzer writes, in *Cosmogenesis: The Growth of Order in the Universe*: “Human visual perception is a cyclical process in which the brain constructs, tests, and modifies perceptual hypotheses. In order to have a percept, we must construct it.”7

Leon Battista Alberti, in his treatise on painting written in 1435, *De pictura*, which has many similarities to Piero’s *De prospectiva pingendi*, constructed a theory of vision in which rays of light are arranged in a pyramid. Surfaces are defined and measured by rays of light which serve to translate visual matter into intelligible matter, giving it the qualities of proportion and arrangement, as for Piero. Certain rays of light, which Alberti called “extrinsic rays,” define the outline, measure and dimension of surfaces. The extrinsic rays define the outline of the pyramid of light in vision. The pyramid is formed between the surface of the matter and the eye, which is the source of an inner light. As Alberti explained: “The base of the pyramid is the surface seen, and the sides are the visual rays we said are called extrinsic. The vertex of the pyramid resides within the eye, where the angles of the quantities in the various triangles meet together” (I.7).8 Extrinsic rays of light measure quantity, which is “the space across the surface between two different points” (I.6), defined by geometry.

Contained within the pyramid of light, and enclosed by the extrinsic rays, are another type of ray, which is called the “median ray.” Median rays, which are weaker than extrinsic rays, are not strong enough to define outlines and measurements, but instead are variable and absorb light and color to varying degrees. They extend between the vertex of the pyramid and the surface of the matter, and fill in the color and shadow found within the outline of the matter. Among the median rays, one in the center of the pyramid stands out among them as the strongest, which is the “centric ray,” which corresponds to the vanishing point of perspectival construction. The centric ray forms a direct line from the vertex of the pyramid to the center of the surface, exactly perpendicular to the surface. The position of the centric ray, along with the distance of the ray from the vertex, determines the disposition of the outline of the surface. The location of the centric ray determines the position of the outline.
Following Alberti, in *De prospectiva pingendi*, Piero described the extrinsic rays in the pyramid of vision as lines which present themselves from the extremities of the thing and end up in the eye, in between which the eye receives and discerns them. Piero described the border of the object which is described by the rays of the eye in proportion and measure. It is the border of the thing, established through measure and proportion by the extrinsic rays from the eye, that determines how things diminish in size in relation to the eye, corresponding to the sharpness of the angle in vision. Thus it is necessary to understand the linear qualities of objects in a picture plane so that they can be represented, in their ideal beauty, as copies of the patterns of intelligible objects.

Following the definition of the elements of the painting, Piero proceeded in the treatise to discuss the elements of *commensuratio*, or perspective, in particular, in the first book: points, lines, and plane surfaces. The point is defined as that which has no parts, something which is imaginative, according to geometers, a thing which is as small as the eye can comprehend, and that which does not contain quantity. This follows the definition of the point in Euclid’s *Elements of Geometry* as that which has no parts. Proclus, in the *Commentary on the First Book of Euclid’s Elements*, held that the point is without parts because it is the closest of all things in matter, or the Unlimited, to the One or the Limit, that which precedes all things in unity and simplicity, as described by Plotinus. The point is without parts in the same way that the soul and the Intellectual Principle, or Nous, the divine intellect, are without parts. Material forms that are more uniform and concentrated, without a plurality of parts, are closer to the origin of matter, closer to the Limit, in the same way that the point in perspectival construction is at the origin of the lines of construction in space, the rays from the eye that determine the boundaries of objects. The point in the eye in Alberti’s cone of vision corresponds to the origin of all things, the One, as it is located among the intelligibles in the mind.

Following the definition of the point in *De prospectiva pingendi*, Piero defined the line as an extension from one point to another. The line plays a particularly important role in vision, the virtue of which is found in the point and the lines which depart from the point to the extremities of an object. The lines departing from the extremities of things and terminating in the eye, or the point, form the angle under which the thing is represented. These characteristics of the line follow the definitions of the line given by Euclid in the *Elements of Geometry*: a line is length without breadth; the limits of a line are points; lines are the limits of a surface; and a figure is that which is contained by boundaries.

In the *Enneads* IV.7.6, Plotinus distinguishes between perception and what might be called apperception, or multiple perceptions. Actual perceptual experience is multiple and diversified; perceived objects have no necessary connections in size or position, and can be perceived in a variety of ways by the different senses. But in human perception all objects and acts of perception
are unified to form a coherent whole which structures the world around us. When the fragmented and variable objects of perception “reach the ruling principle they will become like partless thoughts”; they are organized in a conceptual process. Perception entails the intersection of the immediately perceived image, the percipi or imago in psychoanalytic terms, with a conceptual process, which involves what might be called a priori concepts, in Kantian terms, and concepts which are activated by sensory activity. The possibility of the a priori concept in Plotinus’ model of perception is suggested by Mike Wagner in his dissertation, Concepts and Causes: The Structure of Plotinus’ Universe. According to Kant, in the Critique of Pure Reason, space and time are conceptual structures which do not exist in the real world, or are not given by the senses. The nature and existence of the world around us outside of our ordering of it in the structures of space and time is unknowable to us. We can only know the world as our own geometrically constructed version of it, as our representation of it to ourselves. Perspectival construction, as defined by Alberti and Piero, constitutes the world as we can know it as a representation of it to ourselves in abstract and minimal, universal terms.

Plotinus describes perception as a dialectic of the universal and particular, to put it in Hegelian terms. The perceived object is both whole and divided into parts. In the process of perception, “there will come to be an infinity of perceptions for each observer regarding the sense object, like an infinite number of images of the same thing in our ruling principle.” It is the conceptual process which structures the infinite subdivision of perception, as in the explicatum of Nicolas Cusanus; the unity of perceptual experience is inaccessible, as is the vanishing point of perspective in relation to the lines of emanation, or the unity of the One in the point. Plotinus suggests what Jacques Lacan confirms in the twentieth century; we are inherently fragmented beings in our representation of the world to ourselves in perception as a function of our conceptual processes. We are caught in a perpetual cycle of desire to overcome our own fragmentation, which manifests itself in the concept of the metaphysic. Perspectival construction represents the dialectic of the inescapable fragmented and multiple nature of perception and the metaphysical unity towards which desire leads us; perspectival construction is thus a graph of desire, for our own unattainable unity, and for the real existence of the world around us beyond our representation of it to ourselves.

For Plotinus, perception is a function of this desire, and a mechanism of the conceptual process, and memory in particular. He asks, “does our rememberance of the things we desired accompany our power of desiring ...?” (IV.3.28). The conceptual process is composed of the perceived object, desire, and memory: “On this assumption the desiring power is moved by what it enjoyed when it sees the desired object again, obviously by means of the memory. For why should it not be moved when something else is seen, or seen in a different way?” Thought in Plotinus, as a kind of Hegelian picture-thinking, is composed of mnemic residues of perceived objects, what Plotinus calls “imprints” in “recollections.” In V.3.2:
as for the things which came to it [that is, soul] from Intellect, it observes what one might call their imprints ... and it continues to acquire understanding as if by recognizing the new and recently arrived impressions and fitting them to those which have long been within it: this process is what we should call the “recollections” of the soul.

Our thoughts are propelled by the desire created by the multiple and fragmented images of perception, by the desire to reconnect the mnemic residues of images given by the senses in our minds to the world around us. As Plotinus describes it: “the reasoning power in soul makes its judgment, derived from the mental images present to it which come from sense-perception, but combining and dividing them ....”

The desire is always thwarted because of the barrier put up by our a priori conceptual structuring of the world, so the desire is perpetual and never satiated. The mnemic residue would be defined by Sigmund Freud as the Vorstellungsrepräsentanz, the representation of the representation, as derived from Hegel; and the mnemic residue is at the core of the Plotinian concept of the Intellectual Principle, or Nous, that which is other than discursive reason in mind. Renaissance perspectival construction is generally seen by twentieth-century scholars as being a limited and prohibitive form of representation in art because it does not allow for the uninhibited role of the imago or the mnemic residue, as in dreams, to exist outside of discursive reason. Perspectival construction posits discursive reason as an absolute regulator of perceptual experience, because the metaphysical is only accessible through logic. This is the legacy of the Renaissance.

Plotinus does not deny that what we perceive in the world around us is actually there, as George Berkeley might, but he suggests that things appear to us as they are modified by our perception; ultimately we see the form of the thing, but not the thing itself. A perceived object is only known to us as a mental perception, and a mental perception is only known to us as a memory; the production of the mental perception in memory constitutes cognition as an “image-making power,” as in Hegelian picture-thinking. In Enneads IV.3.29: “nothing will prevent a perception from being a mental image for that which is going to remember it, and the memory and the retention of the object from belonging to the image-making power ....” Through this process, perception as a form of cognition arrives at a conclusion, as the perception of the form of the image is absorbed into a cognitive process, and the fragmented and multiple apperception is transformed into perception, which involves the superimposition of a conceptual structure onto the perceived world, as in perspectival construction: “If then the image of what is absent is already present in this, it is already remembering, even if the presence is only for a short time.” The mnemic image replaces the perceived image which replaces the thing, exactly as in Freud’s Vorstellungsrepräsentanz.

Given that we can only know the world around us as images reproduced in cognition, we can only know the world around us as an absence. Such an
absence is represented in perspective, which precludes any other possibility of knowing the world around us outside of our cognition of it. The absence is present in the vanishing point, as a Negative Theology; in Platonic terms, the essence of the world is unknowable. In Lacanian terms, the absence is the Real, that which is inaccessible to either the Symbolic, the structures of language and perception, or the Imaginary, the immediately perceived imago, which can only be known as it is absorbed into cognition. The Real is that around which desire circulates; we are defined by a continual dialectic of presence and absence, of our representations of the world to ourselves and the unattainable source of those representations.

The vanishing point of perspectival construction in the Renaissance corresponds in architecture to the altar at the end of the nave of the church, to the location of the transubstantiation in the Eucharist, to the point at which the material world, or our representation of it to ourselves, becomes immaterial, and inaccessible. The system of perspective, as developed by Filippo Brunelleschi for the design of the basilica church, entailed this symbolic aspect. In a painting such as Leonardo da Vinci’s Last Supper in the refectory of the Church of Santa Maria della Grazie in Milan, the vanishing point of the perspective corresponds to a void through a painted window in the center which corresponds to the location of the figure of Christ as the material manifestation of the immaterial. The receding lines which construct the illusionistic space from the vanishing point also continue beyond the picture plane to construct the space of the refectory itself. We not only perceive this illusionistic space, but we inhabit it, and we are drawn through it to the point at which it fails to exist outside out own perception and cognition. In Baroque representation, the regular geometry of the emanation of the illusionistic world is replaced by irregular tumult and chaos in relation to the ineffable vanishing point, as in the Assumption of the Virgin in the Cathedral of Parma by Antonio Correggio, for example. In the Baroque it is no longer possible to approach the point at which reason fails through reason itself, because reason itself, or reason in perception, is seen as fragmented and multiple and inadequate, corresponding to the model of Plotinus.

According to Plotinus, in IV.3.30:

The intellectual act is without parts and has not, so to speak, come out into the open, but remains unobserved within, but the verbal expression unfolds its content and brings it out of the intellectual act into the image-making power, and so shows the intellectual act as if in a mirror, and this is how there is apprehension and persistence and memory of it.

Beyond language and perception, the intellectual act is inaccessible to us, except as a reflection in hindsight. Beyond the scaffolding of our thoughts and perceptions, we are inaccessible to ourselves, as in psychoanalysis the unconscious is inaccessible to conscious thought except through the fragments of dream images, according to Freud, or the fragments of linguistic functions, according to Lacan. For Lacan, meaning in language only exists as a reflection
in hindsight after the speech-act has taken place. What lies behind our own thoughts is only accessible to us as fragmented and diversified mnemonic images in picture-thinking, which constitute a reality as ordered by the vanishing lines in perspective. The vanishing point is that point at which we can see behind the mirror, and we can see that there is nothing there.

Notes


2 Piero della Francesca, *De prospectiva pingendi* (Florence: Sansoni Editore, 1942), 63–4: “mescolandoci qualche parte de disegno, perciò che senza non se po dimostrare in opera essa prospectiva ….”

3 Ibid., 64: “che con line angoli et proportioni se po dimostrare, dicendo de puncti, linee, superficie et de corpi.”

4 Ibid.: “La qual parte contiene in sé cinque parti: La prima è il vedere, cioè l’ochio; seconda è la forma de la cosa veduta; la terza è la distantia da l’ochio a la cosa veduta; la quarta è le linee che se partano da l’estremità de la cosa e vanno a l’ochio; la quinta è il termine che è intra l’ochio e la cosa veduta dove si intende ponere le cose.”


Leonardo da Vinci’s theory of vision and creativity: 
*The Uffizi Annunciation*

Liana De Girolami Cheney

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The eyes are the windows of the soul (mind).

Leonardo, *Notebooks*

In his *Notebooks*, Leonardo da Vinci explains how our knowledge has its formation in our perceptions.1 “The eyes, which are called the windows of the soul, are the chief means whereby the understanding may most fully and abundantly appreciate the infinite works of nature.”2 Further, “All true sciences are the result of experiences which have passed through our senses.”

Leonardo invites the observer to first experience nature and then with reason investigate the causes and effects of the experience. This chapter focuses on an aspect of Leonardo’s theory of vision as it is associated with artistic creativity, and in particular, visualized in his *Annunciation* of 1472–78, at the Galleria degli Uffizi in Florence. This is one of the first, if not the first, of Leonardo’s paintings, and it is his earliest demonstration of the integration of theories of vision and perception in visual creativity. Leonardo’s theory of vision is espoused both in his *Notebooks* and *Treatise on Painting*.4

Irma Richter reports how Leonardo begins his discussion on science by employing experience as a starting point, followed by reason and contemplation that deduce external and general laws from temporary experiences. In doing so, “General laws are not only tested in logical sequence like Euclidian mathematical propositions, but also verified through experiments and then applied to the production of works of utility.”5 Leonardo finds that the eye is able to observe natural phenomena, and through these observations the individual deduces laws. He exclaims, “O marvelous, O stupendous necessity, thou with supreme reason compellest all effects to be the direct result of these causes; and by a supreme and irrevocable law every natural action obeys thee by the shortest possible process.”6 Leonardo’s studies of perception include a careful analysis of the anatomical and physiological formation of the eye. From his keen observations and meticulous drawings, he formulated his
theory of vision, which also derives from the ancient (Euclid, Aristotle) and medieval (Ibn al-Haytham) science of optics (appearance) that describes the actions and property of light, and the interactions of light.

Traditionally, the science of optics is associated with geometry and light propagation in the form of rays or a pyramid of light. Through mathematics, Leonardo analyzed the optical qualities of the eye and discovered the optical path of the line of sight as it ends in the sensus communis or favoea (pit). Leonardo’s theory of vision connects the perception of the eye with the science of optics. The geometrical approach to understanding sight assists in explaining how artists perceive light, which in turn permits them to observe nature and then to visualize the study of nature in a painting. For Leonardo, this is how the science of optics or light becomes the science of painting. The artist’s ability to paint nature depends as well on artistic creativity, thus Leonardo’s theory of art is interconnected with his theory of vision.

The ability of human perception to see “divine things,” such as forms, colors, shadows, shapes, motions, and proportions, provides the individual with an infinite number of images—the images of the universe. Leonardo connects the ability or talent of the eye to encapsulate all aspects of nature with the apprehension of beauty in nature, for example: “The eye whereby the beauty of the world is reflected.” His theory of vision, then, is also connected with his theory of art and beauty. For Leonardo, creativity is a process solely understood by a mind devoid of manual operations, where the science of painting is a form of creativity in which the visual elements of light, color, texture, shape, and proportion in a figure or object are apprehended in the mind. “Painting embraces within itself all the forms of nature” because it is the “sole imitator of all the visible works of nature,” Leonardo opined.

In two astonishing drawings from 1489 in the Royal Collection at Windsor Castle—A Study for a Man’s Head in Profile (a silverpoint drawing worked over in ink, on blue prepared paper) and Two Views of the Skull (a drawing in pen and ink over black chalk, Figure 10), Leonardo designed the optic chiasma. In these drawings, he depicted the relative position of the principal functions of the brain—memory, cognition, and imagination—and the seat of knowledge, called the sensus communis (human common sense). This is the place in the brain where all the senses are supposed to come together. The Two Views of the Skull drawing offers Leonardo’s explanation for this concept of common sense: “Where the line a–m is intersected by the line c–b, there will be a confluence of all the senses, and where the line r–n is intersected by the line h–f, there the fulcrum of the cranium is located at one third up from the base line of the head.” In the accurate anatomical and perspectival depictions in these drawings, Leonardo is combining observation and creativity, and thus fusing science and art. Kenneth Keele, a physician and a Leonardo scholar, observes that Leonardo’s neurological theory of visual perception is one of his greatest scientific accomplishments.
This figure has intentionally been removed for copyright reasons. To view this image, please refer to the printed version of this book.
The passion for knowledge or intellectual curiosity is a tool for artistic and scientific quests. Through the process of creativity, artists and scientists investigate nature. The human mental faculty of creativity involves imagination, inspiration, and aesthetic pursuit. Here, in this process, both artist and scientist investigate the truth in nature by observing, experimenting, and demonstrating. In the preface on knowledge, learning, and experience, in his *Treatise on Painting*, Leonardo wrote: “Good men possess a natural desire to know.” He is elaborating on Aristotle’s opening statement in the *Metaphysics*: “All men by nature desire to have knowledge.” The way that the individual wishes to learn, and how learning is acquired, are dictated by the five senses, which are guided by rules of good judgment, which are derived from good experience, in studying the laws of art and nature. For Leonardo, human creativity is connected with the experience of nature. He observed, for example, that: “Nothing can be found in nature that is not part of science.” He employed the study of geometry because it deals with the surfaces of bodies, which originate in lines, which in turn define these surfaces. Leonardo linked the study of geometry or mathematics to the learning of perspective, which is ultimately “devoted to all the functions of the eye.”

In order to explain this function of the eye, Leonardo established a series of principles associated with the science of painting. These principles derive from the principles of geometry. For Leonardo, there are two major principles connected with the shape of the object, and the reflection of light from or on the object. The first principle in the science of painting, in the formation of an object’s shape, is the point, which then creates the line, which in turn forms the surface, culminating in the shape of surfaces to form a body. The second principle in the science of painting is the reflection of light of the object, which Leonardo called “the principle of shadow or chiaroscuro.” He explained how light and shadow model and separate the shape. Throughout his analysis of these principles, he refers to them as outline defining the shape of the surface (the first principle), and shading (the second principle).

Leonardo described how the interwoven connections between these two principles can only be captured by the function of the eye, which realizes and visualizes them in painting. Deriving from Aristotle’s definition of visual properties, he ascribes ten functions to the eye: darkness, light, body and color, shape and location, distance and closeness, motion and rest. These functions are apprehended by the eye and visualized in painting. The science of painting is the “mother of perspective” or the creation of the eye’s visual rays. Leonardo explained that perspective is divided into three components: the outline of the shape, the diminution of colors at distances, and the indistinctness of shape at distances. In explaining his theory of vision, Leonardo claimed that the eye is the most powerful faculty of any of the senses because “it sees by none other than the straight lines, which compose a pyramid, the base of which is the object, and the lines conduct the other to the eye,” as he demonstrated in his
numerous sketches and drawings of the pyramid of vision (Royal Collection at Windsor Castle and Biblioteca Ambrosiana). The eye as the window of the mind is the indicator of the sensus communis of the brain, and it “magnificently contemplates the infinite works of nature.”

Since there is no need for an intermediary to capture the perception of an object, the eye as a visual faculty immediately apprehends nature. The painter is then not only delighted by perceiving nature, but also delights other individuals by creating works of art that reflect nature. For Leonardo, the faculty of the eye is further exalted because it is able to capture the beauty of nature, such as stars, rivers, mountains, birds, and architecture, and “all other excellent things created by God.” Elaborating on the function of the eye as a mirror for spectators, Leonardo reflected on how the psyche or soul of the individual or artist is willing to remain prisoner in the human body for the sake of perceiving the magnificence of nature. He was the first Renaissance artist to elevate the function of the eye to this magnitude. His was able to understand the intromission theory of vision, in which the eye captures reflected light from the object, and the physiological and aesthetic principles guiding the ability of the eye to see nature.

Both in his art and in his writings, Leonardo invites the viewer and the reader to ponder what he calls the “wonders that may be discovered in nature.” He devoted his life to studying nature because, for Leonardo, “art without science is not art at all.” As Martin Kemp observes, Leonardo “had the revolutionary idea that pictures can communicate information more clearly than words.” Leonardo developed a pictorial language for conveying scientifically meaningful information. For him, the study and explanation of natural causes is based on how light “delights the beholder.” For Leonardo, the accurate study of light is only achieved through mathematics, which is a branch of science, because mathematics demonstrates with certainty the process of reasoning. Leonardo explained perception through the beam of light in two different ways: “through the method of natural order and through the mathematical demonstration of their natural order by the deduction of the effects from the causes.” In many ways, Leonardo was a Renaissance man, because he not only shared the humanist view about the significance of the individual, but he also defined this view in relation to nature, art and beauty, in his passionate quest for the art of painting. He proclaimed often in his notebooks what many other Quattrocento artists believed: that the painter strives and competes with nature.

However, this is only a small part of Leonardo’s complex understanding of the relationship between nature and art. Both in his writings and in his art, he demonstrates that nature is the superior guide, the teacher of all good artists. Implicit in Leonardo’s thinking about art and nature is a recognition of nature’s pre-eminence: “For painting is born of nature—or, to speak more correctly, we shall call it the grandchild of nature, for all visible things were brought forth by nature, and those her children have given birth to painting.” Similarly, he establishes nature’s superiority over technology:
Though human ingenuity may take various inventions which, by the help of various machines, answer the same end, it will never devise any invention more beautiful, nor more simple, nor more to the purpose than nature does; because in her inventions nothing is wanting and nothing is superfluous. 

Since painting is the sole imitator of nature, and since it is through the senses that artists may comprehend and understand nature, the eyes are the means to capture this quest. In The Draughtsman Using a Transparent Plane to Draw an Armillary Sphere of 1510 (Biblioteca Ambrosiana in Milan) and Model of The Eye and Diagram of a Visual Path of 1498 (Ms D. Folio 3v), Leonardo expressed his observations on sensory perception, experimenting over and over, as he illustrated in numerous drawings the function of the eye and the path of vision. In the Treatise on Painting, Leonardo wrote:

Don’t you see that the eye embraces the beauty of the whole world? It is the master of astronomy, it practices cosmography, it counsels and corrects all human arts, it transports man to different parts of the world. [The eye] is the prince of mathematics; its sciences are most certain. It has measured the heights and sizes of the stars, it has discovered the elements and their locations .... It has created architecture, perspective and divine painting .... [The eye] is the window of the human body, though which [the soul] contemplates and enjoys the beauty of the world.

The eye, which is called the window of the soul, is the principal means by which the central sense can most completely and abundantly appreciate the infinite works of nature .... If you, historians or poets or mathematicians, had not seen things with your eyes you could not report of them in writing.

For Leonardo, the study of optics is critical to understanding the theory and practice of painting because, for him, optics is the investigation of visual sensations. Thus the artist, in depicting nature, is concerned with painting the ten attributes. These attributes are connected with sight (the eye): darkness and brightness, substance and color, form and space, remoteness and nearness, and movement and rest.

Influenced by treatises on optics of ancient (Galen, Avicenna, and Alhazen) and Renaissance (Leon Battista Alberti, Piero della Francesca, and Luca Pacioli) thinkers, Leonardo based his concept of vision on linear perspective and cast light creating an imaginary cone of space between the eye and the space viewed. He wrote: “Perspective is a rational demonstration by which experience confirms that the images of all things are transmitted to the eye by pyramidal lines,” as seen in the drawing at the Royal Collection at Windsor Castle (Inv. 12604).

The young Leonardo began to visualize his theories of vision and art in the painting of the Annunciation, 1472–78 at the Galleria degli Uffizi (Figure 11). This is the focus of the second part of this chapter. This earlier painting in Leonardo’s artistic career is fundamental, and serves as a fulcrum in the history of art and science in Italian Renaissance art. The painting reveals Leonardo's concept of creativity as part of the science of painting as well as his application of the theories of optics and perception in a painting.
A brief history of the *Annunciation* reveals its many artistic merits. The painting is oil and tempera on wood, an untraditional use of oil, which is usually used on canvas. Its rectangular size measures $96 \times 216$ cm. The shape and size are too large for a predella panel of an altarpiece; although fitting in size for a hope chest or a *spalliera* (head board), the religious subject matter is inappropriate for such domestic furnishings. The monks of San Bartolomeo di Monte Oliveto in Florence commissioned this painting, likely for their sacristy, after the church’s renovation in 1472. Prior to 1869, the painting was attributed to either Domenico Ghirlandaio or Andrea Verrocchio, both established Florentine painters. Subsequently, the painting was considered to be the work of the young Leonardo, which he executed while training in Verrocchio’s workshop. The reattribution is based on a recent restoration and application of radiographic and spectrographic tests, as well as discovered preparatory drawings for the painting. Examples of these studies are *A Lily* of 1473–75, a study in pen, ink, and brown wash (Royal Collection at Windsor Castle); the *Study of a Sleeve* of 1473, a pen and brown ink sketch of the Annunciation Angel’s sleeve (Christ Church Library in Oxford); *The Study of Drapery of a Figure Kneeling* and *Study of Drapery*, both of 1473 and in brush and grey tempera heightened with white on grounded grey linen (Cabinet des Dessins at the Musée du Louvre), and *Studies of Hands* of 1473 (Galleria dei Disegni e Stampe degli Uffizi).

The theme of the *Annunciation* is based on the New Testament. The Angel Gabriel appears to the Virgin Mary in her garden while she is reading. Gabriel kneels in reverence to announce God’s election of her to be the mother of His Son. “The Holy Spirit will come upon you,” Gabriel says to Mary, “and the power of the most high will overshadow you; therefore the child to be born will be called Holy, the Son of God” (Luke 1:26–38 and Pseudoepigrapha Jacob 11). It is customary in the Renaissance that the patron commission the painting as well as choose its subject—here, the Abbot of the Monte Oliveto...
commissioned the painting and provided the subject. The composition of the scene is innovative, differing from the traditional depiction of the Annunciation in an interior setting with a partial view of the landscape, as seen in Fra Filippo Lippi’s *Annunciation* of 1445 (the Doria Pamphili Museum, Rome); in Fra Angelico’s *Annunciation* of 1432 (Museo del Prado, Madrid), and in Domenico Ghirlandaio’s (attributed) *Annunciation* of the 1470s (Collegiata di San Gimignano),

Leonardo depicted the miraculous scene in an open courtyard, which is an extension of a bedroom of a Renaissance palace. An extensive panoramic view of a Tuscan landscape and seascape is shown in the background of the painting, while a massive parapet in the middle ground separates the panoramic view from the internal courtyard in the foreground. In his analysis of the science of painting, Leonardo included a special section on “How to Portray Landscapes.” He explained for the artist how “the landscape should be portrayed in such a manner that the trees are half illuminated and half shaded, but it is better to make them when the sun is covered by clouds.”

Leonardo also explained how the artist should consider the quality of the atmosphere, the position of the sun, and the type of clouds in the sky. These elements effect the color selection and how light and shade reflect on depicted objects. His discussion of aerial perspective or atmospheric perspective is associated with the perception of colors: “when great quantities of air are found between your eye and the mountains, the color in the distance appears blue or almost blue.” Leonardo elaborates:

> the mountain distant from the eye will show itself as the most beautiful blue that is in itself the darkest and that will be darkest that is highest and most wooded because such woods show their trees from the undersides since they are mighty high and the undersides are dark because they are not exposed to the sky.

In the background of the painting is Leonardo’s atmospheric perspective or the *sfumato* (smoky) technique, which is intended to capture the diffusion of air changes. This illusionism is achieved by using color tones from light to dark so the eye does not perceive boundaries or lines, but a continuous flow or mist. The continuous background depicts various types of cypress trees, framing different aspects of a Tuscan harbor (Pisa) filled with sailboats and ships. The placement in intervals of the trees and their vertical forms also provide a framed view of mountains and villages. He also achieves a chiaroscuro effect (light and shade) in the depiction of the two figures, the Angel and the Virgin Mary, employing a modeling technique with the softening of the contours of the form. Leonardo, in *On Painting*, had this to say: “O painter! That you cannot be a good one if you are not the universal master of representing by your art every kind of form produced by nature … seas and planes, trees, animals, plants, and flowers—which are surrounded by shade and light.”

Employing the Renaissance laws of linear perspective, Leonardo invites the viewer to observe a rationally constructed space in the painting. In the *Science*
of Art, Martin Kemp analyzes the perspective of Leonardo's *Annunciation*, demonstrating vanishing points and the convergence of diagonal lines drawn from the floor tiles.\(^47\) The shape of this perspectival analysis is pyramidal. As Leonardo noted, the "eye sees in no other way than by a pyramid."\(^48\) In the *Annunciation*, Leonardo realizes his early conceptions of optics, perspective, and color theories. In his study of nature, he fuses together an objective observation, a subjective expression, and a mathematical approach to vision. The mathematical approach to vision depends on the Florentine artistic heritage of a rational understanding of light, a geometrically correct perspectival projection of space, and an organically constructed system of proportion.

Leonardo deviated from the traditional depiction of an Annunciation. By employing his artistic creativity, he fused a visual experience with a magical event. In analyzing the composition, three dominant formats are constructed in the shape of two rectangles and a square. One of the rectangles is horizontally composed with the background of trees, landscape, and seascape. The parapet separates this first rectangle from the second one, also horizontally composed, depicted in the foreground. This second rectangle contains a *hortus conclusus* (enclosed garden) with the angel and an elegant lectern. The square format is present in the foreground as well. The space of the square contains an exterior wall of a Renaissance palace with an open doorway, where a bedroom is seen, as is a seated Virgin Mary reading in the vestibule. The quoins, corner wall decoration of rectangles and squares, reinforce the geometric composition of the entire scene. Jane Aiken suggests that Leonardo applied the golden section in some of his compositions, such as *The Vitruvian Man*.\(^49\) It is perhaps in the *Annunciation* that Leonardo experimented with this concept for the first time.

The formation of these geometric shapes is not accidental. Complex symbolism is connected with their design. In the two rectangular spaces, background and foreground, Leonardo reveals two types of realms in nature. The natural realm is created with the connection of atmospheric perspective, capturing the coloration of a spring season. The divine realm is formed in the depiction of the *hortus conclusus*, also in a rectangular shape, containing a carpet of spring flowers. These flowers are associated with the religious moment: lily whites, white champions, flax, daisies, morning glories, lavender, and claimants symbolize the Virgin Mary's innocence and purity. Passion flowers, irises, and forget-me-nots allude to Mary's love and mourning. Ingeniously, Leonardo uses the lectern as a fulcrum to connect the divine realm with the Virgin Mary's natural realm. The shape of the rectangle is connected with the shape of the square, creating a Tau cross.

The lectern is a combination of a Renaissance baby cradle and a sarcophagus, an allusion to Christ's birth and death, as seen in Raphael's *Holy Family* of 1518 at the Louvre, and Lotto's *Holy Family* of the 1530s at the Boston Museum of Fine Arts.\(^50\) The decoration on the lectern is filled with classical details, acanthus leaves, garlands, scallop shells, and lions' paws, recalling Verrocchio's design of Piero and Giovanni de' Medici's sarcophagus of 1472 (in the Old Sacristy
in the Church of San Lorenzino in Florence). However, Leonardo adds another level of meaning in his placement and depiction of the lectern’s decoration. The lectern is placed in a living meadow. Its decoration is made of marble and mortuary symbols, predicting Christ’s death, while the natural flowers in the *hortus conclusus* allude to the present moment and to life, as in the annual rebirth of spring or the eventual rebirth of Christ or His Resurrection. The pedestal that supports the lectern is in the shape of a chalice, alluding to the Eucharistic body of Christ, thus reinforcing the theme of life, death, and rebirth. Another symbolic role that can be seen in the portrayal of the pedestal is its association with the baptismal font and the purification of birth and life.51

Leonardo’s studies of nature extend to the formation of clouds in relation to the atmosphere and how the wind pushes the clouds to move through the sky. Always using the eye as the witness of natural phenomena, Leonardo commented how clouds, which are closed to the eye, will seem “swifter than that which is higher.”52 In the *Annunciation*, Leonardo depicted various types of clouds moving from the background to the foreground, capturing the aerial perspective as well as movement of the wind. He examined the changes in the wind in relation to the movement of clouds as well as to the flight of birds, as “the movement of things that fly [birds] is much swifter than that of the wind.”53 His study of birds in flight was extensive, combining physiological studies with the mechanical formations of movement in flight. The study of the atmosphere in Leonardo’s painting, in particular the cloud with the study of the bird in flight, provides an appropriate amalgamation with the study of movement. However, in the background of the landscape it is not accidental that Leonardo depicted the clouds moving from the “mountain of God” toward the foreground where Mary is receiving the announcement of her holy role by the Angel Gabriel, the Messenger of God. In the foreground, one cloud in particular is seen floating above Gabriel’s wings and moving toward Mary. As the cloud approaches, the miracle of conception is taking place in the *hortus conclusus*.

Leonardo deviated from the traditional depiction of the Holy Spirit, in which a dove and the presence of God’s hands are used in Annunciation scenes, as in Lippi’s *Annunciation*. Cleverly, but discretely, Leonardo employed the formation of a cloud to compose a dove as symbol of the Holy Spirit. Here, Leonardo used a natural atmospheric formation to symbolize a divine form—an observation that is now being reported for the first time.

Leonardo also designed an imaginary line moving diagonally, a compositional line from the cloud-shaped dove to Gabriel’s blessing gesture. He extended the line horizontally to reach Mary’s greeting with her opened left hand. Her gesture of acceptance evokes Christ’s stigmata as well. Compositionally, the dove flies from the sky in the background of the painting to connect with the Angel in the *hortus conclusus* of the foreground of the painting. But symbolically, the appearance of the dove transforms a natural realm into a divine realm. Leonardo repeats this concept of life and rebirth
in the background landscape, located next to the parapet of Mary, where two cypress trees, which are symbols of mourning, frame a panoramic *veduta*. This view focuses on the “mountain of God” as well as the sea harbor, an allusion to the Sea of Galilee, and Mary as the Star of the Sea.

For Leonardo, the *Annunciation* as a painting is an instrument for discovering nature, where the application of perspective, color and light reveal a process of visual reasoning, a science of painting, where images of the natural world are not only perceived by the eye, but also delight the soul. “Painting presents the works of nature to our understanding with more truth and accuracy than do words or letters,” as Leonardo said. He went on to say:

> Painting comprehends in itself all the forms of nature .... Take a poet who describes the beauty of a lady to her lover and a painter who represents her and you will see to which nature guides the enamored critic. Certainly the proof should be allowed to rest on the verdict of experience.

### Notes

1. See Edward MacCurdy, ed., *The Notebooks of Leonardo da Vinci* (New York: George Braziller, 1939), 67. Furthermore, Leonardo composed a treatise on painting during his lifetime, parts of which are incorporated into a series of codices. The oldest manuscript that is considered to be a treatise on painting is the Codex Urbinas 1270 at the Vatican Library. See also A. Richard Turner, *Inventing Leonardo* (London: Papermac, 1995), 56–68.

2. See Leonardo’s Note in Bibliothèque Nationale, Paris, B.N. 2038, 19r.

3. See Leonardo’s Note in *Trattato della Pittura*, at the Vatican Library (Codex Urbinas 1270), 33r.


6. Ibid., 110.


9. Ibid.

10. Ibid., 23–30.


13. Ibid., 39.


Ibid., 16, n. 18.


Ibid., 20.

Ibid., 21.


See Aiken, “Leonardo’s Mathematical Proportions.”

See Kemp, *Leonardo On Painting*, 28, for a disputation between a painter and a poet. See Leonardo’s comment: “And if you, O poet, tell a story with your pen, the painter with his brush can tell it more easily, with simpler completeness and less tedious to be understood. And if you call painting dumb poetry, the painter may call poetry blind painting. Now which is the worse defect to be blind or dumb? Though the poet is as free as the painter in the invention of his fictions, they are not so satisfactory to men as paintings; for, though poetry is able to describe forms, actions, and places in words, the painter deals with the actual similitude of the forms, in order to represent them. Now tell me which is the nearer to the actual man: the name of man or the image of man? The name of man differs in different countries, but his form is never changed but by death.”


See Kemp, *Science and Art*, 204.

See ibid., 170.


See Alessandro Vezzosi, *Leonardo da Vinci* (New York: H. N. Abrams, 1997), 46 and figure. Leonardo’s early drawings reveal his interest in perspective, as reflected in his sepia drawings and perspectographs as well as in his numerous studies on the perception of the eye and light reflections and refractions. These studies are recorded in: (a) Manuscript F, where he explains his theories on optics and shadows; (b) Manuscript D, where he demonstrates how the eye has the power of vision, and (c) Codex Leicester, which contains notes on light reflections.


38 The church of San Bartolomeo di Monte Oliveto is part of a monastic complex located in Via Monte Oliveto in Florence. In 1334, a monk from the order of Monte Oliveto Maggiore built the convent. In 1377, the convent was restored and the land was expanded with a donation from Bartolomeo Capponi. In 1454, a new building was erected based on Michelozzo’s design.


42 See Kemp, *Leonardo On Painting*, 162, fig. 163.

43 Ibid., 162.

44 Ibid., 80.

45 Ibid., 83.


49 See Aiken, “Leonardo’s Mathematical Proportions.”

50 See J. C. Cooper, *An Illustrated Encyclopaedia of Traditional Symbols* (London: Thames and Hudson, 1978), 44, for an explanation of the symbolism of the cradle: “A cosmic barque, which gives shelter in life and at death.”


53 See ibid., 486.

54 See Antonio Natali, “Dubbi, difficoltà e disguidi nell’Annunciazione di Leonardo,” in Natali, ed., *L’Annunciazione di Leonardo*, 49. This essay contains a stimulating explanation of the symbolism of the mountain and sea in the background of the painting, both connecting with the atmospheric and linear perspective.


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At the boundaries of sight: The Italian Renaissance cloud putto

Christian Kleinbub

Perhaps cloud putti were meant to be overlooked. Composed of the very clouds that support and surround sacred personages in Italian Renaissance paintings, the cloud putto may serve its purpose best when it goes practically unseen (Figure 12). Compared to its clothed and embodied angelic cousins, the cloud putto is a nascent being, an angel before its assumption of full fleshly form. Invisible to all but attentive viewers, cloud putti are the most elusive figures in the religious images of the time, so much so, that even the word “figure” here may be misleading. Many cloud putti appear in states before the last stages of their reification, as emergent faces, heads, or upper torsos, mere extensions of larger cloud masses that fall well short of the normative bodies discussed in Renaissance theories of history painting. They have also been largely neglected by scholars, for while recent scholarship has explored aspects of the rich conceptual history of spirits assuming aerial bodies, especially as regards the demonic, many aspects of the history and significance of cloud spirits, especially in relation to the tradition of representing angels, remain to be considered. In tracing aspects of the history of the cloud putto, this article seeks to redress this omission. It asks important questions about the cloud putto’s theological meaning, and marks its significance within the context of the period’s artistic practices. In doing so, it shows that cloud putti, far from being supporting characters or unimportant beings, help, as inhabitants of the boundaries of the visible world, to establish the representational status of numerous important images. As we shall see, the cloud putto can tell us much about how the artist might accommodate the supernatural within the norms of naturalistic painting.

Of course, the cloud putto was hardly the earliest manifestation of the putto in Renaissance art. Long before its introduction, putti were shown as human infants with flesh-colored bodies and feathered wings. Derived from classical genii, these Renaissance putti, called spiritelli, represented nature spirits or angelic beings associated with the air and operating through pneumatic substances.
In keeping with their ancient models, many Renaissance putti cultivated playful demeanors appropriate to their youthful forms, throwing flowers, making music, dancing, and hoisting garlands. Others appear in attitudes of deep veneration, paying homage, as the multitudinous inhabitants of heaven, to God, the saints, or the Virgin. In those cases where they represent angels, the putto’s job was one of ministration, aiding in the revelation of the godhead to men.

There was, however, a problem in adapting the classical putto to Christian ends. While in antiquity the invisible or spiritual nature of putti was not generally emphasized, the Renaissance putto could be an angel who was by definition bodiless, lacking physical, fleshly form. When angelic putti appeared to humans, they had to do so by means of a physical illusion, for otherwise they would be invisible to the corporeal eyes of men. The problem for artists was further compounded, however, by the fact that classical putti, known primarily from ancient statuary, were first introduced to Renaissance art in bronze and marble. Although a sculptor might attempt to “dematerialize” the putto using low relief and schiacciato, the true nature of angelic putti could be more effectively conjured through pictorial means.

It appears that it was a theological impulse that caused Quattrocento painters, after having adopted the angelic putto, to develop a number of related conventions. Representing angelic immateriality as transparency, some artists chose to designate putti by their mere outlines drawn against the light of a glory, as in the case of Luca Signorelli’s putti in the cupola of the Sacristy of San Giovanni at the Basilica of the Santa Casa at Loreto (c. 1478). A related approach was to depict putti monochromatically in a single modulated color such as gold, red, or blue, which associated the putto with supernatural attributes like aureoles. Notable examples of monochromatic putti can be found in Andrea Mantegna’s Friedsam Madonna (c. 1460), where gold and red putti crowd around the Virgin and Child in the form of an angelic mandorla.

While the “transparent” and “monochromatic” putti of the Quattrocento can be understood as responses to a basic theological dilemma, they did not, in fact, answer to it entirely. While, for some artists and viewers, the fleshly putto did not adequately signal the immateriality of angelic beings, the solutions for representing that immateriality could not avoid the charge that they still offered embodiment by different means. Transparent and monochromatic putti pointed to the spiritual nature of angels, but they could not explain away their vestigial visibility. These kinds of putti were, in essence, iconographic compromises, for ultimately the outlines of even “transparent” putti are visible to the bodily eyes.

The twin problems of immateriality and visibility thus led in two different directions. One viewer might prefer the fleshly putto because it acknowledged that angels assume physical bodies or on account of its classical pedigree; another might prefer putti that acknowledge their essential immateriality. The choice was between two modern ideals, the former favoring a sense of antiquity through emulation of fully sensible forms, the latter inclining towards
the aggressive adaptation of classical ideas to wholly contemporary religious purposes. Both positions are of more than local interest, for they allow us to say something important about the critical imperatives of representation in the period. They represent attitudes about what painting should do as a medium. In effect, they ask whether the medium should represent those things visible to the eye, or the very essence of sacred things through a mixture of recognizable forms and symbolic conventions.

Artists themselves were inconsistent. A painter like Mantegna might show putti in one painting as fully embodied and winged children, while in another work emphasize their immateriality. But Renaissance people probably realized that both these gestures were basically inadequate. This inadequacy must have been deeply felt, too, for artists sought other ways to reconcile representational imperatives with the immateriality of the angelic putto in the years to come.

One important solution to the issue of representing putti derived, naturally enough, from theology, where angelic visibility was a long-standing problem. Augustine was among the first to ask how the invisible angels made themselves visible to men. He thereby helped to establish the grounds for thinking about what might be called the “physical visionary,” the study of how visible manifestations of the divine are effected by God according to physical laws. It was only later, however, during the Middle Ages, that Augustine's questions became urgent. Scholastic theologians in particular investigated the physical visionary as a matter of the foremost importance, subjecting it to sustained and systematic investigation.

A large portion of this debate was sparked by Peter Lombard's exceedingly influential Sentences. Claiming Augustine as his authority, the Lombard asserted that angels have their own bodies, and that these bodies might therefore be seen by grace under particular circumstances. This view, however, was controversial. In his Commentary on the Sentences, Thomas Aquinas disagreed, saying that Augustine's position had been misunderstood. For Aquinas, spiritual creatures like angels were necessarily bodiless entities.

Aquinas did assert, however, that the angels could assume material bodies as need required. The question, then, was how. True to the Scholastic aim of reconciling Aristotelian science with Christian theology, Aquinas crafted scientific explanations for miracles and visions that elucidated the ways in which supernatural events occur in accordance with physical laws. As Michael Cole has shown, theologians generally considered air the preferred medium of apparitions, and Aquinas thought the same, writing that “the air is, among the elements, the one which most enables transmutation, and is convertible into any thing.” Aquinas makes a proof of his point by citing the experiences of those who had tried to cut demons apart with their swords. When sliced in two, the demons, who were subject to the same apparitional mechanisms as angels, instantly fused back together again, as if formed of air.

If one inquires further about how these apparitions come about, one finds that the mechanics of Aquinas' physical visionary depends on the model of
the condensation of clouds. At the moment of apparition, the air thickens to form a body mimicking the characteristic properties of earth-bound matter.\textsuperscript{20} In the *Summa Theologica*, Aquinas describes the process thus:

> Although air as long as it is in a state of rarefaction has neither shape nor color, yet when condensed it can both be shaped and colored as appears in the clouds. Even so the angels assume bodies of air, condensing it by Divine power in so far as is needful for forming the assumed body.\textsuperscript{21}

In this way, the visionary could be presented to the corporeal eye as a material manifestation in a cloud-composed image, a miraculously wrought impersonation of a divine person or thing. It was itself a representation.

With the cloud putto, Renaissance artists, like Scholastic theologians, took up Aquinas’ theory of the physical visionary in order to reconcile abstract theological truth with the natural world in their work. In considering the cloud putto, then, we recognize how similar definitions of perception, especially as regards physical vision, established imperatives within painting about what could be represented within the boundaries of the period’s naturalism. It might be said that the considerations of theology helped enforce and extend aspects of Renaissance representation, pressing artists to conceive of new forms to mediate the divine in physical terms, while discouraging other kinds. The cloud putto may thus be read as a specific acknowledgment of an important, if partially circumscribed, consanguinity of theological and painterly practices and doctrines.

Cloud itself was a significant site for experimentation about the boundaries of representation. As Hubert Damisch has pointed out, cloud, through its nebulous nature and its resistance to the lines that define shapes, could facilitate the introduction of supernatural, imaginary, and otherwise irrational things within the rational regimentation of space established by linear perspective in Renaissance painting.\textsuperscript{22} Like a bridge between heaven and earth, cloud shows not only how firm physical laws might be abridged, but also how “profane space may open onto another space, which imbues the former with its truth.”\textsuperscript{23} To extend Damisch’s theory of cloud in Renaissance painting, we might thus say that the cloud putto epitomized, even embodied, the idea of mediation between earthly and heavenly space, spaces seen and unseen, within its form-shifting contours. Compared to most clouds, cloud putti more fully dramatized the liminality inherent in their nebulous medium.

But cloud putti could also conjure the idea of dynamic, creative forces at work. Indeed, they evoked parallels with the human artistry through the very matter of their presentation—parallels that would have been resonant for period artists and viewers alike. Gazing upon a cloud putto, certain Renaissance viewers would recall the important classical tradition of pictorial fantasies spurred by the forms of clouds in nature.\textsuperscript{24} Classical authors including Lucretius, Pliny, and Philostratus had written about how clouds and other irregular substances exercised the imagination, evoking novel pictures before the mind’s eye.\textsuperscript{25} In the Renaissance, these ideas were
taken up by Leonardo da Vinci, who promoted the idea that irregular bodies and surfaces like clouds and stained walls might stir the artist’s imagination through their approximate, if suggestive, promptings. If Giorgio Vasari is to be believed, Piero di Cosimo took Leonardo’s advice, staring at clouds and discolored walls in order to imagine novel things.

As a tool of the imagination, cloud forms therefore held a special place, indicating that boundary zone between the formed and unformed, where fantasy could enter reality through the suggestion of a cloud’s billowing contour or its lightened fringe. Such cloud pictures might even indicate the imagination of the artist, his fantasia, at work in the painting. This is how one might read the famous picture cloud showing a horse and rider in the upper left corner of Mantegna’s Vienna St. Sebastian (c. 1457–58). Whatever its specific iconographic import, this cloud presumably refers back to the ancient tradition of cloud pictures, presenting the viewer with evidence of the artist’s high invenzione. Given the seemingly elusive nature of the cloud-horseman’s significance, one scholar has gone further still, proposing that Mantegna only found the image of the horseman as he painted the cloud in the sky, and imagined the picture into it, thus reliving the classical trope of invention in the actual execution of the painting. In the case of the cloud putto, this example may suggest how mortal ingenuity could imitate, and even join with, the divine kind. Not only that, it may implicate angels in the painter’s own creation. The early modern artistic imagination was sometimes subject to angelic, not to mention demonic, influences. In fact, it has been pointed out that the spirits, the very spiritelli who were thought to affect the humors and stir the emotions, might have been thought to fire artistic imaginations, thus enabling painters’ depictions of them.

Of course, the cloud putto’s effectiveness—its ability to implicate both the angels and the artist in representations of the visionary—was entirely dependent on painters’ growing ability to reproduce the natural qualities of clouds in their work. More perhaps than even theological concerns, it was the compelling naturalism of clouds in painting that gave the cloud putto an edge over earlier, more artificial-looking devices for rendering the putto’s angelic immateriality. Cloud putti, unlike the transparent or monochromatic kind, looked like they belonged to the viewer’s own world. Instead of standing apart from mankind in religious scenes, they seemed to grow out of their natural environs. The cloud putto appears in a painting like a cloud in the sky or the aftereffect of a storm: a meteorological event woven within the texture of the physical world.

No wonder, then, that it was only toward the end of the Quattrocento, when artists were increasingly able to represent convincing landscapes and skyscapes in their works, that the cloud putto became popular in painting. And no doubt the rise of oil painting, in particular, enhanced artists’ abilities to render cloud putti, as it allowed for subtle, coloristic effects, not to mention the softening of contours with variegated shadows that were essential to the evocation of nebulous phenomena.
Naturally, one of the first artists to unite these trends was the Venetian painter Giovanni Bellini. A master of light and atmosphere, Bellini had already achieved new levels of naturalism in his depiction of the sky in early works in tempera, such as the *Agony in the Garden* (c. 1464–65), and by the time he began to experiment with oil paints in the early 1470s, his attention turned to the cloud putto. One of his very first paintings in oils, the Pesaro *Coronation of the Virgin* (c. 1473–76, Figure 13) shows a number of discrete cloud putti gathered near the aureole of the Holy Spirit at the apex of the altarpiece, where they range among examples of the monochromatic kind. These cloud putti are unlike many later examples. Discrete, partly transparent tufts of vaporous matter in the form of putti heads, these diminutive creatures drag short trails behind them as they sweep into position among the other angels. They glow pink in the light of the aureole, as if they were clouds caught by the rays of the rising sun: their color anticipates how their bodies shall shortly assume more fleshy tones. They are also fragile and insubstantial, some remaining unformed, ready at any moment to disperse back into the atmosphere above the Virgin’s throne. Given their variety, these putti do not seem to belong to any established tradition of imagery, but rather appear like the products of a creative artist’s imagination prompted by theology. Uncertain of how best to show cloud putti coming into being, Bellini’s examples constitute experiments, free improvisations, variations on the theme of nebulous form.

It is perhaps due to their experimental nature that Bellini’s cloud putti enjoyed relatively little success with other artists during or after his lifetime.
An exception was Giorgione, who portrayed cloud putti floating at the entrance of the manger-cave in the *Adoration of the Shepherds* in Washington (c. 1500).\(^3\) Giorgione’s cloud putti, like Bellini’s, are diminutive, semi-transparent heads with ghost-like wings that, glowing with a pinkish light, are at the very beginning of their transformation into visible beings. As such, they almost seem to disappear, allowing the artist to acknowledge the presence of the supernatural without compromising nature’s dominant position in the painting. Unlike the messenger angel in white robes who speaks to the shepherds in the background, these cloud putti work as representatives of the unseen presence of God, the nearly invisible representatives of the numenal world inside the physical one.

Other Venetian artists, including Giorgione’s pupil Titian, took up the cloud putto, but rendered it in a different fashion. One looks in vain for the small, discrete cloud putti of Bellini or Giorgione in Titian. Rather, Titian gives us cloud putti of a more dramatic kind, integrated with the larger masses of glowing glory clouds, where their bodies seem to swell from the cloud’s surface with the growing light coming from behind them. Such cloud putti first appear in the artist’s *Assunta* (c. 1516–18), where they emerge from the cloud to encircle the Virgin and God the Father in heaven. On the left of the glory, some of their cloudy heads are juxtaposed with the fleshly ones of the fully formed putti below, making clear the process by which these angels assume their human guises. But at the same time that Titian’s extraordinary cloud putti represent a more developed idea of the cloud putto, they also raise the question of origins. Were these cloud putti Titian’s invention, the fruit of some artistic convergent evolution, or a superb instance of a device stemming from another, unexplored tradition?

If one seeks a source for Titian’s imagery, one might consider the paintings of Andrea Mantegna. As we have seen, Mantegna was an artist especially interested in rendering cloud pictures in his paintings: it would seem that a cloud’s nebulous mass offered a special representational challenge to this artist of crisp, delineated forms. But Mantegna was not an early innovator of the cloud putto, sticking to fleshly and monochromatic putti until late in his career. Only at the end of the Quattrocento, when he painted his *Trivulzio Altarpiece* (c. 1494–97), did Mantegna depict cloud putti appearing in the clouds that surround the Virgin and Child in the midst of their golden glory.\(^3\) It must be said, however, that these cloud putti were different from Bellini’s or Giorgione’s. Instead of discrete wispy beings, Mantegna offered cloud putti integrated within larger cloud bodies, emerging from their grayish substance rather than appearing outright and independent of them. Could they have inspired Titian?

At first, the scenario appears likely: Titian, who probably knew something of Mantegna’s *Trivulzio Altarpiece* in Verona, developed Mantegna’s integrated cloud putti in his own work. But, as I will now show, Mantegna and Titian were both the beneficiaries of a tradition born in central Italy, a tradition of the cloud putto that has been largely forgotten.
About a decade before Mantegna used them in his *Trivulzio Altarpiece*, integrated cloud putti appear on the frescoed vaults of the Carafa Chapel in the Dominican church of Santa Maria sopra Minerva in Rome. The vaults and walls of this chapel were painted by the Florentine painter Filippino Lippi between 1488 and 1493. The chapel’s patron, Cardinal Oliviero Carafa, protector of the Dominican order and a man well versed in the order’s doctrine, dedicated the chapel, significantly, to St. Thomas Aquinas and the Virgin. In light of these factors, it is not surprising to learn that Filippino assiduously sought to replicate the finer points of Thomist theology in his decorations, probably using the theological advice of his patron and other Dominicans. What has not been pointed out is that Filippino also presumably learned about Aquinas’ theory of the physical visionary and brought it to bear in painting the chapel ceiling. There we see the figures of four sibyls, each appearing with full-sized angels and scrolls displaying their prophecies while seated on flattened cloudbanks (Figure 14). It is from the grayish-white bodies of these cloudbanks that Filippino’s cloud putti so actively emerge. As one might expect, some of these putti have largely assumed the shapes of human infants, while others are merely suggested by modulations of contour and shadow on the cloud’s surfaces. Filippino appears to have painted the cloudbanks rapidly on wet plaster with loose, streaking brushstrokes that give the clouds a kind of kinetic dynamism. The cloudbanks stir like a rich grayish soup, as appropriate to the site of these angelic transformations.

Filippino painted cloud putti in other places as well as Rome. One year before he began work at the Carafa Chapel, Filippino was commissioned to paint the Strozzi Chapel in another Dominican church, Santa Maria Novella,
in Florence. Although technically begun before the Carafa, the Strozzi Chapel frescoes took him many years to complete, and were only finished around 1502. Because we have no documentary proof of the order in which the frescoes were painted, we cannot do more than speculate about whether the vaults of the Carafa or the Strozzi Chapels were completed first, although the early completion of the Roman commission suggests that it received the artist’s fullest attention in the later 1480s and early 1490s. In any case, Filippino painted ceiling vaults for the Strozzi Chapel with figures of prophets on cloudbanks studded with the emergent heads of cloud putti, thus demonstrating the novel idea of the cloud putto in Florence itself.

From Filippino, the idea of the integrated cloud putto spread, with artists absorbing his work beyond Rome and Florence. Indeed, the integrated cloud putti of Mantegna probably have their origins in the Mantuan artist’s experience of Filippino’s vaults in the Carafa Chapel. After all, Mantegna was also in Rome right at the same time as Filippino between 1488–90, having been commissioned to paint the chapel of Pope Innocent VIII, now destroyed, in the Belvedere Villa at the Vatican. Mantegna himself does not seem to have debuted the cloud putto at this time. According to eighteenth-century descriptions of the chapel, Mantegna’s decorations celebrated the life of St. John the Baptist alongside scenes from the stories of Christ, the Virgin, and the Old Testament. Although putti are mentioned in these texts, they are described as holding festoons, garlands, and inscriptions, and thus they probably resembled the fleshly putti bearing garlands in the Camera Picta in the Castello di San Giorgio in Mantua rather than the cloud putti of the Trivulzio Altarpiece.

If Mantegna learned of the cloud putto from Filippino Lippi, we might ask why not Titian from Mantegna? After all, before the Assunta, Titian had not traveled to Florence or Rome; as we have seen, he had probably visited Verona. And, yet, if we consider the way in which Titian’s cloud putti are combined with a golden glory cloud, we realize that there is another way for him to have discovered the cloud putto: from the Florentine artist Fra Bartolommeo.

Fra Bartolommeo, the Dominican painter and follower of Savonarola, was specially equipped, theologically speaking, to understand and use the cloud putto. As part of his religious training, he presumably learned from the works of Thomas Aquinas and other Dominican theologians, imbibing the physical visionary in his readings from them. In 1508, Bartolommeo went to Venice where he received his commission from the Dominican church of San Pietro Martire on Murano for his God the Father with Saints Mary Magdalene and Catherine of Siena. That painting, which shows God the Father enthroned in a glowing glory, incorporates a semi-circle of cloud putti heads around the neck of the divinity. Although these cloud putti do not grab the viewer’s attention, they actually constitute an important innovation, for Bartolommeo here combines—probably for the first time in Western painting—the integrated cloud putto with the glowing glory cloud. In earlier works like Mantegna’s
Trivulzio Altarpiece, clouds, cloud putti, and glory remained strictly separate: the artist attempted no integration of them. And whereas Bartolommeo probably learned something from Bellini’s handling of light shining through cloud, this Venetian’s influence cannot account for the totality of this invention. Indeed, it would seem that Bartolommeo had likely combined his knowledge of Filippino’s integrated cloud putti on the vaults of the Strozzi Chapel in Florence with what he had learned of Bellini’s glowing clouds in Venice. The resulting imagery would be popular for centuries to come.

Bartolommeo’s altarpiece was influential in Venice, even though it did not come to reside there. Having returned from Venice, the friar had finished the altarpiece in Florence, while agents traveled back and forth between the two cities bearing news and, we assume, drawings documenting the painting’s progress. Titian, like other artists, probably benefited from these interchanges, but even if he did not, he might have learned about the cloud putto directly from Bartolommeo himself when they met in Ferrara in 1516. The meeting of Bartolommeo and Titian has long been viewed as one of the crucial artistic encounters of the period, credited for bringing Bartolommeo’s dynamic compositional ideas for an Assumption to Titian’s attention before he painted his Assunta a few years afterwards. If Titian took away so many of Bartolommeo’s compositional ideas from Ferrara, it is only natural to assume that he also absorbed the Florentine’s approach to the cloud putto and the glory cloud.

Bartolommeo’s promotion of the cloud putto may not have been confined to Venice, for it is possible that he also played a role in Raphael’s adoption of the cloud putto as well. According to Vasari, Bartolommeo was a friend of Raphael, and the two swapped artistic knowledge, the former instructing the latter in the handling of color in return for lessons in perspective. In the present context, it is worth noting that Raphael’s cloud putti only appear after his departure for Rome in late 1508, that is after his first encounter with Bartolommeo’s God the Father Altarpiece. But while one stops short of claiming that Raphael did not discover the cloud putto for himself, especially since we happen to possess two of Raphael’s sketches of Filippino’s cloud putti on vaults of the Strozzi Chapel (c. 1508), it is possible that Raphael did learn something of the theological import of the cloud putto from Bartolommeo.

Whatever his sources, Raphael certainly understood the cloud putto’s underlying theology. It might be argued, in fact, that Raphael made the clearest demonstration of any Renaissance artist of the very reasons for the cloud putto’s deployment. His first work with cloud putti, the Disputa (c. 1509), makes this point clearly. In this fresco, a series of cloudbanks rise above the theologians on the ground, serving as the setting for a hierarchical display of the heavens. On the lowest of these cloudbanks, one sees the heads of flesh-toned putti peeking through grayish cloud, while on the highest cloudbank encircling the golden dome of the heavens, the putti heads are formed out of the grey matter of the cloudbank itself. The ordering of the putti—fleshly putti below, cloud putti above—reflects how the lower putti,
by being closer to the earth, are more fully accessible to the physical eyes of men. By ordering his cloud putti in this manner, Raphael thus pictures the process behind the physical visionary as a coming into visibility through the progressive condensation and coloration of vapor in the air.

Yet Raphael's greatest exposition of the theology of the cloud putto takes place in his *Madonna di Foligno* and *Sistine Madonna*. In the first, Raphael shows the cloud putto as emerging from the cloud that supports the Madonna and Child (Figure 12). These putti seem to be actively engaged in their own materialization, pushing back the cloud's billowy surface in places so as to uncover and model their bodies. A rainbow in the landscape behind the apparition indicates that the gray cloud has come in the wake of a passing storm. In so far as it embodies drama and a disruption of natural norms, the storm gives an appropriate justification for the presence of the apparition, while also constituting the appropriate medium from out of which the cloud putti themselves form. In such a remarkable demonstration of the condensation of clouds, then, we have one of Raphael's most sophisticated statements of the theology of the physical visionary in his painting. The operations of the weather set up the context for a physical presentation of the apparition, with the physical mechanics of the vision explained by the cloud putti themselves.

For the viewer, the cloud putto might work here like an explanation, the suggestion being that the whole of the apparition, Virgin and Child included, is but an angelic simulacrum of the divine personages, not a presentation of real persons.

Raphael's *Sistine Madonna* has long perplexed commentators on account of its green curtains. So real do these curtains seem that it has been said that they are meant to represent *trompe l'oeil* hangings resembling those hung over sacred images in churches in the period. The apparition, according to one argument, is but a portrait of a vision, a picture of the divine, rather than an actual presentation. With a fuller understanding of the cloud putto, however, these interpretations of the *Sistine Madonna* become more problematic.

At first, the cloud putti in this painting would seem to play a minor role in its meaning, for Raphael gives only the slightest indication of their heads forming in the light of the glory cloud. Yet it may be considered now whether the altarpiece shows a picture of an unseen vision, or rather something real, a physical visionary phenomenon invading the viewer's actual space beyond the curtain. Indicative of the very mechanics of physical apparition before the bodily eyes of the viewer, the cloud putto underlines the ways in which mere mortals may have direct access to the supernatural in fully physical terms.

But perhaps it is improper to say that any sacred image of the Italian Renaissance merely strove to present the visible appearance of the apparition. Although the cloud putto was an explanation of a physical process, a justification for the inclusion of bodiless beings in the visible world of the painting, it also served to jolt the spiritual imagination of the beholder. Confronted with the cloudy image of these putti, the devout viewer might have been inspired to seek beyond physical forms, to find unspecified
spiritual content, and to discover the divine beyond the image. Possibly the greatest benefit of the cloud putto, then, was that it approximated an internal experience, common to artists and contemplatives, where one is prompted to picture new and unseen images. The cloud putto, in sum, could inspire a form of devotional experience, showing that if one might see only a little farther, or make out the emergent form of a cloud putto, one might finally glimpse what it means to “see” beyond seeing itself.

Notes


3 For example, Jacopo della Quercia’s festoon-bearing putti from the Tomb of Ilaria del Carretto at S. Martino, Lucca, of 1406, or Donatello’s music-making and dancing putti for the tabernacle of the Baptismal Font in Siena of 1429.

4 For example, Donatello’s Madonna of the Clouds (c. 1430–35) in Boston.

5 See Thomas Aquinas, Summa Theologica, trans. Fathers of the English Dominican Province (1948; reprint, Westminster: Christian Classics, 1981), pt. I, q. 50, art. 1, where angels are described as absolutely intellectual, and thus immaterial, creatures. Here Aquinas notes that the ancients could only recognize the physical and imaginary aspects of angelic beings. Many of the earliest Renaissance putti derived from ancient Bacchic-themed sarcophagi showing reveling—and often drunken—putti. See Dempsey, Inventing the Renaissance Putto, 64.

6 While the putto had precedents in medieval sculptural decoration, Donatello was the first artist to revive the full form and spirit of the antique putto; ibid., 26–8.

7 It may be that Donatello may have tried to show putti merging into the substance of clouds in his Madonna of the Clouds. See Shearman, “Raphael’s Clouds, and Correggio’s,” 661.


11 On the influence of the Sentences as a dominant theological text into the sixteenth century, see Philipp W. Rosemann, Peter Lombard (Oxford: Oxford University Press, 2001), 125.


14 Ibid.

15 Ibid., bk. II, dist. 8, q. 1, a. 2.


18 Aquinas, *Scriptum super Sententias*, bk. II, dist. 8, q. 1, a. 3: “Unde quantum ad finem apparitionis, oportet ut sint illae proprietates secundum similitudinem tantum, ut non intelligatur illis subesse aliqua res, nisi Angelus; ut quasi corpus Angelus esse videatur, et proprietates ejus sint proprietates Angeli. Si autem quaeratur de secundo, quale sit quantum ad materiam, dicendum est, quod materia corporis assumpti ab Angelo, potest considerari dupliciter: vel quantum ad principium assumptionis, vel quantum ad terminum. Si quantum ad principium, sic dico, sicut in littera dicitur, quod assumit de aer, propter hoc quia aer maxime transmutabilis est, et convertibilis in quaecumque; et hujus signum est, quod quidam videntes corpus a Daemone assumptum, scindere gladio vel perfodere volentes, id efficere non valuerunt, quia partes aeris divisae statim continuantur. Sed propter hoc quod aliquam figuram recipere possunt competentem Angelo apparentem, oportet quod quantum ad terminum assumptionis aer iste sit in aliquo inspissatus, et ad proprietatem terrae accedens, servata tamen aeris veritate: quod efficere possunt tum per motum localem congregando partes, tum etiam per semina in elementis respersa, ut prius dictum est.”

19 Ibid.

20 Ibid.


23 Ibid., 43.


27 Giorgio Vasari, Le Vite de’ più eccellenti pittori scultori e architettori (1568), ed. Rosanna Bettarini and Paola Barocchi (Florence: Studio per Edizioni Scelte, 1976), vol. 4, 62: “Fermavasi talora a considerare un muro dove lungamente fusse stato sputato da persone malate, e ne cavava le battaglie de’ cavagli e le più fantastiche città e’ più gran paesi che si vedesse mai; simil faceva de’ nuvoli de l’aria.”


29 One might also note the heads of cloud in Mantegna’s Minerva Expelling the Vices from the Garden of Virtue (1499–1502).


33 Peter Humfrey, Painting in Renaissance Venice (New Haven, CT: Yale University Press, 1995), 71ff.

34 Shearman, “Raphael’s Clouds, and Correggio’s,” 660, also notes cloud putti in Bellini’s Blood of the Redeemer (c. 1460–65) in London, but the designation is unconvincing, for the putti are a different color than the clouds beneath them.


439–40, no. 37. The cloud putti are noted by Shearman, “Raphael’s Clouds, and Correggio’s,” 660.


40 Even beyond these monumental fresco decorations, Filippino’s concept of the cloud putto made its way into Florentine painting: one of his assistants in Rome, Raffaellino del Garbo, incorporated cloud putti into his devotional paintings, for example Madonna and Child with St. Joseph and an Angel in the Metropolitan Museum (14.40.641). Note that this painting has been occasionally attributed to Filippino himself. See Geiger, Filippino Lippi’s Carafa Chapel, 79, n. 28.

41 Lightbown, Mantegna, 156–60, 433–5.


43 Titian’s first visit to Central Italy was his trip to Rome in 1546.


45 Shearman assumed the invention was Raphael’s. Shearman, “Raphael’s Clouds, and Correggio’s,” 660.


49 Although it is generally thought that Raphael could not have seen Bartolommeo’s altarpiece before his departure for Rome in late 1508, a frequently overlooked drawing in the Louvre, a copy after one of Raphael’s compositional ideas for the Disputa, demonstrates otherwise, showing how Raphael took up some of Bartolommeo’s ideas like the figure of God the Father and the glory cloud. On the drawing, see John Shearman, “Raphael’s Unexecuted Projects for the Stanze,” in Walter Friedlaender zum 90. Geburtstag: Ein Festgabe seiner europäischen Schüler, Freunde und Verehrer (Berlin: Walter de Gruyter, 1965), 158, n. 2. See also Dominique Cordellier and Bernadette Py, Raphaël, son atelier, ses copistes (Paris: Réunion des Musées Nationaux, 1992), 107–9.
Note that Luca Signorelli’s *Resurrection of the Flesh* at Orvieto (c. 1499–1503), possibly known to Raphael from drawings, was probably not the source for Raphael’s cloud putti. Signorelli’s cloud putti are not fully integrated into the nebulous substance of the clouds in the fresco, making them unlike Raphael’s. It remains to be determined how Signorelli came to know the device himself.


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In David Michael Kleinberg-Levin’s *Gestures of Ethical Life*, the author explores the phenomenological idea of “right measure” in political life, highlighting how gestures reveal a deeply embedded redemptive understanding of human existence. Lamenting the loss of ethical gesture in Modernity, Kleinberg-Levin examines the philosophical context of human measure in ancient Greek thought and its enduring influence on modern thinkers, such as Friedrich Hölderlin and Martin Heidegger. This philosophically oriented view of measure provides a background to my investigations of Renaissance perspective, particularly in regard to the manner in which pictorial space constitutes a communicative framework for bringing human gesture into appearance.

During the Renaissance, the estimation of virtue in human action was paramount to ensuring order and decorum in cultural practices. This was manifested in a variety of ways, from witnessing civic and religious rituals to communicating through language and manners. It was, however, in the iconography of pictorial space that notions of decorum were to find their most fertile expression. Indeed, as I will argue, the ideal situations represented in perspective served as an abiding background condition in Renaissance society, against which the circumstances of actual political and religious life could be visibly and symbolically measured. Accordingly, this modality of measure—redolent of the Roman notion of *ratio*—takes place in the light of “the citizen’s participation in the civic life of the state, a measure constitutive of speech, the public and political use of reason.” Such a notion of “participatory measure” should be seen in the context of the priority given to human action (*vita activa*)—as opposed to contemplation (*vita contemplativa*)—during the Renaissance, which constituted the principal means of demonstrating continuity with an onto-theological order.

This chapter explores the idea of measure through an examination of Raphael’s *School of Athens* (Figure 15), highlighting how perspective operated as both a visual and eidetic scaffold to facilitate a dialogue between the symbolic themes underlying the manifold gestures of the figures and the ideas and actions
of the beholder, in this case the Pope. Evident throughout this hermeneutic
dialogue is what I describe as the “destinal” nature of human gesture—a term
more familiarly applied to Heidegger’s idea of the “forward-directedness” of
human existence. In this interpretation, authentic historiography—that is a
historiography that does not merely treat recorded history as a reflective exercise
of “what has been”—is construed as an accumulation of past events that sets
in place what Charles Guignon describes as “futural projection.” Accordingly,
“Histioriography begins … with an anticipation of where the course of world
events is going overall” that at the same time is interpreted by the historian as
expressive of his own situation and ultimate destiny.

This phenomenological view of historiography helps us to understand
Renaissance/humanist views of the past as a series of inter-connected paradigmatic
events that impinge upon the circumstances of the present. Seen in the context of
the School of Athens, the “destinal” is conveyed as an inter-relationship between
pictorial space, historiographical narrative, and human gesture, whose combined
effects provided the basis for envisioning the Golden Age. More specifically, this
inter-relationship can be summarized through the representation of hands—and
their related or supporting material (books, scrolls, tablets, and so on)—that guide
the viewer across the visual plane of the fresco, between the vanishing point of
the perspective to the actual space of the room beyond.

I will seek to argue that an understanding of the School of Athens in these
terms provides a useful methodological framework for revealing a continuity
between Eucharistic and Pythagorean-Platonic traditions—a continuity that
draws within its perspective web a “mytho-historic” concordance between
contemporary events and those of Judeo-Christian and classical pasts.

Geometry as heritage

The School of Athens forms part of a cycle of frescoes in the Stanza della
Segnatura, commissioned by Julius II and executed by the young Raphael
Sanzio at the beginning of the sixteenth century. The Stanza forms part of
the Papal Apartments in the Vatican, and is thought to have been used as the
private library of the pope, as evidenced by the abundance of written matter
highlighted in the frescoes.

The cycle can be conveniently divided into four principal zones, defined by
the four walls of the Stanza, the School of Athens on the east wall, the Disputa
on the west wall, the Parnassus on the north wall, and finally, Jurisprudence
on the south wall. The underlying themes of the four frescoes—Philosophy,
Theology, Poetry, and Justice respectively—form part of a single iconographic
program that draws upon the traditional library system of ordering and
cataloguing knowledge, in facultatibus. According to Manfredo Tafuri, the
frescos also constitute a “manifesto” of the urban and architectural projects
of the Pontificate of Julius II. In the case of the School of Athens, this refers
to developments in the Vatican Library which were begun in earnest by the
fifteenth-century popes Nicholas V and Sixtus IV, the latter Julius II’s uncle.
As implied in the title, the School of Athens is a celebration of Greek philosophy and science, represented as an assembly of classically dressed figures in various poses. These are arranged in loosely defined groups that comprise sages, admiring onlookers, and accompanying written and printed matter. The scene, moreover, is surrounded by a monumental architectural ensemble—in the form of a barrel-vaulted structure—orientated along the central axis of the perspective. This frames two principal figures standing in the middle ground of the fresco, identified as Plato and Aristotle. The gestures of both seem to reverberate in the interlocution of the surrounding groups, like ripples in water, giving the overall effect of a procession. This reverberation could be said to define three aspects of the philosophical spectrum: on the left, Grammar, Arithmetic, and Music; on the right, Geometry and Astronomy. Finally, the middle ground constitutes the zone of Rhetoric and Dialectic.\footnote{Raphael, School of Athens, c. 1509–10, Vaticano, Stanza della Segnatura. Photo credit: akg-images/ Erich Lessing}

As if to make explicit the different philosophical positions of Plato and Aristotle, and their surrounding retinues of figures, the supporting architectural ensemble is embellished by two large statues located on the extreme left- and right-hand sides, Apollo and Minerva. The former is representative of music and poetry, while the latter champions wisdom and reason. Critically, moreover, each invokes different senses—of hearing and seeing respectively—on which, as Meredith J. Gill explains, “Augustine and Petrarch, as well as Augustinians themselves, ardently on the trail of Plato, had lingered with such attentiveness.”\footnote{12}

The “forward movement,” conveyed in the overall composition of the fresco, is not, however, represented as a consciously intentional act—as something guided by an explicit directionality. Instead, the fresco portrays, through the
gestures of the figures and their suggestive alignments with the underlying perspective, an almost inadvertent “realization” of some indeterminate destiny. This destiny is defined in iconographic and spatial terms by the scene of the Disputa fresco opposite, the embodiment of divine—as opposed to human—knowledge.\(^\text{13}\)

A key to understanding this complex inter-relationship between gesture and perspective is the notion of “geometric thinking.” Pervading the fresco is the role of geometry as a philosophical “tool” which reveals higher truths, redolent of Plato’s Timaeus and Meno. This treatment, moreover, takes on a distinctly humanist character in the School of Athens in the way the representation of geometry is conceived as part of a mytho-historical continuity that culminates in the promise—or expectation—of the Golden Age.

To explain this idea further, I will refer to an essay by the German philosopher Edmund Husserl entitled “Origin of Geometry.”\(^\text{14}\) Husserl argues that before the period of Galileo, in the late sixteenth and early seventeenth centuries, geometry was comprehended at two inter-related levels. Firstly, geometric principles were revealed to the enquirer through independent enquiry, and therefore treated as if an original discovery. Secondly, they were communicated in the form of “historical entities,” handed down as a tradition from one generation to another.

In this twofold interpretation, which could be understood in synchronic and diachronic terms respectively, Husserl draws upon the Platonic notion that eternal truths are embedded in the human soul, and are only gradually revealed to the beholder through a process of anamnesis: the idea that the acquisition of knowledge becomes a process of “recollection” rather than of learning ex nihilo. In one sense, Husserl could be said to “externalize” the Platonic notion of eternal truths by treating geometric principles as historical entities that exist in perpetuity by virtue of their continual rediscovery.

Given this philosophical background, the School of Athens is a vitally important work in the history of ideas since it attempts to historicize the Platonic notion of geometric knowledge.\(^\text{15}\) Furthermore, the act of “handing-down” geometry as heritage is made legible in the fresco by the correspondence between symbolic narrative, perspective alignments and human gesture. This inter-dependence between the scaffold of pictorial space and the situational drama of discoursing figures serves as the framework for construing the “destinal” metaphorically as a journey of redemption.

**Gesturing through perspective**

To explain the meaning of the “destinal” in the School of Athens adequately, it is necessary to examine, in the first instance, the relationship between the figures of Plato and Aristotle. It has been argued that the pairing of both philosophers was intended to reaffirm their equal status in Renaissance culture; that the two great pillars of Western philosophy are seen as “mutually” inter-dependent
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and therefore supportive of a unified body of knowledge. Both Pico della Mirandola and Nicolas Cusanus suggested such level-pegging in the fifteenth century. However, it is well known that the early sixteenth century witnessed a renewed interest in Platonic philosophy that seemed to convey more consistently—in the role of Plato as the “Attic Moses”—the principle of a pre-Christian theology (prisca theologia). This “archaic” theology was deemed prophetic of the Golden Age of Christ and its progeny in the Apostolic Succession. What is evident here is that the drive towards an inherited mytho-historical tradition in the Renaissance, rooted in the principle of revealed truth characteristic of Christian/Neoplatonic thought, tended to take precedence over the earlier dominating role of Aristotelian natural philosophy during the Middle Ages.

When considered in the context of the School of Athens, this revival of Platonic tradition has a certain resonance. Juxtaposed, both Plato and Aristotle present their respective philosophical principles through their disputing gestures. In the case of Plato, his right hand is shown pointing upwards towards the sky, indicating the idea that true knowledge lies not in this world, but in some higher sphere embodied in the spirit—or spiritus. Aristotle, on the other hand, has his right hand extending horizontally outwards toward the picture plane, suggesting that true knowledge can only be found in this world through consciousness—or sensus. Significantly, the right-hand gestures of both philosophers are echoed in their respective left-hand articulations. In the case of Aristotle, the philosopher is shown clasping a book, with the title “Etica” (Ethics) printed horizontally along its base and partially visible behind Aristotle’s hand. Poised at an angle, between the philosopher’s hand and thigh, the articulation of the tome reinforces the gesture of Aristotle’s right hand with its horizontally projecting shadowed palm. In a similar vein, Plato’s left hand is shown holding a volume with the title—“Timeo” (Timaeus)—indicated on the spine of the book. Positioned vertically, and set within the plane of the upright figure, the tome seems to mimic Plato’s right-hand upward gesture.

In this duplicity between hand and text, we are led to construe gesture in metonymic terms, as a visual expression of verbal dialogue between both philosophers. But this apparently balanced relationship only conceals a subtext in the reading of the whole fresco. Of all of Plato’s dialogues, the Timaeus was the only work that was known throughout the Middle Ages, thanks largely to various unfinished Latin translations, second-hand interpretations, and commentaries. Moreover, during the Renaissance, the Timaeus was increasingly venerated as a meditation on cosmology that could be compared to the creation narrative in Genesis. Indeed, among all the ancient texts that were scrutinized by humanists and Neoplatonists, the Timaeus was seen as an ancient “precursor” to the Bible, and therefore as the most suitable prelude to the mystery of the Eucharist.

Given the importance of the Timaeus in the Renaissance, it is perhaps not surprising that Plato’s left hand should coincide with the vanishing point of the fresco. While it is generally the case that vanishing points in Renaissance
paintings were not the locations of important symbolic elements, the example of the School of Athens would seem to suggest otherwise. This relates to the idea of the Timaeus as a symbolic “signpost” in the spiritual journey of the destinal—or præeparatio evangelica—from where the first signs of Trinitarian symbolism are revealed in geometric terms. This could be said to culminate in the Disputa fresco opposite, whose monstrance—the vessel used in Catholic liturgy to present the consecrated host of the Eucharist—similarly coincides with the fresco’s vanishing point. As Meredith J. Gill points out:

The vanishing points in the School of Athens and in the Disputa—behind the deliberating philosophers, and at the Host—connect to the unfolding of each multfigured tableau into the real space of the room.

However, by virtue of the non-orthogonal configuration of the Stanza della Segnatura, the vanishing points of both frescos do not align, but are instead located in different parts of the room. While a product of a pre-existing situation, the resulting shift should not be seen as an inconsistency in the iconography, but rather as an integral part of its program. This relates to the idea of a gap—in the Cusanian sense—between human and divine knowledge, between finite human existence and the infinity of God. We are reminded, in this “hiatus” between the vanishing points of the School of Athens and the Disputa, of the role of the “catechumenate” in early Christianity: the period before baptism when the neophyte prepares for conversion through prayer, readings, and vigils.

The centrality of Plato in the fresco takes on a deeper significance when viewed in the context of the surrounding assembly of figures. Indeed, the perspective construction of the fresco leads us to consider the position of Plato, and his symbolic role as “Attic Moses,” in relation to the articulation of certain groups of figures. An indication of this relationship can initially be found in Raphael’s cartoon for the School of Athens. Here the central zone of the drawing, below the figures of Plato and Aristotle, was originally left empty before Raphael’s later insertion of the slumbering Diogenes. The resulting arrangement draws the observer’s eye from the two principal philosophers to the figures occupying the periphery of the scene, on the left- and right-hand sides. In the final depiction, this triangular relationship between center and periphery is consolidated by means of a more clearly legible pictorial construct, registered in the gridding of the floor pavement in the lower part of the fresco. Here we see the underlying perspective rays, emanating from Plato’s left hand and extending across the terrain of the pavement, being “mediated” by various elements such as books and figures; for example, to the left an inclined book, held by a standing figure identified as Parmenides, guides the viewer to the retinue of figures in left foreground, while the isolated figure reclining on steps—indicated earlier as Diogenes—directs the observer’s eye to another cluster of figures in the right foreground. These connecting “threads,” and their supporting iconographic narratives, provide a visual itinerary of the destinal that culminates in the Disputa opposite.
To establish a clearer sense of the nature and meaning of the destinal in the *School of Athens*, it is necessary to identify the key figures—the “sages” referred to earlier—in the groups outlined above. Both sages are represented recording information from small slate tablets, variously located on the pavement and forming the focus of attention of each group. On the left, we see a bearded scribe crouching—with an open book on his lap—recording information from the slate. To his immediate left is a youthful angelic figure shown orientating the slate in the direction of the scribe. In the right-hand retinue of figures is a bald-headed sage represented bending over, with dividers in hand and measuring the contents of the other slate tablet placed flat on the ground.

The identification of both figures is fairly certain, based largely on their locations in the frescos and on the contents of their respective slates. The former premise refers to the division of the fresco—outlined earlier—between the senses of hearing and seeing, as signaled by the statues of Apollo and Minerva. The slate on the left-hand side shows the familiar triangular arrangement of the Tetractys (1+2+3+4=10) in Roman numerals, above which is a representation of the Pythagorean theory of harmonic ratios in the traditional form of a lyre. Labeled in Greek letters, this second configuration is highlighted with the octave (diatessaron), the fifth (diapente), and the fourth (diapason). Combined, both elements—and their relation to the symbolism of Apollo—suggest that the bearded figure can only be Pythagoras himself, the Pre-Socratic philosopher and mystic who it was believed conceived the idea that the universe is composed of whole-number relationships made audible in the “music of the spheres.”

The figure on the right, on the other hand, is most probably intended to represent Euclid, indicated by the geometric configuration on his slate. This reveals two interlocking triangles, each approximating to an equilateral triangle. The significance of the geometry has been the subject of some speculation among scholars. One interpretation is that the geometry was used to construct the architectural layout in the *School of Athens*, as indicated when the geometry is superimposed over the fresco. Related to this, however, is the significance of the internal geometry—a six-sided figure—created by the overlapping/intersecting triangles. Conceived as a hexagon in “embryonic” form, on account of its biaxial symmetry, the configuration is highlighted with two parallel lines connecting its internal corners, and a diagonal formed between these lines. As I say elsewhere: “The significance of this geometry is not hard to recognize when we examine Euclid’s demonstration of the so-called Theorem of Pythagoras in Book 1 (Proposition 47) of the *Elements* .... [I]mplicit in the geometry of the hexagon are the very ratios that constitute Platonic cosmology.”

The location of Pythagoras and Euclid in the composition of the *School of Athens* serves to underpin the primacy of Plato in the overall iconography of the fresco. Referring again to Husserl’s “Origin of Geometry,” we begin to see how Pythagoras and Euclid constitute anchor points in the idea of geometry as heritage that is handed down and rediscovered throughout history.
As predecessor and successor to Plato respectively, Pythagoras and Euclid reveal through their respective historical situations the continuity of numerical and geometric ideas, between discrete units and extension.

In the School of Athens, we are led to construe this continuity initially as a discursive and intellectual progression that begins with a constellation of whole numbers and leads to a series of geometric canons which build upon a new optical view of order. Critically, Plato’s Timaeus provides the initial confluence of this progression by attempting to combine previously irreconcilable relationships into a unified cosmology. In one sense, Plato’s cosmology fulfills the Renaissance quest for an all-compassing—universal—vision of order, in which everyday actions must be judged on the basis of their eternally valid counterparts.

Following the ideas of such Renaissance Neoplatonists as Marsilio Ficino and Giles of Viterbo, the contents of the two slate tablets and the volume of the Timaeus—the three “nodal” points in the triadic relationship between Plato, Pythagoras, and Euclid—foreshadow Trinitarian symbolism, embodied in the mystery of the Eucharist. This presage to divine Grace is revealed in the fresco through the symbolism of the triangle in its various formulations, from its role as a generative unit in Platonic/Pythagorean cosmology to its status as the primary geometric system in Euclid’s Elements. It could be further argued that this second stage, indicative of the emerging “geometrization” of the universe prevalent in early modern science, leads us to construe the role of the triangle in relation to perspectiva naturalis, the “precursor” to perspectiva artificialis. In this series of links, therefore, perspective should be understood not as an abstraction or autonomous “method” of pictorial space—outside the content and meaning of the fresco—but rather as a symbolic form that constitutes the culmination of geometry as heritage. Hence, perspective becomes the representational paradigm of redemptive space, of which the Host—located at the vanishing point of the Disputa opposite—serves as its apogee.

We are given a sense of this progression in the role of St. Augustine in the iconography of the Disputa. As the “conduit” of Christian/Platonic wisdom, between Late Antiquity and Renaissance humanism, St. Augustine’s theology played a key role in the iconography of the Stanza della Segnatura. This is partly affirmed by his prominent appearance in the Disputa; positioned close to the Host and next to St. Ambrose, St. Augustine is easily identifiable by a volume of his De Civitate Dei represented at the base of the altar at his feet. As Gill argues: “Between the [School of Athens and the Disputa], one might say that Augustine’s search for Wisdom is concluded in the dialogue between Philosophy’s scientia and Theology’s sapientia.”

This “dovetailing” between scientia and sapientia is further emphasized by other associations given to the figures of Pythagoras and Euclid in the School of Athens. Giorgio Vasari tells us that Pythagoras is in fact St. Matthew, partly on the basis of his assumption that the supporting figure, on Pythagoras’ left hand side, is an angel—the symbol of the Evangelist. While Vasari’s
assertion has been dismissed by academics, on account of the biographer’s rather muddled descriptions of the frescos in the Stanza della Segnatura, it is worth reconsidering the claim here. A characteristic feature of the School of Athens is the idea of “double identity”: that many of the figures in the fresco were intended to have more than one association. We see this, for example, in the representation of Plato, which is in fact a portrait of Leonardo da Vinci. In the case of Pythagoras as St. Matthew, a clue to this association can be found in contents of the slate tablet. Upon closer observation, it is not difficult to recognize, in the curve-shaped superstructure (the lyre) and support (the tetractys), the foot, stem, and cup of a chalice, perhaps evoking the idea of Pythagorean cosmology as a prefigurement of the Holy Grail. Such visual metaphors were fairly commonplace in Renaissance iconography, as evidenced, for example, in the Hypnerotomachia Poliphili, published in 1499, relating to an underlying hermetic tradition in Renaissance culture. Significantly, Giles of Viterbo, chief spokesman of Julius II and leading Neoplatonist, believed that Pythagoras was the first to recognize the “glimmerings” of Trinitarian thought.

The figure of Euclid on the right-hand side, moreover, is identified by Vasari as Bramante, on account of its features—bald head and muscular body—commonly associated with the great architect. Indeed, the appearance of this figure is remarkably similar to the frontispiece of a pamphlet entitled Antiquarie prospetthiche romane, printed around 1500 and attributed to Bramante himself. In this work, which is dedicated to Leonardo da Vinci, the author calls himself “Prospettico melanese depictore” (“Mr. Perspective, a painter from Milan”). As one of the leading perspectivists of his day, Bramante may well have assisted Raphael in the construction of the perspective layout of the School of Athens. Given this second identity of Euclid as Bramante, it reinforces the idea of continuity between Euclidean geometry and Renaissance perspective, thereby enhancing the argument—referred to earlier—that the geometry of Euclid’s slate forms an underlying structure to the perspective of the fresco.

Piety and triumphalism

As a Franciscan and warrior pope, noted for his belligerence, Julius II may well have been reminded in the School of Athens of his own fallibility and humanity. Indeed, given the function of the Stanza della Segnatura—as the private library of the pope—it seems plausible that its iconography was influenced in part by the multiple roles of Julius II. This could best be summarized under two key areas: as key-bearer of the Church—and therefore “descendant” of St. Peter—and as the “second Caesar.” From the point of view of the School of Athens, it could be argued that the piety of the Franciscan pope is being “measured” against St. Augustine’s idea of the peregrinatio, the basis of continuity between scientia and sapientia. While Julius II was not a “bookish” pope, like his uncle Sixtus IV and successor
Leo X, it is evident that he recognized—largely through his chief spokesman and Augustinian friar Giles of Viterbo—the central role of Platonic philosophy in the “preparations” for the Golden Age. This is further amplified by Julius II’s initiative to continue expanding the Vatican Library in emulation of the successes of his uncle. We are reminded, moreover, of Julius II’s papal credentials in the portrait of Gregory the Great—in the adjacent fresco of Jurisprudence—where the thirteenth-century pope is represented as Julius II approving the Epistolae decretales.

In regards to the role of Julius II as “second Caesar,” the School of Athens provides an interesting—if equivocal—allusion to this symbolism. This relates to the monumental portal that frames the assembly of philosophers in the fresco. From a plan reconstruction of the perspective it is apparent that the architecture is in the form of a square-shaped arch that has been likened to the Greek cross plan of Bramante’s scheme for the new St. Peter’s Basilica. It may also refer to a “Janus Quadrifrons,” the ancient gateway dedicated to the Etruscan/Roman guardian of doors and passageways. Significantly, the association of St. Peter’s with a Janus arch is alluded to in a sermon delivered by Giles of Viterbo in 1507 in the basilica, in which the Augustinian friar describes the papal cathedra as the “Etruscan throne of Janus.” Furthermore, implicit in the symbolism of the Janus Quadrifrons is its role as a triumphal passageway. This is indicated in the route of the ancient Via Triumphalis, which is said to have passed through a “Porta Triumphalis” and an “Arcus Iani,” the former often described and represented as a quadrifrons. The route passed between the Vatican—the “territorium triumphalis”—and the Capitoline. It is unlikely that either Bramante or Raphael would have overlooked the triumphal symbolism of the Janus Quadrifrons in their respective designs for the basilica and the School of Athens. The symbolism, moreover, would seem to be supported by the articulation of the figures in the School of Athens, particularly the central figures of Plato and Aristotle, which I earlier described as a procession.

Quite how this triumphal symbolism has relevance to the iconography of the fresco is suggested initially by the idea of Rome as “Athens reborn,” or more specifically, by the status of the Vatican Library as the new Platonic Academy. The alliance between both cities was not a Renaissance invention, but must be seen in the context of Julius Caesar, who “claimed the Greek inheritance” in his role as triumphator.

On the face of it, the representation of philosophers—in the School of Athens—and theologians/Church fathers—in the Disputa—would seem to have very little to do with triumphal symbolism, at least in its martial sense. But this only overlooks the analogies, expressed by Church fathers, of the Christian life as a continual battle against sin and of the pre-baptismal catechumenate as its “preparation.” In the case of Julius II, however, the warrior pope and Franciscan would perhaps have interpreted the reference in more literal terms. This centers on the notion, cultivated by Bramante and others in the papal court, of Julius II as the “second Caesar.”
Seen in the context of the idea of geometry as heritage, it is worth speculating that the articulation of the triumphal portal surrounding the attending philosophers in the *School of Athens* fresco—in terms of both its proportional systems and its perspective representation—was intended to reaffirm the centrality of Platonic cosmology in the presage to the mystery of the Trinity. In the procession from philosophy to theology—from the *School of Athens* to the *Disputa*—we witness the transformation from metaphysical/philosophical enquiry—conveyed in the constellation of geometrical demonstrations and “discoveries”—to the realization of the Golden Age as an actual possibility, expressed in the *Disputa* as a building-site; this feature of the fresco is visible behind the attending Church fathers and popes, in the lower tier of the fresco. In the pope’s many and varied activities—from writing papal bulls to undertaking military action—the *School of Athens* would have served, in the privacy of his personal library, as a visual reminder of the staging posts in the journey to a new Golden Age.

**Conclusion**

The triadic relationship between Plato, Pythagoras, and Euclid, communicated through the perspective articulation of the *School of Athens*, provides one of the keys to understanding the complex iconography of the fresco. While a more detailed investigation of the iconography is beyond the scope of this study, it is evident that Raphael was seeking to convey a particular historiographical understanding of philosophy that was fundamentally different from the modern concept of progress—of a “linear history.” In more equivocal terms, the symbolic narrative of the fresco conveys the idea of temporality as a constellation of moments—or “nuggets” of enlightened intellectual discovery and creative development—that are bound together by a sense of their interdependence and relevance to the contemporary situation in early sixteenth-century papal Rome. Moving from the particular to the general—from the gestures of individual figures to their locations in the overall scenography of the fresco—we encounter the gradual accumulation of meanings that leads to the *praeparatio evangeli*, or preface to the Gospel.

As I have sought to highlight in this chapter, the inter-relationship between figurative gesture, historiographical narrative, and perspective constitutes in the visual presage to salvation a symbolic “armature” of the destinal. It reveals through its varied trajectories of discoursing figures the progression from human to divine knowledge. By subjugating the corporeal to the linear, the drama of redemptive history is re-enacted through the visible demonstration of geometry as an inherited tradition. From its initial stages as “objects” of philosophical dialogue, geometry is transformed into the exemplary space of human action, the basis on which the Golden Age was conceived as an actual possibility.
Notes


2 Ibid., 237.

3 As Quentin Skinner states, during the Renaissance, “the life of negotium, the vita activa civilis, is always to be preferred.” Charles Bernard Schmitt et al., eds., *The Cambridge History of Renaissance Philosophy* (Cambridge: Cambridge University Press, 1991), 420.


5 Ibid., 397.

6 Ibid.


11 Marcia Hall, ed., *Raphael’s School of Athens* (Cambridge: Cambridge University Press, 1997), 34.


To explore further the School of Athens in the context of the history of ideas, see Christiane Joost-Gaugier, *Raphael’s Stanza della Segnatura: Meaning and Invention* (Cambridge: Cambridge University Press, 2002).

Temple, *Disclosing Horizons*, 53.

Ibid.


I am grateful to J. V. Field for drawing my attention to the issue of vanishing points in Renaissance paintings.


Temple, *Disclosing Horizons*, 64. We are given an indication of the underlying importance of the hexagon in the *School of Athens* by the conspicuous hexagonal coffering that adorns the barrel vault over the central part of the fresco. The perspective effect of this coffering could be compared to the “compressed” appearance of the hexagon formed by the interlocking triangles in Euclid’s slate.

Gill, *Augustine in the Renaissance*, 211.


For further discussion of this association, see Temple, *Disclosing Horizons*, 62–3.


Temple, *Disclosing Horizons*, 62.


Temple, *Disclosing Horizons*, 56.

For a detailed account of this connection, see N. Temple, *Renovatio Urbis: Architecture and Topography in Rome during the Pontificate of Julius II* (PhD Dissertation, Leeds Metropolitan University, 2000), 373–81.


For an interpretation of the architectural elements in the *Disputa*, see Temple, “Renovatio Urbis,” 336–45.
Seeing and the transfer of spirits in early modern art theory

Thijs Weststeijn

Me miro en lo que miro
como entrar por mis ojos
en un ojo más limpio
me mira lo que miro
es mi creación esto que veo
la percepción es concepción
agua de pensamientos
soy la creación de lo que veo.

Octavio Paz, “Blanco”

In 1590, as Gregorio Comanini recounts, Father Ascanio Martinengo and the courtier Stefano Guazzo, author of *La civil’ conversazione* (1574), went to the painter Giovan Ambrogio Figino to talk about the visual arts. Figino was ill, and they discussed around his bed—Martinengo’s first remark immediately involving Plato’s dialogues as well as Aristotle, Galen, and Averroes. The stage was set for a serious bout of name-dropping. The three discussed a variety of themes relating to painting, extending to sophisticated philosophical and medical notions.

This also involved vision, a subject which was analyzed through the ideas of Marsilio Ficino, who, in *Theologia Platonica* (1482), had postulated the existence of ocular rays made out of invisible “spirits.” According to his theory, the blood contained in the heart is heated through emotional arousal and rises upwards to the head, in the process losing some of its material aspect. It ultimately finds its way out through the eyes, diluted into very subtle rays of light. To quote from Comanini’s *Il Figino* (1591):

The spirits come from the blood, and the spirits are like the blood that produced them. For that reason, the spirits of the young are delicate, moist, and sweet. These spirits produce certain rays, and the rays resemble the spirits that produced them. They spring from the eyes as if from two glass windows, because these shining sparks, being light, flow from the lower members to the highest parts of the body. On reaching the eyes, which are transparent and pure, they have a free and easy exit. Those animals whose eyes shine at night and the circles one sees on rubbing the corner of an eye with a finger give
evidence of these rays, as does the example of Tiberius, who, when he got up at night, was able to see for some time with no light other than that of his eyes.

This straightforward linking of the activity of seeing to a force “beaming out” of the eyes reveals a main element of the theory of vision expounded in Comanini’s book: in contrast to modern notions, visual rays are not expected to move from object to eye, but from eye to object. As ocular “spirits” stem directly from the viewer’s mind, looking at someone may “infect” that other person with one’s own passions:

Ficino says moreover that a spiritual vapour issues with these rays, and that blood issues with this vapour, as we know from red and running eyes, which infect the eyes of someone who looks at them (which would not happen if a vapour of corrupt blood did not issue with the ray). We can also discern this phenomenon in the case of a menstruating woman, who darkens and spots a mirror with her glance. Now, this bloody vapour, he says, issuing from the heart of the beloved and passing through the heart of the lover as if in its own residence and dwelling, wounds the heart and, finally coming to rest in the hardest part of it, returns to blood. This blood, because it is in some ways foreign to the place, contaminates all the rest with its poison. Two ill effects ensue: just as the gaze of a stinking old man and a woman in her time of the month invest the child, the gaze of a young person makes the old sick.3

The rich array of metaphors used by Comanini to describe the peculiarities of sight—blood, light, vapor, and spirit—deserves our attention. His evocation of vision as an activity with singular power is rare in the field of Renaissance art theory, which is usually profoundly un-doctrinaire and does not often quote philosophy. Do Comanini’s remarks reflect a theory of vision, held more widely among sixteenth- and seventeenth-century artists, extending to medicine and natural philosophy? We will examine several aspects consecutively, relating to these quotes about the “infective” powers of vision and its role in “passing through the heart”: the relation between vision and “fascination”; the role played by vision in the literature of love, and the understanding that looking at art involves a reciprocal “action at a distance.” As we shall see, philosophical theories on “extramission” and “intromission” are confounded in common descriptions of the experience of looking at art.

As there is no coherent body of artists’ discussions of these themes, we will cite from a variety of treatises, poems, emblems, and epigrams from southern and northern Europe—the main connecting thread between these texts being Ficino’s seminal writings, which are still quoted by the Dutch painter Samuel van Hoogstraten, one of Rembrandt’s pupils, in 1678.4

**Vision and fascination**

Comanini’s assertion that ocular rays “have a free and easy exit” through the eyes, which enables them to “infect” other persons and objects, actually takes a stand in a well-known debate, originating in ancient philosophy. It deals
with the direction of the rays that constitute vision: do they depart from the objects seen or from the eyes? The former opinion, preferring “intromission,” was held by Aristotle and by Arab philosophers such as Alhacen and Averroes, who describe seeing as the painful reception of tiny images sent out by the objects of vision, and as an intrusion of things upon the eye and mind. Plato and Galen instead state that the eye sends out rays. This theory of “extramission” gives the perceiver a particularly active role, as the visual rays strike the air with force and transform it, rendering it similar to themselves, so that the air becomes a sort of extension of the eye.\(^5\)

Not all art theorists are as definitive as Comanini in preferring the extramission hypothesis. In his *Della pittura* (1435), Leon Battista Alberti refers to the “philosophers” who write about “certain rays … by which the images of things impress themselves in our minds,” but he explicitly does not want to take a stand in the “great dispute” about the direction of these rays: “it suffices to imagine that the rays, like very subtle threads, are connected very directly” to the eye.\(^6\) Alberti agrees with Comanini, however, in supposing that “the rays between the eye and the seen surface … meet by their proper natures and by a certain amazingly subtle substance.”\(^7\)

This *mirabile sottigliezza* out of which the rays are formed, Comanini’s “vapor,” deserves closer scrutiny. The most elaborate theory about the fine spiritual substance that putatively pervades the universe and is radiated by every object is provided by Agrippa von Nettesheim, an author who was read by artists in Italy and the north.\(^8\) Borrowing from Ficino’s thought, he explains vision through a more general theory of invisible “ligations.” This concept, also translated as “binding” in the English edition of his writings, refers to what is known to historians of science as “action at a distance.” Agrippa’s *De occulta philosophia* (1531) develops the idea that all sensible things emit spirits according to their qualities, and they are likewise affected by spirits emanating from other things.

Agrippa describes not only sorcerers, certain magical animals, or plants, but also the planets, potions, weapons, and other objects that affect man without directly touching him, “binding” him with invisible “threads” that transfer their qualities. One example is the powers of magnetic stones; another is the melancholic spirits radiating from a shroud; likewise, someone who looks into a prostitute’s mirror will be infected with wantonness: “so great is the power of naturall things, that they not only work upon all things that are neer them, by their Vertue, but also … they infuse into them a like power.”\(^9\)

Most prone to inimical bindings are not only weak spirits such as those of children, but also the weakest parts of man’s body, which are the least corporeal and thus the most “spiritual”: the eyes. Just like the spirit leaves the body through the eyes, so spirits from outside find an easy entrance through this most “transparent” part of man. The sight of an object of beauty is especially dangerous, since raising the eyebrows in admiration facilitates the entrance of malignant spirits.\(^10\)

For the particularly strong kind of ligation incurred by vision, Agrippa deploys the term *fascinatio*.\(^11\) Calling the rays of vision the “vehicles of the
spirit,” he describes “fascination” as a tool for the *magus*, to be manipulated for good as well as bad effects: “the instrument of fascination is the spirit, viz., a certain, lucid, subtle vapour …. This tender spirit strikes the eyes of him that is bewitched … and possesseth the breast of him that is so stricken, wounds his heart, and infects his spirit …. So are strong ligationes made.”

In the sixteenth and seventeenth centuries, “fascination” gave rise to many ideas about the “evil eye” or about diseases that are transferred just by looking. A popular object of scholarly interest, it resulted in the genre of so-called “fascination literature”: examples are Juan Lázaro Gutiérrez’s *De fascinatio opusculum* (1643) and Johann Christian Fromann’s *Tractatus de fascinatione* (1674). These texts dwell on classical authors stressing on the one hand the dangers of looking at certain objects, like Ovid’s statement that “the eyes that regard the wounds of someone else, are wounded themselves; many bad things transfer their damaging properties from one body to another.” On the other hand, the gaze is described as an important tool to transfer one’s spirits to an object. Plutarch states that eye diseases are contagious because “so much active power has the gaze to transfer to another person the beginning of a contagion.” In the same vein, Agrippa writes: “In the vapours of the eyes there is so great a power, that they can bewitch and infect any that are neer them,” referring to “certain women in Scythia, amongst the Illyrians, and Triballi” who “killed whomsoever they looked angry upon.” The eleventh-century philosopher al-Ghazali’s description of the *magus*’ ocular qualities, enabling him to force a camel to go inside a bathhouse, was still attractive to Montaigne, who tells about a falconer summoning a bird to return to him, just by the power of his gaze. Theories about ocular “fascination” seem to have inspired love poetry when it compares the eyes to “magnets,” endowed with a particular force of attraction; it also attributes lethal powers to them.

Agrippa says that powerful ligationes may be made by “charmes, strong imaginations, and images.” Ultimately, his notion of sympathetic interaction between objects and human beings implies that all successful works of art effectuate “action at a distance.” This is in accordance to ancient authors who allot a “fascinating” power to statues; Ausonius speaks about a painted owl in the temple of Minerva on the Athenian Acropolis which, “shining with magical paint,” attracted birds that were then killed by a ray of lighting. A very authoritative example of an object that was supposed to have “beamed out” powerful spirits into the onlooker’s eyes is the Brazen Serpent held up by Moses which had a healing effect on the Israelites (2 Kings 18:4, Numbers 21:8). The implicit message this story contained about the importance of vision explains why it was a popular subject for clerics discussing the proper use of paintings as well as for artists, from Tintoretto (1575–76) to Rubens (1635–40) and Sébastien Bourdon (1653–54).

Within the scope of this chapter, we will focus on a central aspect of the artist’s trade: images of human beings. The assumption that visual rays transmit the qualities of the objects one looks at appears central to the common art-theoretical notion that images infuse “by their Vertue … a like power” in the spectator, who is overcome with hunger or drowsiness when looking at
paintings of respectively eating or sleeping figures, and feels in his own body the wounds of a depicted martyr.22

The intromission theory: The beholder's blood

The most common physiological effect associated with the “intromission” theory of vision is not confined to the realms of magic and medicine, but related to something profoundly human: love. This is exemplified by Comanini’s discussion of a “bloody vapor” issuing from the beloved, which, “passing through the heart of the lover …, wounds the heart and, finally coming to rest in the hardest part of it, returns to blood.” Upon receiving, through ocular rays, the beloved’s blood after it has been warmed and vaporized, the blood of the lover is “kindled” and “heated” in turn: Comanini speaks about the effect of lucide scintille, “shining sparks.”

In the context of the purported incendiary effect of vision, theories about love were of considerable importance to the visual arts. Painters may have known it directly from Ficino’s El libro dell’amore that, after its appearance in Italian in 1475, was reprinted thirty times until 1647; the sculptor Gian Lorenzo Bernini reportedly owned a copy.23 It is, however, more plausible that artists consulted emblem books based on Ficino’s ideas.24 Another source of transmission was Castiglione’s Libro del cortegiano (1528): its popularity is proven by painting treatises referring to it up to the seventeenth century, even in northern Europe.25

Using Ficinian terminology, Castiglione explains the “inflammation” of the blood caused by the sight of the object of one’s desire. In a discussion of what happens when the lover confronts his beloved, Castiglione describes the eyes as the entrance for spiritual rays from outside. When those rays mingle with the lover’s blood, they make him or her receptive to the beloved’s image. Then:

\[\text{vital spirits \ldots penetrate [through the eyes] naturally to the heart \ldots and, mingling with those other spirits dwelling there, and with the very subtle kind of blood which these have in them, they infect the blood near the heart \ldots and they make it like themselves, and ready to receive the impression of that image which they have brought with them.}\]26

The sight of the beloved ultimately leads to the “impression” of his or her image in the lover’s heart, the seat of the sanguine spirits.

Poems on paintings describe the literally warming effect attributed to the ocular reception of the image. The “burning” beauty of the beloved’s portrait is a returning trope in Giambattista Marino’s collection of epigrams, La galeria (1620). It describes one portrait in which the sitter emits “luminous rays,” of such power to send even Prometheus himself, who stole fire from the gods, to “the most burning sphere”; at another moment, the author asks of a portrayed woman, “are you painting, or fire?”, and wonders why the canvas itself is not bursting into flames.27 Bronzino’s portrait of a lady that “tames wild men” with its beauty must leave the heart “burning.”28
A Dutch imitator of Marino’s epigrams, Joost van den Vondel, praises a *Sleeping Venus* by one of Rembrandt’s pupils, Philips Koninck, observing that the painter has “kindled and lit the fire of art lovers, by means of living flesh, and not paint, that was artfully laid on the canvas.” Elsewhere, Vondel writes that a painted Venus sets everybody’s hearts on fire and needs no torches, arrows, bows, or other arms to warm their passions.

Apparently, paintings are talked about as if they effectuate the same “action at a distance” as real human beings. Another of Marino’s followers, the poet Giuseppe Battista, does not hesitate to write that he feels “an unfeigned burning for the feigned image.”

The extramission theory: Flames and arrows

The inflammation of the heart through the “shining sparks” carried by ocular rays is in accordance to the Aristotelian view that objects send out rays that are received by the eyes. As the quotation from Comanini shows, however, he prefers the “extramission” theory, just like a painter closely related to him: Gian Paolo Lomazzo. Lomazzo’s *Trattato della pittura* (1590) appears ultimately in favor of Plato, who “thinketh [vision] is caused from that brightnes, which proceedeth from the eye”; Lomazzo concludes that “the Beames of the sight … are those which going forth of the eye, doe apprehend all the particularities of the objects to be painted.”

Lomazzo’s formulation, that the eyes “beam forth” light, can be explained through the supposed relation between sight and blood, heated to the point of becoming inflammable, lucid vapor. As described in Plato’s dialogue *Timaeus*, the eyes were deemed infested with “so much of fire as would not burn, but gave a gentle light … to flow through the eyes in a stream smooth and dense.” This fiery character lies at the heart of a literary metaphor from antiquity, that the eyes of someone very passionate lance rays of lightning; it also explains Comanini’s idea that the emperor Tiberius could see in the dark. When the passions are cooled, the ocular light diminishes, according to a commonplace in epigrams: Marino, praising a painting by Giacopo Palma of Adonis falling asleep in Venus’ lap, mentions the “fire that slowly extinguishes between the heavy eyelids.” Shakespeare describes a tapestry of a battle scene where spirits are leaving the body of the slain and “dying eyes gleam’d forth their ashy lights.”

These lights may also be transferred to someone or something else. Early Modern “fascination literature” holds that looking at an object means infecting it with one’s spirit. Love poetry, rich in ocular symbolism, is explicit about the spiritual infection of the gaze. Artists were aware of this symbolism through emblem books and through Cesare Ripa’s popular iconographical handbook, *Iconologia* (1593). In an entry on “The Origin of Love,” Ripa discusses the ancient poet Musaeus as the first to explore love’s foundation in vision. In 1625, Zaratino Castellini made an addition to the Italian and Dutch editions of this entry, quoting from Ficino’s commentary on Plato’s *Symposium* that describes
in detail how spirits may beam forth from the eyes. When these spirits reach
their object, they may penetrate it through its weakest point, the eyes:

Just like this vapour from the blood, that we call the spirit ... is of the same
nature as the blood, it beams forth from the eyes as through glass windows, in
rays with the same quality as the blood[;] ... our body's heart, by an enduring
movement, thus affects the blood of anyone who is near, and from [the object's
eyes] it dilutes the spirits throughout the entire body, and through those same
spirits it sends out glowing sparks, permeating all parts of the body.

Castellini states that “the light of the spirit shines most strongly through the
eyes ... which have in them light, glow, vapours and sparks.” He compares
their powers to piercing arrows:

So it is no wonder that an open eye, which is directed at somebody with
great discernment, shoots its arrow-rays into the eyes of the one that looks at
it: when those rays penetrate the eyes of a confronting Lover they pierce his
heart ... thus hearts are wounded by the heart that shoots arrows.

This Ficinian theory of love, supposing “action at a distance” between lover and
beloved, gave rise to the popular metaphor comparing the beloved’s gaze with
a consummating fire. As Michelangelo writes: “From my beloved’s eyes there
issues and flies / a ray that burns with a light so bright / that through mine, even
when shut, it pierces my heart.” Shakespeare’s Venus and Adonis (1593), in which
eyes play a large role, states that “Thine eye darts forth the fire that burneth me.”
A popular emblem book by Otto Vaenius, Amorum emblemata (1608), explains
how, just as the food in a cooking pot is heated by external fire, the heart inside
the lover’s body is “consummated and annihilated / by the rays of his beloved,
that dart forth from her eyes.” This idea leads one poet to compare a beautiful
woman wearing glasses to Archimedes, who made fire using optical instruments:
the lenses before her eyes allow her to set everyone around her afame.

The “darting” movement of ocular rays inspired another trope: gazes are
described as arrows. This happens frequently in love poetry; Du Bellay’s Jeux
rustiques (1558) writes about “Vos yeux archers, auteurs de mille morts.”
Another of Vaenius’ emblems depicts how the lover is hit in the chest by rays
darting from the eyes of the object of his love. The rays are visualized literally
as four sizeable arrows: one has already pierced the lover’s heart, two more
are just leaving the eyes. This notion of ocular assault inspires the idea that
by impeding a creature’s sight, one immediately takes its power away. Pliny
describes how a lion can be caught by throwing something over its head,
because “all his power is concentrated in his eyes”; the anecdote returns in
Jacob Cats’s emblem book of 1627, which contains an image of an apparently
tame lion, its eyes covered by a veil.

The qualities of the beloved’s gaze are mentioned frequently in descriptions
of works of art, which ascribe the power of ocular “fascination” to depictions
of beautiful people. The Anthologia Graeca tells of an Eros by Praxiteles
whose “eyes lance charms, not with his arrows, but only with his gaze.”
An argument in the *paragone* championing painting above sculpture is the former’s ability to represent the “gracious sight of black and blue eyes, with the splendour of those amorous rays (raggi amorosi),” as Castiglione states. In Lodovico Dolce’s *Dialogo della pittura* (1557), Titian’s painting is presented as equally evocative as Ariosto’s verses on the enchantress Alcina: she has “Two brown eyes, or even two clear Suns … around them, it seems that Amor plays and flies; / from them he discharges his entire quiver.” The wish to avoid the arrows from Venus’ eyes explains why Cupid is often depicted with a blindfold. This topos is also visualized in images of the love goddess accompanied by Cupid aiming his dart: in Werner van den Valckert’s painting (1612–14), Venus looks straight at the viewer; comparable works were made by Alessandro Turchi (c. 1620) and Guercino (1633).

Another popular commonplace states that the painted figure does *not* look at the beholder, because if she would (usually it is a she), her seductive powers would be too great. According to Pausanias, the statue of *Aphrodite Morphe*, which wore chains about its feet to impede it from walking, was blindfolded as well to prevent too great a power over the beholders. A seventeenth-century epigram on a sleeping nymph painted by Jacob Backer, one of Rembrandt’s rivals in Amsterdam, states that “she is already burning us [by her beauty] while she is asleep; when she wakes, she will turn us entirely to ashes: because the eye sets fire to the heart.” In 1682, art theorist Willem Goeree tells that a painting of a sleeping Venus bore the inscription that the goddess should not be awoken, lest her gaze seduce the beholder to remain forever in the virtual reality evoked by the artist. He concludes “that there is a Charming Power which beams forth from the eyes,” a power which when it reaches its object is “as it were drunk in through the Eyes; and when it creeps in through those open Windows, penetrates to our Heart’s core.”

### Pupils and pictures

When epigrams and love poems discuss the dangers involved in seeing, they also borrow from the intromission theory. Their metaphors are based on the seventeenth-century notion that vision involves a tiny replica of the object seen; after entering the viewer’s eye, it leaves its imprint in the imagination:

> as our [Aristotelian] Philosophers commonly suppose, the soul, in sense experience, has to contemplate images that are sent from objects into the brain …; seeing that our mind can easily be stimulated by a painting to receive the object that is painted on it, they believed that our mind is in the same way stimulated to comprehend the objects of sense experience by means of minute images which are formed in our head.

The assumption that objects emit tiny spiritual “images,” or *effigies tenues* replicating them, led to the imaginative etymology that related *pupilla* (pupil) to “little puppet”: the eyes putatively contain small *homunculi* that, through the act of looking, enter someone else’s eyes in order to start their malefic workings.
The tiny figures can be discerned easily through looking someone closely in the eye. This idea seems to be relevant when Shakespeare’s longing Venus asks Adonis: “look in mine eye-balls, there thy beauty lies.” A contrary effect is described in John Donne’s poem “Witchcraft by a picture”: the poet describes how his beloved keeps his effigy, his pupilla, captured in her eye in constant torment: “I fix my eye on thine, and there / pity my picture burning in thine eye.”

In the context of the visual arts, the “ill effects” mentioned by Comanini, when ocular rays “contaminate” the object of sight with their “poison,” are explained when dealing with the iconography of Medusa. Ideas about this mythical figure, most famously painted by Caravaggio (c. 1597), suggest that ocular rays are not only seductive, but also have truly malefic effects. If Caravaggio’s image, painted on a shield-like shape, was intended to hang above a doorway or in another elevated position, it would have looked down menacingly on the spectator.

Descriptions of Medusa relate how her eyes are, not unlike the lover’s, “burning” with ocular sparks. As Marino explains, however, her gaze reverses the artistic power to “inflame” the viewer: she draws the “blood” and “spirit” from the object of her sight. Various epigrams on Benvenuto Cellini’s sculpture of Perseus (1554), brandishing Medusa’s head, state that the spectators were “stoned” by her gaze as they gaped in numb amazement at such a lifelike work of art. Marino likewise describes how “all who turn their eyes” to an ancient sculpture of Medusa “are stoned with stupor.”

Apparently because of its effect to “strike the spectator with horror,” a Medusa painted by Rubens around 1617 is reported to have been kept behind a curtain, only to be revealed at specific moments. For the same reasons, perhaps, Cardinal Del Monte gave Caravaggio’s painting of Medusa to the Archduke of Tuscany; Marino described the gift of this painting in terms of a transfer of Medusa’s powers.

Less explicit, but more frequent descriptions of the fatal power of ocular rays, comparable to the maleficient workings of the “evil eye,” relate to Biblical stories of “dangerous women” who seduce men through their beautiful appearance. They are often depicted while they display parts of their body and broodingly stare the spectator into the eye, immediately before or after committing a violent act. Examples are Judith with the Head of Holofernes as painted by Cristofano Allori (1613) and Rubens (c. 1617), or Salome by Sebastiano del Piombo (1510), Titian (1515, Figure 16), Caravaggio (1609), and Jacob Hogers (c. 1630–55). In an epigram on Luca Cangiari’s painting of Herodias with the Head of John the Baptist, Marino directly compares the “cruel and beautiful” woman to Medusa. The pictorial tradition is in keeping with texts stressing the ocular powers of these Old Testament women. In 1627, Cats, the poet quoted earlier, wrote that Judith, using the “stratagem” of her eyes, seduced first the Assyrian guards and then their leader, Holofernes: “The moment he looked, he died.” It seems that the same fatal ocular seduction is at stake in images of David with the Head of Goliath in which a semi-naked David looks straight at the viewer.
We have seen that in sixteenth- and seventeenth-century ideas about ocular rays, as discussed in the context of the visual arts, the Platonic and Aristotelian positions merge. The eyes are deemed to be the weakest part of man, prone to inimical “ligations,” but they are also allotted the power to transmit one's

16 Titian, *Salome*, c. 1515, oil on canvas, 89 × 73 cm, Rome, Galleria Doria Pamphili, Fototeca Nazionale

**Incorporating the image**

We have seen that in sixteenth- and seventeenth-century ideas about ocular rays, as discussed in the context of the visual arts, the Platonic and Aristotelian positions merge. The eyes are deemed to be the weakest part of man, prone to inimical “ligations,” but they are also allotted the power to transmit one’s
spiritual qualities to others. Comanini’s observation that a “spiritual vapour issues with the [ocular] rays,” so that eyes “infect the eyes of someone who looks at them,” implies that the visual interaction between the seer and the seen is reciprocal. One art historian describes the effect attributed to portraits of beautiful people as “ocular love-making,” a terminology that reflects how love lyric speaks about “eyes that embrace” or “kiss” each other. As the parallels between the early modern “art of love” and the visual arts suggest, the aesthetical experience may also involve a two-way transfer of qualities.

Castiglione’s ideas are revealing in this context, stating that only the movement of the gaze from the eyes to the object of their love, and from object to eye, results in the creation of a mental image. He argues that the beloved’s image, after its entrance through the eyes, is physically incorporated in the lover’s body. Then a mixture of spirits from two directions takes place: “Because the spirits meet in that sweet encounter, each takes on the other’s qualities.” The act of loving is thus similar to the act of painting, when the artist makes an image that is partly inspired by his model and partly the product of his imagination. Only when the model’s image is fully internalized, when it becomes part of the painter’s body, it acquires the necessary presence that enables the painter to turn it into a work of art. In this context, love poetry compares the heart to a reflecting surface or states that Amor has painted the beloved’s likeness on the lover’s heart. Shakespeare is even more explicit in describing the lover himself as a painter who encapsulates the image of his beloved within the frame of his own body.

Shakespeare’s remark echoes one of Michelangelo’s sonnets, in which the sculptor laments that:

You entered me through my eyes …
as a cluster of unripe fruit goes into a bottle,
and, once past the neck, grows where it is wider;
so does your image
grow once it’s inside the eyes, so that I stretch
like a skin inside of which the pulp is swelling.

The poem ends: “having entered me by such a narrow route, I can hardly dare to believe you’ll ever get out.” Ultimately, this literal incorporation of the image may lead to the artist’s transformation into the object of his sight: then everything he makes, instead of showing the traces of his own hand, takes on the likeness of his beloved. As Vondel writes about one of Rembrandt’s pupils, Govaert Flinck:

Everything Flinck draws or paints
on canvases and panels, looks like
Sofie, his beloved,
who lives in all his veins.

The constitution of the beloved’s image, although it is inspired by seeing the other person, requires an act perpetrated by the lover himself; in painting,
analogously, the viewer’s gaze that emits his or her diluted blood is indispensable to render the depicted figures their bodily “heat” and “blood,” their lifelikeness. The two-way movement of ocular exchange means that while the beholder’s senses are taken over by the painter’s illusionistic skills, the art object itself changes too, from a lifeless material object into an animate reality. Thus Shakespeare’s troubled heroine in The Rape of Lucrece (1594), contemplating a wall painting of figures in mortal agony, “lends them words, and she their looks doth borrow”: on the one hand Lucrece’s imagination infuses the painting with life, on the other hand she is physically influenced by the depicted passions.80

This reciprocal character is expressed more fully in the recommendation, very common in epigrams, that painted figures should entice the beholder into starting a conversation, that is to say, taking part of an illusion in which the artwork makes place for an alternative reality appealing to other senses than sight alone.81 Marino’s descriptions of portraits, like those by Ambrogio Figino—the protagonist of Comanini’s dialogue—reveal how successful this illusion may be; the poet mistakes a painted image for the real one time and again; only when he “grasps the shadow” and his lips “kiss the canvas,” he finds out that his sight has deceived his other senses, so that he finds “real anguish in fake colour.”82

The theory that explains vision as a reciprocal “taking over of qualities” is close to Agrippa’s idea that all objects, by means of a spiritual transmission, infuse their surroundings with “a like power.”83 Donne stresses the reciprocal character of sight when he speaks about a “negotiation” between the gazes of lover and beloved.84 Art theory supposes a similar negotiation between painter and spectator: when the mixture of spirits from viewer and artwork takes place, the viewer effectively partakes of some of the painter’s original qualities, those qualities that were expressed in his effort at persuasive representation of living figures. Thus, just by looking at art one may be transformed into a painter.85 Van Hoogstraten’s treatise of 1678 suggests that the beholders of the nymph Galatea, painted by Raphael, experience the same love that Raphael felt for his model, and concludes: “what seems to be impossible can be achieved by love, since the spirits are most active when the senses are in love.”86

The diverse connotations to vision as a two-way “action at a distance” may have all been visualized in Bronzino’s painting of Pygmalion and Galatea (1529–39), now in the Uffizi (Figure 17). This is probably the work described in Giorgio Vasari’s Vite (1568) as “Pygmalion praying to Venus in order that his statue, receiving the spirit, becomes alive and made of … flesh and bones.”87 The image shows Pygmalion’s statue that has just come to life, since his offering to the love goddess is burning in the background, while the artist kneels in front of his as yet unclad beloved, who stares out of the painting at the viewer.

Vasari remarks that spirito was necessary to the sculptor’s Promethean wish to change, with divine help, lifeless stone into flesh. His term, as part of a theory of art, may be interpreted in various ways. An animal is sacrificed; perhaps its vital spirits may be transferred to Galatea through Venus’ intervention.
But Pygmalion’s own spirits are kindled too when looking at the statue, possibly in a replication of the flames consuming his offering; Vasari echoes Ovid, who describes how “a fire ignites in his breast for the simulated body.”

Most importantly, however, Galatea’s gaze at the viewer, instead of at her creator, seems to imply that the painter alludes to the relationship between art object and beholder. Bronzino was well acquainted with theories about spirits transmitted by ocular rays, as is proven by one of his poems which satirically compares the beloved to an onion, of which the “vapors” enter the eyes to malefic effect.

Bronzino’s image illustrates the notion that, on the one hand, the work of art exerts “fascinating” power over the viewer and may directly invite him or her to take part in an alternative reality, as is exemplified in the living statue’s direct appeal at the viewer. On the other hand, the art lover’s heated
spirit is indispensable to virtually change marble into flesh. The image hence corroborates the conclusion that notions of vision, as developed in the context of sixteenth- and seventeenth-century painting, involve extramission as well as intromission theories in order to describe the experience of art as a two-way transfer or “action at a distance.”

A poem in which Marino reflects on Pygmalion’s powers demonstrates the reciprocal nature of artistic experience: it may be the cause of an ultimate cross-over of qualities, when a beholder’s admiration for a statue has rendered him immobile, while the statue has become a living being. “Each takes on the other’s qualities,” as Castiglione writes: while the beholder yields the control over his senses to the work’s illusionistic properties, the art object itself is transformed too, from a lifeless material object into an animate and moving reality.

Notes


3 “Dal sangue nascono gli spiriti; e però tali sono gli spiriti, qual è [il] sangue donde si creano: onde nella gioventù gli spiriti sono sottili, chiari, caldi e dolci. Da questi spiriti sono prodotti certi raggii, di qualità simili a quelle de’ medesimi spiriti producenti; i quali raggi spuntano per gli occhi, quasi per due finestre di vetro: poiché queste lucide scintille, per esser leggiere, volano dalle inferiori mebra alle più alte parti del corpo, e quivi ritrovando gli occhi, che son trasparenti e puri, hanno facile e libera uscita. Di questi raggi fanno fede quegli animali, i cui occhi risplendono nelle tenebre della notte, e quei circoli i quali pare che ciascun vegga, quando si stropiccia gli angoli degli occhi col dito; olt’re quello che di Tiberio si legge, cioè che, quando la notte si risvegliava, vedeva per qualche spazio di tempo senza altro lume, che con quel solo degli occhi. Dice di più, che con questi raggi esce un vapore spirituale, e con questo vapore esce sangue; come si conosce dagli occhi lippì e rosseggiànti, i quali ammorbano della medesima infermità gli occhi di chi li rimira (la qual cosa non avrebbe, se col raggio non uscisse un vapore di sange corrotto), e come ancora si può discernere dalla femina menstruata, che con gli sguardi oscura e macchia lo specchio. Ora, questo vapore sanguigno, dice egli, partendo dal
cuore di chi nell’amor percote e passando al cuore dell’uom percosso come a suo proprio seggio et albergo, ferisce il cuore e, rintuzzandosi nella più dura parte di quello, ritorna in sangue. Il qual sangue, per essere in un certo modo pellegrino nell’impiagato, corrompe tutto il rimanente col suo veneno. Quinci nascono due malie: perché lo sguardo d’un puzzolente vecchio e d’una donna che patisca i flussi lunari infetta il fanciullo, quello d’un giovane ammalia il vecchio”;


4 Samuel van Hoogstraten, *Inleyding tot de hooge schoole der schilderkonst* (Rotterdam: 1678), 5.


6 “[C]erti raggi … per essi i simulacri de le cose s’imprimono nel senso. … A noi basti, che s’imaginiamo, che i raggi a modo d’alcune fila sottilissime, siano drittissimamente legati”; Leon Battista Alberti, *La pittura di Leon Battista Alberti*, trans. Lodovico Domenichi (Venice: Gabriel Giolito de Ferrari, 1547), 6r–6v.

7 “[I] raggi istessi tra l’occhio, e la superficie veduta, intenti per propria natura, e per una certa mirabile sottigliezza, benissimo convengono”; Alberti, *La pittura*, 6v.


10 This is argued, for instance, by Campanella; cf. Siegfried Seligmann, *Die Zauberkraft des Auges* (Hamburg: Friederichsen, 1922), 461.


13 Both books are discussed in Hermida, *Cuatro tratados médicos*.

14 “Dum spectant oculi laesos, laeduntur et ipsi/multaque corporibus transitione nocent”; Ovid, *Remedia amoris*, 615.

15 Plutarch, *Symposion* V, VII.331.


18 Cf. Francesco Melosio’s poem “Occhi neri laudati” (1609–70), which calls brown eyes “d’ogni alma e d’ogni cor le calamite”; in Giovanni Getto, ed., *Opere scelte*


20 “[H]ic clari viguere Menecratis artes / atque Ephesi spectata manus vel in arce Minervae / Ictinus, magico cui noetua perlita fuco / allicit omne genus volucres perimitque tuendo”; Ausonius, Mosella, 310.

21 Cf. David Freedberg, Iconoclasm and Painting in the Revolt of the Netherlands, 1566–1609 (New York and London: Garland, 1988), 62. Examples of paintings of The Brazen Serpent include those by Giacopo Tintoretto (1575–76), oil on canvas, 840 × 520 cm, Venice, Scuola Grande di San Rocco; Hans Speckaert (date unknown), oil on canvas, 159 × 239 cm, Buenos Aires, Museo Nacional de Bellas Artes; Peter Paul Rubens (1635–40), oil on canvas, 186 × 265 cm, London, National Gallery; Anthony van Dyck (1618–20), oil on canvas, 205 × 235 cm, Madrid, Museo del Prado, and Sébastien Bourdon (1653–54), oil on canvas, 105 × 89 cm, Madrid, Museo del Prado. Rubens’s image in particular was copied many times in painting and engraving.

22 “[A] picture artificially expressing the true naturall motions, will (surely) procure laughter when it laugheth … cause the beholder to wonder, when it wondereth, … to have an appetite when he seeth it eating of dainties; to fal a sleepe at the sight of a sweete-sleeping picture”; Gian Paolo Lomazzo, A Tracte Containing the Artes of Curious Paintinge Caruinge and Buildinge … Englished by R[ichard] H[aydocke] (Oxford, 1598), II, 1, 1–2, cf. Carolus Scribanius on a Saint Sebastian by Coxcie: “et spectatores vulneris dolorem sentiunt”; Carolus Scribanius, Antverperia (Antwerp, 1610), 39.


24 One example of this kind of transmission is the 1644 edition of Ripa’s Iconologia, incorporating material from Ficino’s De amore, that the painter Samuel van Hoogstraten advised as a sourcebook for artists in his Inleyding, 92, 111, 223.

25 It was translated into Dutch partly in 1639 and entirely in 1662 and 1675; for direct references, see Karel van Mander, “Den grondt der edel-vry schilderconst,” in Het schilderboeck (Haarlem, 1604), IV, 37, f. 14v, and Franciscus Junius, Schilderkonst der oude (Middelburg, 1641), introduction, vi.

26 “[V]ivi spiriti … entrando anchor negli occhi … naturalmente penetrano al core … e ivi si confondono con quegli altri spiriti, e con quella sottilissima natura di sangue, che hanno seco: infettano il sangue vicino al core, … e fannolo à se simile, e atto à ricevere la impression of quella imagine, che seco hanno portata”; Baldasare Castiglione, Il libro del cortegiano del Conte Baldesar Castiglione (Venice: Aldo Romano and Andrea d’Asola, 1528), III, 180.


28 Ibid., 239.

“[O]m door zulk een middel ‘t vier / des kunstbeminners meer t’ontvonken en ontsteeken / door levend vleesch, geen verf, met kunst op doek gestreken”; ibid., 946.

Ibid., 947.


Ibid., V, 5, 195.


“Trà le gravi palpebre à poco à poco / sepelisce il tuo foco”; Marino, *La galeria*, I, 12.


In the translation of D. Pietersz Pers: “gelijckerwijs dese damp van ‘t bloed, die wy den geest noemen ... soodanigh is, als t’bloed is, soo schiet het oock door de oogen, als door de glaese vensteren, gelijcke straelen die ‘t bloed gelijck zijn ... En also beroert oock ‘t herte van onse lichaem, door een gestaedige beweginge, het bloed, van die daer nae by is, en van daer spreyt het de geesten door ‘t gantsche lichaem, en door dieselve geesten verspreyt het de glinsterende voncken, door alle de leeden, ...‘t licht van den geest ginstert aldermeest door de oogen ..., in sich hebbende licht, glants, dampen en vievonenck ... Soo is’t dan geen wonder, dat een open oogh, met groot opmercken op iemant gestiert, de pijlen van zijne straelen schiet in de oogen, van die ‘t oogh beschout: welcke straelen door de oogen van haere tegen-Minnaers schietende, dringen door tot in’t herte toe van dese ellendige Minnaers: ... zy zijn gewont van ‘t herte, dat de pijlen werpt”; Ripa, *Iconologia of Uijtbeeldinghen des Verstants*, 384. Castellini’s addition was first made in 1613.


Venus and Adonis, line 196.


“Questo far non pò gia il marmoraro, né meno esprimer la graziosa vista degli occhi neri e azzurri, col splender di que’ raggi amorosi”; Castiglione, *Il libro del cortegiano del Conte Baldesar Castiglione*, 126.

“Qui l’Ariosto colorisce, e in questo suo colorire dimostra essere un Titiano … Son duo negr’occhi, anzi duo chiari Soli, / … / intorno a cui par, ch’Amor scherzi e voli, / e ch’indì tutta la Faretra scharchi”; Lodovico Dolce, *Dialogo della pittura … intitolato l’Aretino* (Venice, 1557), f. 30r.


Werner van den Valckert, *Venus and Cupid* (c. 1612–14), oil on panel, 103 × 77 cm, USA, private collection; Alessandro Turchi, *Allegory of the Power of Love* (c. 1620), oil on canvas, 100 × 123 cm, Apeldoorn, Rijksmuseum Paleis Het Loo (on loan from The Hague, Mauritshuis); Guercino, *Venus, Mars, and Cupid* (1633), pen and brown ink over black chalk on laid paper, Washington, National Gallery of Art. Cf. Sluijter, “‘Les regards dards,’” and by the same author, *Rembrandt and the Female Nude* (Amsterdam: Amsterdam University Press, 2006), 153–6, 382.


“[Z]y brandt ons nu zy slaapt; indien zy wakker wordt, / zoo maakt z’ons heel tot asch: want ‘t oog ontsteekt het hart”; Jan Vos, *Alle de gedichten* (Amsterdam, 1726), I, 336.


“[D]at men niet onderstelt dat de ziel, om te gevoelen, enige beelden behoef te beschouwen, die door de voorwerpen tot in de harssenen gezonden worden,
gelijk onze Wijsbegerigen gemenelijck doen ... [die], ziende dat onze geest lichthijk door een schildery opgewekt kan worden, om't voorwerp, dat'er op geschildert is, t'ontvangen, gemeen hebben dat onze geest op gelijke wijze moest opgewekt worden, om de dingen te bevatten, die door enige kleine beeldjes, de welken in ons hoop gevormt wierden, onze zinnen treffen”; René Descartes, “Verregezichtkunde,” in Proeven der wysbegeerte; of redenering van de middel om de reden wel te beleiden, en de waarheit in de wetenschappen te zoeken (Amsterdam, 1659), 81–2. This Dutch edition of Descartes’s optical theory was owned by painters like Van Hoogstraten; cf. Michiel Roscam Abbing, De schilder en schrijver Samuel van Hoogstraten 1627–1678: eigentijdse bronnen en oeuvre van gesigneerde schilderijen (Leiden: Primavera Press, 1993), no. 122, 76; see references to Descartes in Van Hoogstraten, Inleyding, 304, 325.

59 “[E]ffigies quoque debent mittere tenues res quaeque”; Lucrece, De rerum natura IV.82, cf. 95, 103, 151.

60 Deonna, Le Symbolisme de l’œil, 30–34; Seligmann, Die Zauberkraft des Auges, 249.

61 Venus and Adonis, line 119.


63 Caravaggio, Medusa (c. 1597), oil on canvas mounted on wood, 60 × 55 cm, Florence, Uffizi.

64 “[O]cchi infiammati,” Vincenzo Cartari, Le imagini ... de i Dei (Venice, 1556), LXXIXr; “Lumina Gorgoneo saevius igne micant,” Ovid, Ars amatoria III.503; cf. “ses yeux étincellent d’un feu plus ardent que celui de yeux de la Gorgone,” Montaigne, Essais, vol. II, ch. XXXI.


68 Rubens, Medusa (1617–18), oil on canvas, 69 × 118 cm, Vienna, Kunsthistorisches Museum; “[S]ubito terrore perculsum spectatorem (velari nempe tabella solet),” Constantijn Huygens, Fragment eener autobiografie, ed. Jacob Adolf Worp (s.l.: s.a.), 73.


70 Cristofano Allori, Judith (1613), oil on canvas, 120 × 100 cm, Windsor, Royal Collection; Rubens, Judith (c. 1617), oil on wood, 120 × 111 cm, Braunschweig, Herzog Anton-Ulrich Museum; Simon Vouet, Judith (c. 1620), 97 × 73 cm, Munich, Bayerische Staatsgemäldesammlungen, Alte Pinakothek; Sebastiano del Piombo, Salome (c. 1510), oil on wood, 55 × 45 cm, London, National Gallery; Caravaggio, Salome (c. 1609), oil on canvas, 116 × 140 cm, Madrid, Palacio Real; Jacob Hogers, Salome (c. 1630–55), oil on canvas, 176 × 133 cm, Amsterdam, Rijksmuseum. It is not hard to find more examples; a theme that was treated the same way is Jael and Sisera.


72 “Eodem stratagemate Luditha primo vigiles, mox Imperatorem ipsum Assyriorum Holofernem circumvenit. Ut vidit, ut perii usque adeo”; Cats, Sinne- en Minnebeelden, X.b.5.
Cf. Giuseppe Vermiglio, *David with the Head of Goliath*, oil on canvas, 130 × 101 cm, Koelliker Collection, Milan. Art historians have often remarked that in Caravaggio’s depiction of this scene, Goliath is a self-portrait: this would make David the cruel beloved, cf. Christoph Luitpold Frommel, “Caravaggio und seine Modelle,” *Castrum Peregrini* 96 (1971), 21–56. In the case of the beheaded figure, as in the case of the perpetrator, painters were apparently fond of using self-portraits; Lavinia Fontana and Artemisia Gentileschi seem to have painted themselves as Judith, and Titian may have used his own head for that of John the Baptist; cf. John Shearman, “Cristofano Allori’s ‘Judith,’” *The Burlington Magazine* 121:910 (1979), 10.


Giacomo d’Aquino’s poem “Cor stillato in specchio” (1638) states that “la tua figura / era una e sola nel mio core intiero”; Baldassare Pisani’s (1650–?) poem “A bella donna che si specchia” has this line: “il mio core / ove di proppria man le tue fattezze / ha con punta di stral dipinto amore”; see Getto, *Opere scelte di Giovan Battista Marino e dei marinistì*, 390.

“Mine eye hath played the painter and hath stelled / thy beauty’s form in table of my heart, / my body is the frame wherein ‘tis held”; Shakespeare, Sonnet 24.

“Tu m’entrasti per gli occhi … / come grappol d’agresto in un’ampolla, / che doppo’l collo cresce ov’è più largo; / così l’immagin tua … /entro per gli occhi cresce, ond’io m’allargo / come pelle ove gonfia la midolla; / entrando in me per si stretto viaggio, / che tu mai n’esca ardir creder non aggio”; Saslow, *The Poetry of Michelangelo*, 54 r. 73–80, cf. Van den Doel, *Ficino en het voorstellingsvermogen*, 216.

“The Rape of Lucrece*, I, 1498.


Polidoro was putatively “door’t zien schilderen in een Schilder verandert”; Van Hoogstraten, *Inleyding*, 10.

In Palazzo Chigi, “wrocht Urbijn, toen hy verliet was; Venus deede hem Venus op het schoonst ten toon brengen … Het geen onmooglijk schijnt kan de liefde
uitvoeren, want de geesten zijn wakkerst in verliefde zinnen”; Van Hoogstraten, Inleyding, 291.


90 “[S]ì di senso lo stupor mi priva, / ch’io son quasi la statua, ela par viva”; Marino, La galeria, I, 294.
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“All in him selfe as in a glass he sees”:
Mirrors and vision in the Renaissance

Faye Tudor

And thou my Soule, which turnst thy Curious eye
To view the beames of thine owne forme divine,
Know that thou canst know nothing perfectly,
While thou art Clouded with this flesh of mine.

Sir John Davies, Nosce Teipsum, lines 1913–16

Introduction

During the Renaissance, mirror-manufacturing technologies underwent a rapid series of changes and advances as a result of certain new discoveries. The progression from small, dark, concave mirrors to flat looking-glasses of a larger size and improved clarity offered early modern artists and writers new opportunities for metaphor and painterly techniques, as well as innovative methods to portray the subject. This paper will analyze the role of the mirror in the context of literature and art, and seeks to show the impact of this technology in these fields. I will focus on the implications of the mirror for ideas of vision in the seventeenth century in Johannes Gumpp’s Self-Portrait (1646). Then, through a discussion of Nosce Teipsum (1599) by Sir John Davies, I explore these themes in relation to the replication of the self, and the formation of what might be termed “self-reflexiveness.”

Vision, identity, and mirrors have been associated with one another since classical times. The tale of Narcissus, for example, the story of the beautiful young man who unwittingly falls in love with his reflection and subsequently perishes at his moment of self-recognition, is one that portrays the clarity and beauty offered by the “mirror” and the ease with which eyes can be deceived. Narcissus finds his “self,” his interior is exposed to him through the medium of the mirror. The “mirror” offers a “true” image, even if sight is fooled. Addressing this problem of locating and perceiving the “self” in myth, Edward P. Nolan suggests that “in each mythic configuration, the encounter of each figure with the desired Other involves the problem of partial knowledge and
significant failure.” In placing the themes of self-love and identity within a framework of failure, loss, and individuation, the Narcissus myth underlines the part played by visual trickery and optical deception in tracing and finding identity in the Renaissance.

**Mirror technology**

The first mirror would have been a pool of water which, when perfectly still, provided a reflection. Alternative methods of viewing the face before metal or glass looking-glasses include materials such as obsidian, a black volcanic stone which, when highly polished, gives off a dark reflection. The earliest such mirrors were found to date from around 6200 BCE. Other mirrors which pre-date glass include bronze, copper, silver, and gold mirrors found in Egypt, Persia, and Northern Italy. However popular these metal mirrors were, production eventually turned towards glass: the earliest glass mirrors date back to no later than the third century AD and are extremely small (their diameter is often less than 7.5 cm). A central problem in the production of glass mirrors was the lack of clarity in the glass—so dull was its texture, glass was originally considered as an alternative material to pottery. Glass was first made by casting and grinding, rather than by glass blowing, and this technique resulted in an opaque material.

In his important work *The Mutable Glass: Mirror-imagery in Titles and Texts of the Middle Ages and English Renaissance* (1982), Herbert Grabes notes the “developments which had taken place at the cultural and technological level” in mirror-making. It was during the sixteenth century “that the Venetians solved the technical problems which had ... stood in the way of large-scale manufacture of glass mirrors.” By the early 1600s, these developments had reached England. This expansion of the progress being made in the manufacture of mirrors coincides with the burgeoning understanding of their science and technology.

A glimpse at the history of optics and catoptrics (the science of reflection) during the period in which Gumpp and Davies worked reveals the extent of the advances in this field in the sixteenth and early seventeenth centuries. In 1558, Giambattista della Porta published his *Magia Naturalis*, which discussed optics, the camera obscura, and the use of convex and concave lenses, while in the same year John Dee published *Propaedeumata Aphoristica*, which was intended as a scientific introduction to the topics of astrology and astronomy. In the fields of optics and catoptrics, Johannes Kepler published a correct explanation of how spectacles work (1604), and Hans Lippershey invented a primitive telescope (1609) which Galileo used to survey the night sky (1610). In addition, Dutch mathematician Willibrord Snellius discovered the law of refraction, later called Snell’s Law, but first published by Descartes in 1637, which accounted for the passage of light between two media (for example, air and glass), and in 1662 Pierre de Fermat uncovered the “principle of least
time,” which states that a ray takes the shortest route between two points. It is difficult to quantify how these developments may have had a wider effect on early modern society, but certainly Elizabeth Spiller has suggested that the impact of Galileo’s discoveries, as recorded in *The Starry Messenger (Sidereus Nuncius, 1610)*, was such that readers were required to adopt not only new ways of seeing, but a new way of reading texts.\(^1\) Equally, while the telescope evolved out of pre-existing lens technologies, each development brought with it a new sense of wonder and new opportunities for sight and seeing.\(^2\)

But the problem with the new, clearer looking-glass was that where the mirror had previously “served as a figure of God’s divine creation,” technological developments allowed “any bourgeois citizen … [to] … produce in an instant … a counterfeit image of crystal clarity.”\(^3\) While early mirrors of stone and metal barely produced a useful reflection and thus posed no threat, the newer mirrors allowed the individual to “make” an image of his or her self. Stuart Clark traces the fluctuations of religious opinion on images and vision, and reveals a complex flow of ideas, finding that “late medieval piety invested heavily in the sense of sight supported by the visual theories that gave eye-contact with objects of devotion a virtually tactile quality.”\(^4\) This notion of visual rays physically interacting with idols and objects was challenged and considered blasphemous as “pre-Reformation and Protestant critics of the Church” sought to replace “eye-service with ear-service.”\(^5\) Such ideas were subject to constant change and review from both within the Church and outside it. Leonardo da Vinci, for example, privileges sight over hearing, arguing that “the eye deludes itself less than any of the other senses, because it sees by none other than the straight lines that compose a pyramid.”\(^6\) At the core of such discussions, whether in art or religion, is the sense of “truth”—in each discipline, we find a search for that which will bear the most truth, be it eyes, ears, or mirror.

The mirror was an object in flux, its uses and applications oscillating between the austere and dedicated application of the devout to the practical, imaginary, and scientific tools we will find in Sir Thomas Elyot’s *Dictionary* (1538). Its utilitarian applications were not lost on other writers of the period. Working in Venice on medicine, mathematics, and alchemy, Ettore Ausonio writes around 1560 of the many uses of concave mirrors, including their use in the sun to burn and/or cook food as well as the potential to create images of different sizes or even the ability to generate sound among some of the purposes of the concave glass.\(^7\) Thus the mirror was not simply the passive recipient of objects placed before it. Rather, it was also a manipulable tool of the scientist and the technologies whose practical applications were far-reaching in their scope and potential.

Spiller sees science and knowledge, and reading and literature as inextricably intertwined, arguing that “early modern natural philosophy and science is understood by its own practitioners … as a form of making.”\(^8\) This notion of science as “making” is of particular importance in the case of the mirror, given its place in discourses of religion, of the formation of
the self, of shame, of self-love, and of vanity. Mirrors of increasing size and clarity offered the individual greater opportunity to contemplate his or her self, a moment which could easily be construed in certain circumstances as undesirable behavior. Equally, the invention of crystal glass mirrors, which quickly eclipsed the murky steel mirrors and distorting convex glasses, led to the belief that “the clarity of the reflection seems to have been perceived by some as a usurpation of divine vision.”

Mirror language

The term “mirror” has its roots in Latin, originating from the word *mirari*, which means “to wonder, admire, whence miracle.” The definitions and translations of Sir Thomas Elyot (c. 1490–1546) record a sense of fascination or amazement with the object that is the mirror. Elyot, who had interests in science and medicine, published his medical treatise *A Castell of Health* in 1536, and followed it with his popular Latin–English *Dictionary* (1538), which translates “miror, -aris, -ari” as “to meruayle” (to marvel). Perhaps more intriguing and revealing in Elyot’s “dictionary” is the list of words that unveils the technologies available: for example, “speculum” is defined simply as “lookynge glass,” but Elyot includes “specularia,” the Latin term for spectacles; “spectrum,” meaning “any ymage or figure in a man’s ymagynation,” and finally, “specularis,” used to indicate “any thynge whereby a manne may see the better.”

In the early modern period, the widespread use of mirror-words in the titles of printed texts illuminates the multiple ways in which the mirror functioned for its Renaissance readership. The popularity of mirror-terms such as “speculum,” “looking-glass,” “mirror,” and “glass” across hundreds of early modern English texts testifies to the interest in and use of mirror terminology as both literal and metaphorical object. Mirror words were particularly popular in titles of texts after the medieval period (see the *Oxford English Dictionary*), such as William Baldwin’s well-known *A myrrour for magistrates* (1563). These texts were instructive, but many focused on the strongly religious connotations of the looking-glass: for example, *A chrysal mirrour, or, Christian looking-glass wherein the hearts treason against God and treachery against man, is truely represented* (1679) by Christopher Ness. Still others use the metaphor in conduct handbooks (the majority of which were aimed at female readers): *My ladies looking glasse* (1616) by Barnabe Riche, T. H.’s *A looking-glasse for women, or, A spie for pride: shewing the unlawfylnesse of any outward adorning* (1644), and *A looking-glasse for good vvomen, held forth by way of counsell and advice to such of that sex and quality*, written in 1645 by John Brinsley. These books offer a flavor of the use of the mirror in early modern printed texts directed at women. Such “mirrors” encouraged spiritual and moral self-analysis. Richard Brathwaite’s *The English gentlewoman* (1631), for example, is a treatise which offers guidance to women on virtue, modesty, humility, and other appealing morals. He urges women to take care with the mirror, for:
miserable is the condition of that Creature, who, so her skin is sleake, cares not if her soule be rough. So her outward habit be pure and without blemish, values little her inward garnish such an one hath made a firm Contract with vanity, closing her contemptuous age with a feareful Catastrophe.²³

Such is the danger for the woman who “bestowed too much time on her Glasse,”²⁴ so that she has lost interest in the needs of her soul, concerning herself only with the external, since this is what the mirror shows her. A blemish-free exterior tells nothing of the interior and of the purity of the soul. However, while a section of texts like Brathwaite’s highlight themes such as vanity, many others use the mirror differently: for example, as a metaphor in predictive texts that forecast the future.

In analyzing this material, we find a certain fluidity in the use of the mirror-terms. In the period in which Gumpp paints and Davies writes, around 1500–1650, the popularity of certain mirror-words shifts. During the early modern period, the terms most commonly used to describe the mirror were “looking-glass,” “glass,” “mirror,” and “speculum.” Each of these had variant spellings, and their usage both grew and fell in popularity throughout the period. For example, during the seventeenth century, “looking-glass” was extremely popular as compared to its use in the 1500s. The terms “speculum” and “mirror” had been more popular during the 1500s, but although they were still in use in the 1600s, they became less common in the latter part of the period.²⁵ As mirror technology altered, so the language of reflection began to change too. The looking-glass, once used to suggest a solely religious contemplation, came to be associated with a number of new meanings, including vanity and flattery. In literature and drama, the mirror was put to practical use. King Lear, cradling his deceased daughter in his arms, calls for a “looking-glass; / If that her breath will mist or stain the stone, / Why then she lives,” illustrating the possibility that the mirror can be much more than a “figure of God’s wisdom.”²⁶ This brief glance at the variations in word-use begins to suggest not only the continually shifting geography of Renaissance vocabularies of vision and sight, but also perhaps a link between the scientific and technological advances in mirror-making.

Spiller’s contention that “regardless of how true, what science makes is artificial in the sense that it is a product of human creation” correlates closely with the experience of the Renaissance individual and his or her mirror.²⁷ Each time the individual places a mirror before his or her self, they choose to create an image, “making” another self, but this self is not real, it is a fake, it is “made.” Simultaneously, however, looking in the mirror also becomes part of selfhood, and is undoubtedly involved in the understanding of the self, of the “real” self. The mirror in this context—a medium of fakery, truth, creation and wonder—was bound by its limitations as a man-made object: its technologies meant that its cloudy reflections, spotted surface, and restricted size and shape could lend themselves readily to the dual notions of truth and the counterfeit. These same qualities predisposed the mirror to become an aid in the fabrication of selves, so the looking-glass was placed in a dialogue which positioned the question of self-knowledge against a background of religious restriction.
The mirror in art

As Nicholas Mann and Luke Syson write, if “the portrait in the Renaissance has long been connected with the ‘cult of personality’ … held to have emerged in the fifteenth century,” the self-portrait must surely be the pinnacle of such opinion.28 Perhaps a crucial comment in the discussion of the mirror and the self-portrait comes in Leon Battista Alberti’s On Painting (De Pictura, 1435), where he describes the significance to painting of Narcissus’ mirror-moment:

I say among my friends that Narcissus who was changed into a flower, according to the poets, was the inventor of painting. Since painting is already the flower of every art, the story of Narcissus is most to the point. What else can you call a painting but a similar embracing with art of what is presented on the surface of the water in the fountain.29

The story of Narcissus relates the complexities of the “mirror,” which reflects for the viewer that which appears before it. The young man who looked into the pool could not comprehend the mirroring of the water’s surface, so his eyes were fooled by the mysterious phenomenon. Finally, the truth that glimmered on the surface of the pool reached Narcissus, and he comprehended his reflection, his self. Alberti compares the mirror and the surface of the painting with one another, relating their abilities to “embrace” art: the mirror is closely related to painting, placing the mirror as an object that is more than the passive reflector. Instead, the mirror becomes active participant in the pursuit of self.

Grabes, in his study of mirror-words used in early modern titles and texts, attempts to account for the mystery of the mirror when he explains that “glass mirrors exercised an unprecedented fascination by virtue of the material they were made of and its optical characteristics, and not least through the charm of their novelty and their high status as a technological marvel of the age.”30 Grabes places emphasis on the mirror as both metaphor and object, reminding us that “the mirror also became the object of scientific enquiry.”31

Deborah Shuger has argued that the “majority of Renaissance … mirror metaphors … reflect a face but not the face of the person in front of the mirror.”32 Shuger’s contention that what the individual sees in the mirror is a purely “exemplary image” rejects the suggestion that the advances which led to clear, flat mirrors may have propagated a “modern self-reflexiveness,” and thus an explosion of “autobiographical” genres.33 Yet, according to Joanna Woods-Marsden, the genre of the “autonomous” self-portrait was “invented in fifteenth— and developed in sixteenth-century—Italy.”34

The mirror was not only a captivating tool of science, but was also a well-used implement in the artist’s toolbox. Though artists such as Albrecht Dürer and Rembrandt painted themselves with no mirror visible in the portraits, other artists were far more explicit in their use of the looking-glass. Parmigianino’s well-known Self-Portrait in a Convex Mirror (1524, Figure 18) shows the mirror by inference in the shape of the portrait, its ovoid form recalling a popular style of looking-glass, and in the dysmorphic representation of the sitter-artist.
The distortions, obvious in the portrait, remind the viewer that the bulging surface of the convex mirror both increases and decreases the proportions of the objects placed before it, giving a malformed and inaccurate image of anything it reflects. This self-portrait, presented as something of a showcase for the artist’s talents, professes a singular interest in the self and the display of not only the man, but his talents and his genius. The choice of a convex mirror when a flat, plane mirror could have been procured for the purpose demonstrates Parmigianino’s willingness to avail himself of the differing accessible technologies and to use this opportunity to his advantage—portraying himself in a distorting mirror would have been a greater challenge, and therefore, to potential patrons, a more impressive feat.

Andrew and Catherine Belsey contend that if a mirror could connote morals, then the “wider availability of accurate reflection in the sixteenth century must at the same time have contributed to the individual’s sense of his or her own uniqueness.” While this is the argument Deborah Shuger tests and rejects in her essay, the links between the mirror and the self-portrait, and painting as a discipline, are embedded in the writings of artists and commentators of the period. Leonardo da Vinci in his notebooks counsels the artist to keep a mirror at his or her side while in the process of creating a work, as “the work will appear to you in reverse and will seem to be by the hand of another’s master and thereby you will better judge its faults.” However, to Leonardo, the mirror is more than a practical tool for the purposes of correcting paintings and drawings: he considers the surface of the mirror and the surface of the painting to be alike—a flat, plane surface—and the mirror is a receptacle which provides the perfect image of nature for the artist to imitate. Finally, Leonardo goes further still in his discussion of the merits of mirrors, and encourages
the painter to be the passive receptive witness that is the mirror in order that he or she might better represent nature.\textsuperscript{37} Coupled with the early modern “ambivalence” surrounding mirrors and their potential as “trustworthy ... reflectors of the world and as activators of immanent circumspection,” the mirror is both trusted and distrusted, capable of both truth and falsehood.\textsuperscript{38}

Vision and self-portraiture

Johannes Gumpp, an Austrian artist about whom very little is known, painted himself in 1646, and approached the task of the self-portrait from another angle:\textsuperscript{39} the artist produced a painting of himself which shows him standing in the center of the composition, in the moment of creation, with a self-portrait in progress to the right and the mirror bearing his reflection to his left. This composition, with its sense of immediacy, challenges the traditional single viewpoint of the self-portrait. The viewer, voyeur to the moment of creation, has three views of Gumpp, viewing him simultaneously from behind, from the side in the mirror, and from the side in the portrait, the angles of his body appearing slightly different in the mirror and in the painting on which he works. In these three versions, Gumpp presents his “real” self, represented by the central figure, his reflected self in the mirror, and his painted self on the easel. Gumpp’s self-portrait embodies Alberti’s impression of the painting as an “embracing with art of what is presented on the surface of the water.” In using this composition, Gumpp highlights the possibility of the multiple viewpoints afforded him by the mirror, and combines this with the unreality of the vision presented to the viewer. The trope of the painting is that the “real” Gumpp is still merely a painting, a creation. Gumpp’s portrait negotiates reflection and copy, highlighting the increasing distance from reality that each “counterfeit” or representation of himself makes. In so doing, “the painter reflects on the nature of illusion” and suggests “the precariousness and uncertainty of the real.”\textsuperscript{40}

Frederick Goldin has teased out some of the multiple functions of the mirror, considering them from a Platonic and Neoplatonic standpoint. Suggesting that because the mirror is a real object it has the “capacity of matter to receive the image of ideal forms,” Goldin claims that through this it is possible to:

\begin{quote}
consider both the matter and form together. The mirror awakens our consciousness of the idea by translating it into sensible images. It shows us an image of eternal beauty .... But that image is fleeting, it has no substance; and we must learn how to leave the mirror behind and to love a being that is invisible and immutable.\textsuperscript{41}
\end{quote}

Gumpp’s portrait, showing his multiple selves, speaks of a similar transience of images, selves, and reflections, illustrating various ways of “translating” the self “into sensible images.” Vision is manipulated and misled and, as the two pairs of eyes peering out of the painting remind us, human sight is drawn
into the imaginary as much as to the real. When Plato investigated the mirror in the *Timaeus*, he concluded that “specular illusion [is] the lowest degree of knowledge because it lacks the tangible reality of the image.” To Plato, the mirror’s value as a source of self-knowledge was highly dubious since the mirror was not to be trusted to provide an authentic reflection. Plato outlines its inconsistencies:

The right-hand side appears as the left in the image because the reverse parts of the visual stream are in contact with reverse parts of the object as compared with what happens in normal vision.

In Plato’s view, the mirror does not present the object as it appears in reality: the mirror is not a normal visual experience. What, then, does this say of the self-portrait, a form reliant on the mirror?

Gumpp’s image has much to tell us about the idea of difference. The most obvious distinction between the three representations of the artist is the difference between the tones and colors in the mirror’s reflection and the image on the canvas to the right. The image in the mirror seems both brighter and clearer than that of the portrait, and the tones of the colors in the mirror seem to match more closely those of the central Gumpp. In the painted image, however, the colors have a more sepia or dulled appearance, highlighting the distance from reality of the self-portrait and pointing to the interception of the imagination of the painter, who, unlike the passively reflective mirror, actively interprets the image before him. Each object or process interferes with the proximity to reality. Gumpp’s portrait is a reminder to its viewer that the self-portrait is, like Plato’s mirror, not a “normal” visual experience, and must not be trusted. Each stage of removal from the original illustrates disparities between chosen image, reflected image, and imagined image, so the mirror image of Gumpp is presented as more “true,” more “real” than the self-portrait. Gumpp’s self-portrait challenges appearances and subverts the expectations of reality in portraiture so that, as Stephen Greenblatt suggests, “any achieved identity always contains within itself the signs of its own subversion or loss.” Gumpp capitalizes on the functions of the mirror and uses it to his own advantage, challenging the viewer’s assumptions about the real, the painted, and the mirrored. Such sophisticated painterly manipulation, however, offers only a hint of how the mirror emerged and came to take an important place in Renaissance society and literature.

**The mirror in literature**

The mirror, whether literal or metaphorical, whether for prediction or guidance, inspired the creative imagination of English writers such as Sir John Davies. Davies was not only a poet; after studying law at Oxford, he had a successful legal career. He was also elected as a member of parliament, and was eventually appointed Attorney General for Ireland in 1606. He gained
considerable favor with Elizabeth I and James VI and I—James rewarded Davies with a knighthood—and is best known for his poems *Orchestra* (1594) and *Nosce Teipsum* (1599). “Of Humane Knowledge” in *Nosce Teipsum* explicates his theory of the soul using tropes of vision and the mirror.

In *Vanities of the Eye*, Stuart Clark reminds us that in sixteenth- and seventeenth-century Europe, a “kind of ocularcentrism was already prevalent … [which gave] the eyes priority over the other senses,” and Davies’s long poem presses the importance of the Delphic principle “know thyself,” incorporating the mirror, the eye, and vision into its narrative of self-knowledge. Beginning with the errors of Adam and Eve in the Garden of Eden, Davies guides his reader through the dangers of a life without self-knowledge. In the first instance, when Adam and Eve were free of sin, “their reasons eye was sharpe, and cleere” so that they “Could have approach’t th’eternal light as neere.” Adam and Eve are close to God because, in them, their “reasons eye” is acute; however, once they taste the fruit of the tree, they “give Passion eyes, made Reason blind,” so that “then grew Reason darke, that she no more / Could the fair Formes of Truth, and Good discerne.” Through the metaphors of sight, Davies locates the human “desire to learne,” and concludes that we “still tast of the fruit forbid” when “In bookees prophane, we seek for knowledge hid.” From this, Davies constructs the difficulties that this distance from clear reason presents to the individual:

What can we know? or what can we discern?
When Error chokes the windowes of the mind;
The diverse forms of things how can we learne,
That have bene ever from our birth-day blind?

Here again, the concept of knowledge is constructed through the metaphors of vision, referring to glass (and its clarity), as well as to blindness, which, compared with the sharpness of reason’s vision in Adam and Eve, distances the individual in his or her relationship with God. Davies’s principal instruction to the reader is that if we wish to gain access to knowledge, we must first know ourselves. Invoking the words of St. Paul in I Corinthians, “For now we see through a glasse, darkely; but then shal we see face to face. Now I know in parte; but then shal I knowe even as I am known,” *Nosce Teipsum* explains the omnipotence of God:

All in him selfe as in a glasse he sees,
For from him, by him, through him all things bee;
His sight is not discoursive by degrees,
But seeing the whole each single part doth see.

St. Paul’s words, considered particularly difficult to translate, are here echoed by Davies. The use of “through” has often led critics, such as Shuger, to suppose that the “glass” St. Paul invokes is a clear pane of glass, a window; however, in I Corinthians in the Vulgate, the word “speculum” is used—that is, a mirror. Davies’s interpretation suggests that the glass is a mirror, and the use of “through” indicates that the mirror is the medium by which the individual
must analyze the religious self in order to progress towards the “eternal light.” The sense of omnipotence suggested in St. Paul's words is conveyed in Davies’s verse through the use of “discoursive,” which—following the Oxford English Dictionary, which quotes the above lines of Davies—is illustrative of “passing from premises to conclusion, opposite to intuitively.” For Davies, “His” sight is not discursive; rather than knowing in part, through logic, “He” knows holistically, intuitively, “seeing the whole,” and so comprehending the parts. To know ourselves takes effort because, in Davies’s Platonic logic, we are not biologically created in a way that makes self-knowledge easy:

Is it because the minde is like the eye,
(Through which it gathers knowledge by degrees)
Whose rayes reflect not, but spread outwardly,
Not seeing it selfe, when other things it sees?

Davies compares the mind and the eye: both, he feels, “gather” information, incrementally, absorbing “knowledge” in a piecemeal fashion. In this way, neither the eye nor the mind offer an immediate contribution to knowledge, since the flow of information is external, not internal. Here, Davies judges that the eye and the mind do not “reflect,” they cannot examine themselves since they can only absorb information. Plato’s extramission theory of vision states that the light flows outwards from the eye to meet the object before it:

So when there is daylight round the visual stream, it falls on its like and coalesces with it, forming a single uniform body in the line of sight, along which the stream from within strikes the external object … the motions caused by the stream coming into contact … penetrate right through the body and produce in the soul the sensation which we call sight.

Following Plato, Davies too suggests that the eye is not the method by which the individual may study and know the self. Rather, the mind has the properties of a mirror:

for the minde can backward cast
Upon herself her understanding light;
But she is so corrupt, and so defac’t,
As her owne image doth her selfe affright.

The mind, for Davies, has the ability to throw back a reflection to the viewer and put light on a subject in a way that vision cannot; however, the “mind” is as dimmed and stained, as corrupt as the soul. Nature has placed the eyes on the front of the face, making inward vision via the mechanisms of sight an impossibility—we must utilize the properties of the mind to glimpse the stained soul. This “mirror” is the bearer of truth for, in the next stanza Davies relates the tale of Io, who was turned into a cow:

As is the fable of that Ladie faire,
Which for her lust was turned into a Cow;
When thirstie to a streame she did repaire,
And saw her selfe transformed she wist not how.

At first she startles, then she stands amaz'd,
At last with terror she from thence doth flie;
And loathes the watrie glasse …
And shuns it still, though she for thirst do die. 59

Io was, before she visited the water, unaware of her physical transformation—without a mirror, she cannot know herself. Such is the horror of the truth of her situation that she would rather die than re-approach the water to satisfy her thirst. Her sins, all too apparent in her bodily appearance, can be avoided if she refuses to look at herself in the mirror. Her mind’s “mirror” is “defac’t,” so frightened by the truth that she decides to “make” an imaginary “self,” ignoring the water-mirror’s truth. Through this, her mind’s inward “mirror” and inner truth is obscured and dimmed by the more palatable counterfeit “self” she creates for herself.

The concept and power of the mind’s eye was exploited by Shakespeare, since when events occur offstage, “playgoers are stimulated to use their mind’s eye, their substitute way of seeing as a substitute way of knowing”: so Io reverses this in order to attempt to blot out what she knows of herself, her true self. 60 Rather than the “stimulation of cognition by imagined sight” which, Arthur Kinney explains, occurs when viewers cannot know, Io can know, and thus makes a deliberate attempt to disengage “cognition” and replace it with a more comforting “imagined sight.”

Reason takes precedence over all other faculties and it is most affected by the sins of the individual. Reason, given the sense of sight, finds its vision darkened by sin and it becomes damaged and weakened, subject to the dangers of the passions. Davies follows Plato’s formulation of vision to account for the difficulties inherent in self-knowledge, citing the story of Io as an illustration of our natural aversion to the horrible truth uncovered when we finally examine our self. In all of this, the mind is key, a receptacle for the information that the eyes bring into the body, a mirror for the soul so that “she” might better understand herself.

**Tripartite structures**

Gumpp’s self-portrait shows three views of himself—reality, mirror, and copy. Similarly, Davies creates a tripartite structure when referring to God when he “lookes on Adam as a roote or well / And on his heires as branches and as streames.” 61 Here, God is origin, Adam is “root,” and Eve is “branch,” making a clear demarcation between origin (or perhaps seed), foundation (or root), and offshoot (or branch): each time, the distance from “reality” increases. Phillip Stubbes in his *Anatomie of Abuses* (1583) applies this structure to the creation of Adam and Eve, noting that God “made man after his own likeness,
& similitude, geuing him a woman, made of a ribbe of his own body.”62 So, just as the roots of the tree generate life from earth, Adam was made, and Eve, growing out of Adam’s body, becomes most removed from the image of God, from the origin.

Ritamary Bradley, exploring the use of “speculum” in mirror-titles of medieval texts, examines the idea of the tripartite structure in scripture and finds it intertwined with both vision and mirrors. Bradley quotes theologian and poet Alanus de Insulis (1114–1203), who “builds up a hierarchy of truth” to argue that “three-fold is the mirror in which you ought to look: the mirror of the Holy Scriptures, the mirror of nature, and the mirror of creatures.”63 Bradley claims that each of these shows us what we ought to be, so that “in the mirror of the Scriptures you see your present state; in the mirror of creatures you see yourself as a wretched one; and in the mirror of your human nature you judge yourself as guilty.”64

Just as Davies’s poem portrays a body and soul caught up in the difficulties of self-knowledge, so Bradley highlights how this is reflected in scripture. This trinity of mirrors encompasses and describes the scrutiny of the self as Davies portrays it, and perhaps, as Gumpp may allude to it—self-knowledge is bound up with mystery, potential inaccuracies, with mirrors and vision. Both Bradley and Davies place reason at the center of this division, its role being key in achieving true self-knowledge. As Bradley describes it, “reason is the true mirror wherein right things appear right and left things appear to be left, thus reversing the qualities of the mirror that lead Plato to distrust it.”65

These works by Davies and Gumpp illustrate the role of the mirror in the formation of early modern selfhood, highlighting the dialogue of religion, pride, vanity, and virtuous behavior that frames any exploration of inwardness in this period. However, more than this, these pieces reveal the imprint of technology; optical deception and visual trickery are made manifest in Gumpp’s self-portrait, while metaphors of vision are inscribed in the verses of Davies. Both texts take advantage of the opportunities that the mirror offers, incorporating its connotations into their explorations of self and selfhood.

Notes

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2 The range of mirror-related research available suggests the importance of, and continuing fascination with, the mirror: Bruno Schweig, Mirrors: A Guide to the Manufacture of Mirrors and Reflecting Surfaces (London: Pelham Books, 1973);


6 Ibid., 3–9.

7 Melchior-Bonnet, *The Mirror*, 12.


10 Ibid.


12 Eileen Reeves, *Galileo’s Glassworks: The Telescope and the Mirror* (Cambridge, MA and London: Harvard University Press, 2008), 47. Reeves notes that “reading stones' … that provided slight magnification to the page beneath them, appeared around the mid-thirteenth century, and convex lenses were adapted as reading glasses shortly thereafter.”


15 Ibid.


17 Reeves, *Galileo’s Glassworks*, 57.


This survey of the uses of mirror-words was conducted using keywords in EEBO. The instances of the keywords appearing in the titles of the texts were thus collated to offer this very brief analysis of the shifts in the common usage of certain mirror-terms.

Ibid.


Ibid., 21


Ibid., 202.


There are two versions of Gumpp’s Self-Portrait, both of 1646. The image to which I refer is currently in a private collection, the location of which is unknown. However, it can be viewed freely at http://commons.wikimedia.org/wiki/File:Johannes_gumpp.jpg (accessed August 14, 2010). The other version can be found in the collections at the Uffizi in Florence.

Melchior-Bonnet, The Mirror, 168.


Ibid., lines 28, 33–4.

Ibid., line 35.

Ibid., lines 38, 40.

Ibid., lines 57–60.

The glass vessel and the “speculum sine macula” were symbols often used to connote the Virgin Mary. Rubymaya Jaeck-Woodgate explains that the mirror, in its religious context, is commonly used to “imagine the relationship between God and creation,” and particularly, “the notions of man as the imperfect image of God, and Christ as the exemplar of mankind”; Rubymaya Jaeck-Woodgate, “Jacopo de Varagine’s Virgin Mary as the ‘Mirror without Blemish,’” *Australian Journal of Theology* 10 (2007), 3.


Ibid., lines 113–16.


Phillip Stubbes, *The anatomie of abuses* (1583), EEBO.


Ibid., 112.

Ibid.
“Nearest the tangible earth”: Rembrandt, Samuel van Hoogstraten, George Berkeley, and the optics of touch

Alice Crawford Berghof

The three-dimensional, sculpted surfaces of paintings by Rembrandt and Velázquez reveal traces of manual labor. The medium of the rough style is made of thick paint and layered surfaces, and its method visible strokes of the brush, the imprint of the hand, the mark of tools, and the impact of drops of paint scattered and flung. The real, physical work of artists and apprentices subsumes in importance the depicted work of the painted figures as well as the thematically interpretive work of the viewer. Visual narratives of politics and optics coalesce in highly textured surfaces that call to mind etching as well as the crafts of woodcarving and metallurgy, and the vocations of farming and food preparation. To the extent that the work of creating art in Rembrandt's studio was a cooperative effort, and in the sense that sculpting of paint calls to mind not merely his etching, but more broadly the late medieval, early Renaissance craft and guild tradition—something to be transcended by the courtly art of painting—the sense of touch renders political the handling of paint as a subject as well as a technique of early modern art. Visible clues as to the manner of tactile manipulation of paint call attention to the manner and mode of artistic expression and reception, allowing the fact of the medium to compete with the significance of the tasks of the painted subjects as well as the contemplation of the viewing subject. The effect of the rough style is to invite the viewers to participate in their own creation just as they are implicated in the ideological decisions of the artist.

Optically, the rough style can be considered a manifestation of the debate over the most effective way to achieve verisimilitude in the depiction of depth. It is for his rejection of abstraction that George Berkeley is an apt counterpart to Rembrandt. According to Berkeley, what is commonly misinterpreted as visual perception is actually two experiences: the sense of sight, and the imagined sense of touch; the latter is made of the neurology of retinal movement, inductively constructed projections based on the private logic of memories,
and the public logic of social realities and scientific discoveries. Newtonian calculus, for example, would not have been possible if it had capitulated to the sway of empirical models for necessarily abstract mathematical measures such as the point, the line, and infinite extension and divisibility—what one might call a Baconian optics of inquiry, measurement, and annotation, proceeding according to the principles set forth in A New Theory of Vision. Painstakingly accurate taxonomies, Robert Hooke’s drawings of microscopic discoveries, and Antoni van Leeuwenhoek’s findings and theories are to the understanding of Berkeley’s optics what guilds and manual labor are to the understanding of Rembrandt’s style: the pursuits of each are motivated by an implicit connection between the imagined or projected senses of touch and sight.

In Berkeley, the term “tangible object” becomes a metaphor when the phrase is used to call to mind those things which exceed one’s grasp, just as in Rembrandt the rough texture sometimes becomes smooth just at the point where the viewer’s reach would, literally, fail to extend into the three-dimensional space of the painted world. In Rembrandt’s work, the sculpted texture is a metaphor for the properties of light. Rembrandt’s rough style and George Berkeley’s notion of the “tangible object” use tactile images to picture the process of vision. The understanding of early modern theories of depth perspective depends on narratives, fictions, and metaphors that invoke the sense of touch in order to heighten the importance of manual labor.

That early modern descriptions of vision and touch are intrinsically concerned with kinds of work is a Leitmotif of this chapter. I will consider the topic of contemporary phenomenology, the provenance of Hanneke Grootenboer in The Rhetoric of Perspective: Realism and Illusionism in Seventeenth-century Dutch Still Life Painting. In suggesting an alternative form of phenomenological analysis, I merely mention the possibility that to Rembrandt and Berkeley, one might apply critically the principles of Heidegger’s late work in the essay “Building, Dwelling, Thinking” in Poetry, Language, Thought. There, the worker who carries heavy parcels across a bridge every day dwells in the place, through sense of touch, less profoundly than one who views and experiences the place as a novelty. This opposition is one that the present chapter seeks to question.

The technique of late works by Rembrandt and Velázquez participates in a paradox in which the anonymous individual is silenced by the collective will, while the individuality of the viewer is supplanted by the view of a multitude that, for example, in Vision and Painting: The Logic of the Gaze, Norman Bryson finds kneeling in prayer before a high vanishing point until the viewers’ identities are displaced by the machine-like construct of the disembodied, late-Renaissance, central vanishing point. The achievement of the rough style is to question the proto-Enlightenment mechanization of the eye and to challenge the depersonalization implicit in art as an industry. The notion of shared experiences of work is the achievement not of the connoisseur, nor of the patron, but of the painter and the studio.
Contemporary criticism, grit, and the slide rule:
The rough style resists abstraction

The materiality of the painted surface in the seventeenth century is a topic addressed by a vast array of art historians, from Heinrich Wölfflin to Barbara Stafford. The following will refer to those who discuss visible brush strokes in Rembrandt and Vermeer. Much admirable work on the subject will be mentioned in passing. One important exception is an interesting article by Donald Posner on the politics of the materiality of paint in France. This article, “Concerning the ‘Mechanical’ Parts of Painting and the Artistic Culture of Seventeenth-century France,” succinctly summarizes many of the debates surrounding the rough style. The article begins with a discussion of one seventeenth-century patron whose beliefs Posner describes thus: “Painters who devoted their best efforts to the ‘mechanics of the art’ were … nothing more than craftsmen, and people who admired them were ignorant.”

Another exception is the encyclopedic *Pittoresco: Marco Boschini, his Critics, and their Critiques of Painterly Brushwork in Seventeenth- and Eighteenth-century Italy* by Philip Sohm. Sohm provides scholars of early modern art with a comprehensive, thought-provoking survey of Italian debates over the pictorial and linguistic value and meaning of visible brush strokes. For purposes of the present study, the most useful aspects of his work are the comprehensive list of terms for variations on self-referential styles of painting; the careful charting of the seventeenth-century acceptance and celebration of the previously maligned rough style, and the exploration of the way *pittoresco* conveys depth and proximity as well as light and shadow.

In the wide variety of terms Sohm offers for material aspects of painterly technique, the most notable feature is perhaps the most telling oversight: the failure to distinguish among terms for painting, seeing, and judging, and the absence of a distinction between the manner of painting tangible objects, on the one hand, and on the other, the manner of painting intangible aspects of the surroundings such as clouds or light. For example, in the midst of an admirably exhaustive list taken mainly from Marco Boschini’s 1660 treatise *La carta del navegar pittoresco*, Sohm defines *sfodra* actively, referring to the “unsheath[ing] the brush” in an analogy that aligns the artist’s free brushwork with the graceful strokes of fencing. *Bulegar*, in contrast, refers to an aspect of the viewer’s perception, and signifies the quality of “dancing spots” or retinal movement. Although the importance of his work cannot be overestimated, the usefulness of Italian terms must be qualified by research into Dutch beliefs. In “Schilderachtig: Discussions of a Seventeenth-century Term and Concept,” for example, Boudewijn Bakker warns against the tendency to equate the term *schilderachtig* with the material aspects of *pittoresco*. By way of a vast collection of references, Bakker concludes that the Dutch use their term to refer to real objects that are apt subjects for painting. In this sense, one might say that light itself is *schilderachtig*. (Another useful article on Dutch terminology is “The Concept of Houding in Dutch Art Theory,” by Paul Taylor.) The taxonomic
limits of Sohm’s project will become the central theoretical concern of this chapter in its attempt to reveal the way Rembrandt and Berkeley represent the physical properties of light. Although Sohm describes several instances in which visible brush strokes represent light, he does not discuss optics. He treats light as a tone or shade of color, rather than a series of waves or a pattern of particles.

Current scholarship warns against excessive concern with visible brush strokes when this concern feeds on anachronisms, or when present-day theories impose onto early modern art a modernist aesthetic. Thus, when Svetlana Alpers and Harry Berger, Jr. speak of the visible manifestations of the handling of paint, both emphasize the importance of the artist’s seventeenth-century cultural, ideological, technical, and optically oriented decisions. In *Fictions of the Pose: Rembrandt Against the Italian Renaissance*, Harry Berger, Jr. argues against the attribution of a “‘modernist’ effect in Rembrandt,” claiming that it is:

> an effect contained—present but domesticated—within and by a body of painting that still, however reluctantly and rebelliously, follows the dictates of the graphic regime of early modern painting.10

In contemporary art historical descriptions of technique, there is a prevalent use of prosopopoeia or grammatical personification. This aspect of rhetoric is telling, and calls to mind the animate quality of fabric in the foreground of many Rembrandt portraits, for example. For Berger, it is the “body of painting” that acts “reluctantly and rebelliously.” He continues:

> My interest, following that of Alpers, is in the way Rembrandt’s conspicuous handling of paint may be interpreted in politico-formal terms as a counterpractice that targets the graphic investments and representational desires of those who wield the power of commission.11

In this sense, the references to work can overpower the celebratory function of portraits. Berger pursues the political implications of *sprezzatura* or the rough and carefree style of several works, arguing that this mode of painting sets the social history of Castiglione’s courtliness against the neurology of seventeenth-century optics. Rough strokes may reveal the trajectory of a carefree gesture or the calculated attempt to achieve optical illusions close to the picture plane.

This chapter attempts to take as a starting point the work of Alpers and Berger in order to pursue various senses in which artistic materiality opposes and attempts to dismantle the hierarchies of patronage. It will not pursue the implications of the call to action; however, such an imperative is a direct result of the emphasis on methods of artistic work. Rather, it will explore the substratum, the pictorial implications of theories of depth perspective. Berger’s reference to Alpers’s *Rembrandt’s Enterprise: The Studio and the Market* is instructive:

> “The master’s touch,” as Alpers describes it, can be ungentle. She notes how, in many works, “Rembrandt’s rough painting mode … calls attention to the kinship between pigment and human flesh,” and how, in such works as the
Slaughtered Ox and the two anatomies, he “identifies the painter with the role of one—butcher, hunter, surgeon—whose hand cuts and delves into the body.” These analogies recall the processes of etching and engraving, in which the hand holding the needle or burin presses it into the ground or the copper.12

Berger argues that to interpret the ideological effect of sculpted paint is to transcend the logic of stylistic verisimilitude based on the appearance of the objects depicted. He finds materiality to be incorporated into an economy of realistic representation in what he calls a “dialectical structure of the Rembrandt look in painting.”13 (362) Others have implied that social relations are not allegorized overtly by the narrative content of the picture, but indirectly in the interaction between the viewers’ world of work and the images of manual labor called forth by the viscosity and deployment of the paint.

The references in Berger and Alpers to the istoria or theme of the painting at hand can be used to interpret any work of art that involves cutting, shaping, or molding a malleable substance. In its interest in the handling of paint, Berger’s work can be set on a logical continuum built on the conclusions of the following: early Svetlana Alpers, early Norman Bryson, Ernst van de Wetering, later Norman Bryson, Georges Didi-Huberman, and Svetlana Alpers in her work on Velázquez. The trajectory begins and ends with Svetlana Alpers, first addressing the social cooperation and collective effort of the studio in Rembrandt’s Enterprise, and culminating in the thought-provoking and concise study of Velázquez’s technique.

In The Vexations of Art: Velázquez and Others, Svetlana Alpers makes a cautionary point that is similar to Berger’s, but places greater emphasis on the materiality of paint, the “unfinished manner of painting,” and the artwork’s “identity as paint.”14 In a painting of women at work, Alpers says of the thick, vibrant brush strokes in Velázquez’s The Spinners and its analogies that the paint is “skein-like.”15 Unlike many contemporary art historians, Alpers argues that Velázquez uses palpable brushwork to efface rather than achieve three-dimensionality:

The common handling of paint across the field contributes to the implicit denial of distance or depth. But this all-over effect in Velázquez’s brushwork is not a precursor of modernity. It is simply one possibility of painting.16

In what will emerge as Van Hoogstraten’s optics, Velázquez can be said to invoke distance in order to deny its existence. The optical theory in this painting need not be modernist in order to be self-referential. In this sense, Alpers’s discussion of Velázquez may be set against Grootenboer’s discussion of seventeenth-century still lives, a discussion she explores by way of Cézanne, Merleau-Ponty, and the “notion of depth as a certain ‘thickness.’”17 While it is possible to situate Grootenboer’s work in an early modern debate over the importance of the thickness of paint, it is more promising to note the usefulness of the notions of phenomena, phenomenology, and self-consciousness. In the spirit of The Art of Describing: Dutch Art in the Seventeenth Century, Alpers makes
the fascinating suggestion that the early modern artistic sensibility used paint as a form of description that reveals intentionality. Discussing Manet’s debt to Velázquez, Alpers says: “In effect, both painters depict the world seen, but also the world, obviously, even willfully, painted.”

The next step, one that Alpers does not take, would not pursue the doctrine of modernist abstraction but rather the seventeenth-century interest in the limits of representation. One might argue that miniatures, models, and the camera obscura captivate the imagination of seventeenth-century painters and viewers alike; in this sense, one might ask whether late Rembrandt and certain aspects of Vermeer are based less on studio posing than on the already artificial semblance of people and objects.

This is one implication of Norman Bryson’s analysis of Vermeer’s The Artist in His Studio in Vision and Painting: The Logic of the Gaze. Deviating from his conclusions, even without recourse to computers and the “non-empirical Gaze,” one might argue that the lack of distinctness in the depiction of the chandelier may not be a result of a decision to annotate certain objects using sparse visual information. Bryson finds paradoxical the following:

> Whereas the map is painted through meticulous transcriptions, with each detail of the map reproduced on canvas by a direct one-to-one isomorphism, the reflections of the chandelier are handled through the broad strokes of a brush loaded with liquid pigment: with the map the work of the brush is assiduously concealed; with the chandelier it is advertised, as an elliptical technique at odds with the careful one-to-one correspondences and precise transcriptions of the map.

It is quite possible that, coming after Rembrandt, Vermeer is not annotating aspects of the interior seemingly represented in the painting, but is annotating theoretical aspects of the preceding tradition of depth portrayal. In order to convey depth after Rembrandt, it is no longer necessary to convey a sense of uniformly vanishing brush strokes. In choosing to portray a chandelier made of paint, Vermeer may have intended to emphasize the realism of imperial expansion by showing the map in sharp relief even though it is in the background. While Vision and Painting as an early and canonical text founds a metaphysics and geometry of late Renaissance painting, the later collection of essays covers the topic of illusionism, depth perspective, and the sense of touch.

Norman Bryson’s Looking at the Overlooked: Four Essays on Still Life Painting addresses similar concerns, most notably in the passages on the manipulation of the texture of paint made to resemble stone and woodwork from the time of the Romans to the Golden Age. Several other art historians are closely associated with the study of materiality and depth perspective. Among the critics who discuss the materiality of paint in earlier eras, one worth mentioning is Georges Didi-Huberman. In Fra Angelico: Dissemblance and Figuration, he writes of the “splattering of gaudily colored blotches pointing toward the idea of marble,” the Augustinian and Thomistic significance of the colors and textures of spots of color in the foreground of two Annunciations,
the “plasticity” of paint, and the “overdetermination of meaning.” His work demonstrates that a style of painting can suggest the idea or the function, rather than merely the form or shape of an object. His theologically informed analysis provides the foundation for any early modern study of the materiality of paint. The seventeenth-century version of this theory finds signs of human fallibility in place of what was previously imagined as the divinely inspired deployment of paint.

The most significant influence on the present study is *Rembrandt: The Painter at Work*. Ernst van de Wetering laments the fact that the art historical study of style suffers from the oversimplification of:

polarities set out by Heinrich Wolfflin (1864–1945) in his *Kunsthistorische Grundbegriffe* (*Principles of Art History*, 1915): the linear and the painterly, plan and recession, the closed and the open form, multiplicity and unity, and absolute and relative clarity. These are abstract pictorial constructs which differ fundamentally from the means of achieving spatial illusion discussed by Hoogstraten.

The significance of Van de Wetering’s contribution is that he reverses the conclusions of Berger and Alpers. His work on Rembrandt reveals that the study of visible brush strokes is not a modernist atavism, but a quintessentially seventeenth-century preoccupation. This chapter owes to his text the discussion of materiality and light, as well as the analysis of Van Hoogstraten’s theories in relation to Rembrandt’s work. The following brief summary will not criticize his method, but rather illuminate points of departure from his conclusions.

In the section entitled “The Visible Brushstroke” from Chapter VII, “Rembrandt’s Brushwork and Illusionism: An Art-Theoretical Approach,” Van de Wetering charts a variety of interpretations of Rembrandt’s rough style. The conclusions range from the observation that this style was an aspect of verisimilitude that reveals Rembrandt’s intention that his paintings be viewed from a distance to the idea that the rough style “was a manifestation of the artist’s freedom and power over his own creations.” In both cases, the author claims that visible brush strokes achieve a “representation of reality that could be more convincing than that found in a finely brushed work.” In the analysis of the visibly palpable quality of paint in *The Night Watch*, for example, Van de Wetering argues that Rembrandt depicts three-dimensionality by painting nearby objects more roughly than those in the distance. This fails to take into account what others have said about Rembrandt’s late works, and what some have said of the etchings. Many find that the rough style is not deployed according to depth, but rather less geometrically, in a pictorial logic that emphasizes the symbolic significance of the objects depicted. This chapter will explore such logic in *Jeremiah Lamenting the Destruction of Jerusalem*, for example.

Although Van de Wetering’s description of light is poetic, it is based on a strict model of geometrical, surface imitation. In his fascinating exploration of the “plasticity” and visible brushwork of *The Jewish Bride*, he argues that “the dragging hairs of the brush have drawn furrows that catch the light.”
Further, he links Rembrandt’s rough style with Samuel van Hoogstraten’s notion of “perceptibility,” interpreting Van Hoogstraten thus: “the somewhat coarse surface of the paper gives the eye something to focus on, making it appear substantial, perceptible, and thus close at hand.”26 Here and elsewhere, notably in the discussion of portraits such as the 1661 Portrait of Margaretha de Geer or, earlier, the 1634 Portrait of Haesje van Cleyburgh, Van de Wetering follows Van Hoogstraten and others in considering rough brushwork to effectively mimetically represent the shape and contours of real objects, especially those close at hand.27 The goal these theorists ascribe to Rembrandt is to catch the attention of the viewer by capturing light or by providing an intricate and therefore captivating surface pattern, much the way the actual object would achieve these results. Van de Wetering takes the rough style entirely in its function as sculpture, leaving behind the possibility that the style could be interpreted according to two-dimensional semiotics. This chapter will align Rembrandt with later theorists such as George Berkeley in order to demonstrate that the rough style is not simply part of a debate over the way to achieve superficial verisimilitude, but is rather a style that takes part in a larger, scientific dialogue concerning optics.

This chapter departs from Van de Wetering by claiming the following: the rough quality of Rembrandt’s brushwork does not simply depict real people and objects that end up absent in the real world and magically, even quite literally, three-dimensionally present in the world of a painting. When the sculpted paint becomes an object in its own right, it ceases to function in a purely mimetic sense, even though it may be said to continue to fulfill a mimetic function. Paint can emerge from the surface of the canvas as a sign of the hand of the artist and his associates in the studio; as a seventeenth-century icon of pure paint in works reflecting on their own medium of expression; as an image of hypotheses about waves and particles of light, and finally, as a transformative series of discrete units that abandon superficial verisimilitude for more profound imitation of what we would now call the neurological process of perception. As much as Rembrandt’s style makes the viewer want to touch the painting, it causes his or her eyes to leap. In this final, double effect, Rembrandt’s late style anticipates the importance of retinal movement in late seventeenth-century and early eighteenth-century European theories of vision in the work of Hobbes, Malebranche, and Berkeley, for example.

It is beyond the scope of this chapter to provide a thorough analysis of seventeenth-century optics. Such an analysis might begin with a summary of Lenses and Waves: Christiaan Huygens and the Mathematical Science of Optics in the Seventeenth Century by Fokko Jan Dijksterhuis.28 The following is a brief series of relevant findings, accompanied by the corresponding interpretation of Rembrandt’s style. The underlying theme of the text is the opposition between the abstract, geometrical mathematics of perspective theory on the one hand, and the physics of refraction on the other. In this sense, the text provides a useful counterpart to any early modern art-historical discussion of the importance of disegno in relation to the materiality of paint. First, the
discussion of refraction and the sine law conjures images of the folds of cloth and their reflection in the water in *A Woman Bathing*, for example. Second, the blunt shapes of brush strokes in the foreground of late works such as the 1658 *Self Portrait* could be said to move across a “rectilinear path” of what the author explains Hobbes believed to be “pulses” of light. Robert Hooke and others subscribed to this view, which Dijksterhuis describes thus: “short, vibrating motions of luminous objects produce pulses that propagate rectilinearly through a transparent, homogenous medium.” Third, Newton and Huygens, in their interest in “the physics of unobservable particles,” parallel Rembrandt’s treatment of paint as if it is the substance of light itself. Finally, the culmination of the text, in its exploration of Newton and Huygens in their physics of optics, is an important foundation for Rembrandt scholars interested in studying visual effects achieved by sculpted paint.

Significant corollaries to this approach can be found in *Vermeer and the Art of Painting* by Arthur K. Wheelock, Jr., and in a variety of studies that use x-ray technology to examine and imaginatively reconstruct the materials and processes of compositional techniques. Such work should begin, of course, with *Methods and Materials of Painting* by Sir Charles Lock Eastlake. In its careful, stepwise recounting of the preparation of paints and varnishes, this work should inform any study of the relationship between the chemistry and physics of painting. A third example, *Vermeer Illuminated*, traces the way the artist achieved refraction in the *View of Delft* and in the *Girl with a Pearl Earring*. In this text, as in Wheelock, the chemistry of paint, as well as the order and timing of its application, frequently give insight into the way that highly textured paint replicates the play of light on real or plausible models for those works. However, though these texts, along with Van de Wetering, provide an invaluable foundation for the trajectory of the present essay, they do not study the physics of optics. In its emphasis on the creative force of paint, a much closer analogy for the present work is the following passage on Turner in *Illustration* by J. Hillis Miller:

Turner’s project as a painter was to create out of paint a second sun that would be not an imitation of light, but a light-source in itself. Turner wanted to make of earthly materials that produce colour by reflection an equivalent in power of the aerial colours made by the prismatic splitting of pure white light.

It is my argument that the luminous, sculpted surface of Rembrandt’s late work, if not “a light-source in itself,” conveys the properties of light.

**Seventeenth-century depth perspective and the irony of tactile imagery**

From Alberti to Berkeley, manuals on painting and treatises on optics find recourse in the importance of the sense of touch. At moments where deductive reasoning fails, conundrums and aporias are effaced by tactile metaphors.
Van Hoogstraten's 1679 treatise on painting, *Inleyding tot de Hooge Schoole der Schilderkonst*, is a pastiche of received knowledge and innovative, practical advice. The work has not been translated in its entirety; the best translations can be found in Celeste Brusati's *Artifice and Illusion: the Art and Writing of Samuel van Hoogstraten*, and in smaller excerpts, in Ernst van de Wetering's book on Rembrandt. Van Hoogstraten's text participates in the tradition of *ut pictura poesis*, in making analogies between painting and literature. As Celeste Brusati demonstrates in summaries and excerpts, Van Hoogstraten divides his treatise into nine parts, corresponding to the nine muses of poetry; the nine sections are imagined as classrooms in which one might imagine students learning the principles of the trivium: grammar, logic, and rhetoric. In many cases, he makes overt reference to the descriptive similarities between painting and writing. At a technical level, he aligns colors with syllables, and shadows with tragedy. In rejecting the classical understanding of painting as an art of persuasion, Van Hoogstraten implies that the methods of painting are aspects of mechanics, and would be grammatical rather than rhetorical in nature. The visibility of brush strokes is considered an important means of representing the optical process.

As recounted in Van de Wetering, Van Hoogstraten's quest in the 1679 treatise (published, Van de Wetering tells us, "some thirty years after its author had left Rembrandt's studio") was to reverse the assumption:

> current in his day (and indeed since antiquity) that light passages in a picture tend to advance towards the viewer while darker tones recede .... Instead he proposes another element which he considers far more important for the effect of three-dimensionality. In discussing this element he employs the concept of "perceptibility" (*kenlijkheydt*), which he refers to in connection with a coarse surface.

Van Hoogstraten's observation is important in understanding the effectiveness of depth perspective in a variety of early and late portraits, most notably *The Syndics*.

In a telling example, "the somewhat coarse surface of the paper gives the eye something to focus on, making it appear substantial, perceptible, and thus close at hand ...." 37

Van Hoogstraten advocates certain methods of painting texture as effective ways to achieve verisimilitude or, in Berger's terms, realism. In this sense, the painting is a final product to be viewed inductively, as an instance from which illusion-making principles can be inferred. The foundation of Van Hoogstraten's view came much earlier, in Descartes's *Optics*. The physics of light dictates that distant objects appear faint, given the relative weakness of the vibrations stimulating the optical nerves.

Here is the pertinent passage in Van Hoogstraten, as quoted in Van de Wetering:

> I therefore maintain that perceptibility [*kenlijkheydt*] alone makes objects appear close at hand, and conversely that smoothness [*egaelheydt*] makes them withdraw, and I therefore desire that that which is to appear in the
foreground, be painted roughly and briskly, and that which is to recede
be painted the more neatly and purely the further back it lies. Neither one
colour or another will make your work seem to advance or recede, but the
perceptibility or imperceptibility [kenlijkheyt or onkenlijkheyt] of the parts
alone.\footnote{39}

An apt illustration of this principle is the 1654 Louvre Bathsheba at Her Bath
(also called Bathsheba with King David’s Letter). The relatively serene and
somewhat resigned facial expression of the central figure contrasts sharply
with the complexity and confusion of surfaces and angles in the fabric close
to the viewing plane. In this case, as with other late works, there is a mood as
well as a manner to the handling of paint.

Brusati notes that Van Hoogstraten’s work is informed by the work of
Dürer, Bacon, Descartes, and Netherlandish contemporaries. In the etching
for the title page of Book Two, Polymnia or the Muse of rhetoric and memory
gazes at statues covered in a three-dimensional, Dürer-esque grid. Given his
convictions that the role of art is to depict objects rather than sway emotions,
Van Hoogstraten rejects the clean lines and sparseness of classical aesthetics
in favor of the taxonomic complexity of northern Renaissance portraiture,
history paintings, and landscape paintings. In this sense, he is of his time.

Many have associated Van Hoogstraten with the inductive reasoning common
in treatises of the Royal Society. However, in its fascination with method and
materials, his reasoning is not easily incorporated into the Baconian method.
In terms of depth perspective, the success of the rough style is measured by the
extent to which it resonates with the viewer’s potentially flawed memory of
similar objects. In Aristotle’s terms, the probable impossibility or the realistic
but optically imperfect painting is better than the improbable possibility of a
painstakingly accurate Dürer etching, Vermeer or de Hooch interior in which
objects diminish in perfect proportion to their distance from the viewer. In
the realm of optical illusions, the rough style succeeds if it invokes and elicits
the imagined sense of touch. The model is not Zeuxis and Parrhasius, but a
curiosity cabinet and a trompe l’oeil.

The problem with Van Hoogstraten’s logic, and therefore with Van de
Wetering’s application of it to Rembrandt, lies in the attempt to apply to Dutch
painting the principles of Venetian style. Similar problems characterize the
work of other critics. In a passage on landscape painting, Philip Sohm presents
the Italian view, interpreting a comment by Vasari that associates distance
with the rough style. Vasari concludes a passage in the Vite by noting: “‘Thus
the work when seen from a distance will appear finished but from nearby it
appears sketched (in bozze).’”\footnote{40} Sohm’s interpretation goes as follows:

Two conclusions may be drawn: (1) Both functions of sketched form, whether
to depict distant landscapes or to carry across a large space that separates
object from viewer, are illusionistic. Hence sketched form is seen in the
context of imitation of nature, not (as some seventeenth-century critics would
see it) as a beautiful form to be seen and appreciated from nearby and for
itself. (2) The “final finish” is not important for distant objects because it
cannot be seen, the implication being that if it could be seen, then it would be important. Instead priority is given to figures and the legibility of their poses and drapery.\textsuperscript{41}

In the depiction of foreground and depth, the goal is clarity: “just as clear form in nature looks sketchy at a distance, so too does distance render sketchy form clear.”\textsuperscript{42} He overlooks two other possibilities: when close to the picture plane, the rough style does not necessarily convey to the viewer “a beautiful form” but a neurological process. Second, in the case of a fascination with the properties of light, for example, in Rembrandt’s late religious works, it is not stark clarity but rough three-dimensionality that is the paradigm for the imitation of nature in a background or landscape. Hence, one does not have to depart from a model of imitation in order to entertain the possibility that visible brush strokes depict the play of light.

It is worth mentioning theories that occupy an intermediate position, claiming that line and texture are not the only means to convey depth. At least two critics have effectively argued that color precedes geometry as a way to convey volume and three-dimensionality. In Chapters VII and VIII of \textit{The Birth and Rebirth of Pictorial Space}, John White describes a variety of ways that late medieval and early Renaissance painters used color to depict distance.\textsuperscript{43} In “Giotto’s Joy,” printed in \textit{Calligram}, Julia Kristeva demonstrates that sequences of color can carry the line of vision into a painting, just as discordant color combinations can obscure the line of sight.\textsuperscript{44}

While justifying the rough style as an effective method of conveying the bare minimum schema of recognition (Bryson’s term, whereas Berkeley will use the phrase “minimum visibilia”), Van Hoogstraten, and following him, Van de Wetering, fail to take into account the contradictory effects sculpted paint might have on the depiction of objects in the foreground. According to the principles of Euclidean geometry as applied by Alberti, and more significantly, according to the observed effects of the \textit{camera obscura}, what is close to the picture plane should appear not only larger, but in greater detail than objects in the distance. Another major premise of Van Hoogstraten’s treatise is that rough brush strokes should convey not the precise dimensions of an object, but rather their image in the mind’s eye. These two premises—first that proximity should involve precision, and second that naturalistic imitation of light might involve broad and rough brush strokes—compete with one another. For example, if the paint is most sculpted in the depiction of objects closest to the picture plane, by Van Hoogstraten’s analysis, the artist may have been attempting to balance the principles of Euclidean geometry in Dürer’s sense, on the one hand, and, on the other, the rough and realistic style of painting nascent in Titian and coming into its own in late Rembrandt. Lack of verisimilar detail involves optical realism in representing the process of vision.

Brusati tells us that Van Hoogstraten himself used mechanical tools of optical precision in order to alter optics in favor of the mind’s eye’s distortions. In a perspective box, he used a candle to project images onto slanted and
putting a smooth wall of some sort of knotty wainscoting into your work will 
not be difficult, but will be a profitable and suitable means toward artistry. 
Here the playful young painter appears simply with ordinary objects colored 
from life and cut out around the edges, or with combs and letters, and takes 
delight in picturing something flat on a flat surface.\textsuperscript{45}

Significantly for an implicit comparison with Berkeley, Brusati mistranslates 
the phrase “knotty wainscoting.”\textsuperscript{46} The original Dutch has the phrase “\textit{quastig beschot},” which means a brush-like thing that one puts onto something else. The painter is to search his surroundings for something that appears already to have been painted. The successful \textit{trompe l’oeil} painter will choose this as the object of pictorial imitation. This passage reveals the material similarity between the object of imitation and its pictorial representation. The object made of paper, “cut out around the edges,” the reproductions of letters, and “something flat on a flat surface” call to mind the substance of the canvas itself. One recalls Svetlana Alpers’s observation of a “world … willfully painted” and Van de Wetering’s choice of Van Hoogstraten’s reference to the texture of paper.

Given the fascination with blindness in seventeenth- and eighteenth-century theories of perception (notably in Descartes, Locke, Berkeley, and Diderot), it is surprising that many present-day critics downplay the importance of the sense of touch. Fooling the eye is not simply a matter of vividness; it is a matter of texture. The issue is less verisimilitude than a double remove from representation. The question is whether Rembrandt and, for that matter, Vermeer painted what they imagined to be sculpted surfaces that were already made of paint. Furthermore, in Rembrandt and Vermeer, that which is doubled, the painted representation of paint, frequently appears as a series of white spots or blotches that demarcate rather than depict the play of light or the tendency of the eye to rest on the minimum schema or Gestalt. Examples
are the white spots that mark the luminosity of eyes in portraits, or the white marks that reveal glare on buildings or gems. Van Hoogstraten says that the true test of a trompe l’oeil picture is that viewers remain uncertain whether an object is part of a painting “until touch assures them that it is so.”

Norman Bryson’s foundational concept of the Essential Copy can be revised to incorporate the visibility of brush strokes. The result is more Aristotelian than Platonic. The early articulation of this theory in Vision and Painting goes as follows:

The picture of the world constructed within the painter’s perceptual consciousness is posited as the source of the image, subject to possible and further filtration by the schema’s performative intervention. This picture is not in any sense absolute, is not itself an Essential Copy of the world existing “out there” beyond the retinal bar, and for this reason the images made from the picture can never themselves be regarded as Essential Copies of the world in the style of the natural attitude. What the painter perceives is a construct derived from, but not identical to, the retinal stimuli arriving from outer reality, and the construct varies …. Perception is therefore an historically determined process ….

While his focus is social history of pictorial geometry, mine is the political history of pictorial style. Visible and palpable traces of work bring the viewers into the perceptual consciousness of the painter. The result is an Althusserian, collective consciousness. In seventeenth-century optical terms, George Berkeley provides a starting point for those interested in the locus of the shared perspective of a collectivity. The ideology of the physics, as opposed to the geometry, of the rough style associates manual labor with the most advanced scientific and philosophical findings reached by seventeenth-century theorists of optics.

**Keeping one’s distance: Luminosity and texture in Descartes, Van Hoogstraten, and Berkeley**

The Renaissance avocation of taxonomy spans realms and topics from sixteenth-century rhetorical treatises (Ramus, for example) to eighteenth-century scientific annotations, illustrations and catalogues. Although Berkeley’s seemingly heuristic concern for nomenclature lacks the rigor and expanse of Locke’s epistemological and ontological treatment of the limits of and the magnetism of the natural sign, A New Theory of Vision is about the problem of extending to the domain of vision the provenance of the sense of touch.

In referring to material reality in order to illustrate abstract (Locke, as interpreted by Berkeley) or complicated mechanical distinctions, optical theorists look to the realm of painting for examples, analogies, and allegories. These optical theorists are at once transfixed and threatened by the philosophical
provenance of the sense of touch. Metaphors and similes for the sense of touch begin as early as Horace, whose commonly misquoted doctrine of *ut pictura poesis* is founded on an awareness of depth perspective. Although this is common knowledge, it is nicely articulated in Van de Wetering:

> Horace’s sentence beginning with the famous words: “*Ut pictura poesis*” is devoted to this very subject: “A poem is like a picture: one strikes your fancy more, the nearer you stand; another, the farther away”, by which he meant that some poems are perfect in their details while other poems owe their perfection to their grand scope.

For Renaissance scholars of optics and painting, Horace’s remarks are of interest in the way they are applied and revised. Rembrandt told people to stand back in order to get the most out of the experience of viewing his paintings.

One might establish a teleology as opposed to a chronology of pictorial depth perspective that begins with Descartes’ observation that distances appear faint, Samuel van Hoogstraten’s claim that the illusion of proximity requires the successfully intricate deployment of vivid texture, Berkeley’s combination of these two theories in a geometrical proof that both extreme distance and close proximity appear indistinct or out of focus, and, finally, Rembrandt’s subtle distinction between the vivid and mimetic texture of smoothly painted objects (best exemplified with reference to Vermeer) and the vivid and anti-mimetic texture of paint itself. With these last two in mind, it is my contribution to Rembrandt studies to suggest that there are two phases to his late works. The first corresponds to the duality Van de Wetering finds in the distinction between highly textured foregrounds and smoothly painted backgrounds. In that case, texture has a one-to-one correspondence with depth. Examples of this phase would be many of the religious subjects of the middle period. In another, later phase, the objects in the foreground are sculpted while the background is painted rather roughly. Examples would be the 1658 *Self Portrait* in the Frick and the 1654 *Bathsheba* in the Louvre.

In Descartes’s *Optics*, the sense of touch is rightly understood as the avenue through which light waves reach the optic nerve. The three Cartesian indications of distance are the imagined tactile difference in position, shape and size of objects; the internal sensation of a shift in the size of the angle formed in binocular vision, and the strength of the movement of light hitting the optic nerves. Given a cross-section of nerves on the fund of the eye, so many circular points or nerve endings are reduced to an average of the distant, vast number of originating moving points on a reflective surface. The greater the distance, the fewer the originating points. The quality and texture of the ensuing image is something Descartes describes using an example from painting:

> the space occupied by each of these optic fibers must be considered as if it were only one point. And it is this which often makes it seem that a meadow which is painted an infinity of different colors will appear from a distance to be all white, or all blue; and why, generally, all bodies are seen less distinctly
at a distance than when they are near; and why, finally, the more of the space at the back of the eye which we can make the image of one single object occupy, the more distinctly it can be seen.30

The light-stimulated movement of the optic nerves is instantaneously translated into information about an object in touch-informed space. Each optical nerve is touched and transformed, becoming a literal representation of the average of dynamic beams of light. As in the work of Antoni van Leeuwenhoek and Margaret Cavendish, the aggregate or multitude of minutiae interact with one another in an allegory of representational democracy. In the case of Descartes, the visual result is the following: what is close will appear brighter or more vibrant due to the strength of the beams of light, but what is in the distance may revert to the aggregate representational brightness of what may have been a series of bright as well as muted shades of color. This was the received notion Van Hoogstraten sought to revise, arguing that vibrancy or uniformity of color in the foreground can manifest itself as vivid texture. An example in Rembrandt would be the viscous white paint that comprises the garment of the 1654 painting in the National Gallery, A Woman Bathing. Each fold of cloth gleams with a single streak of light. Whereas the exploration involved in examining a surface by hand is an interest Descartes and Van Hoogstraten have in common, they also share with Locke, Berkeley, and Diderot the fascination with the motion involved in sensation.

Descartes uses the narrative of the blind man in order to explain how the mind arranges objects in imagined space. In an allegory that is replicated in Berkeley, the mind is an eye that scans the horizon and can “carry,” “transfer,” or “turn its attention” toward an object.51 The French has “elle puisse transférer de là son attention,” “elle peut porter son attention,” and sometimes “peut porter son attention vers.”52 The perception of depth becomes a narrative with a double allegory, one that transforms thought into sight, and another that makes space into time. Against Descartes, one might argue that it is entirely possible for the attention of the mind to encompass the glance of the eye. As in the fictional narrative of the workings of light and the optic nerve, in Cartesian neurology, bodily movements do not coalesce with cognition; they precede it. Berkeley’s discussion of depth perspective is similar:

It is certain by experience that when we look at a near object with both eyes, according as it approaches or recedes from us, we alter the disposition of our eyes, by lessening or widening the interval between the pupils. This disposition or turn of the eyes is attended with a sensation, which seems to me to be that which in this case brings the idea of greater or lesser distance into the mind.53

Berkeley’s work shares with Descartes’s the association between the internal, neurological sensation and the visual perception of depth. In Descartes’s Optics, this connection vacillates between the early Renaissance aesthetic of the natural sign on the one hand, and the Empiricist doctrine of the arbitrary sign on the other. In contrast, the main thrust of Berkeley’s treatise A New
Theory of Vision emphasizes the learned and arbitrary nature of the association between the perception and the cognition of depth. The internal sensation of nerve movements accompanying the perception of depth bears no intrinsic relation to the comprehended fact of depth as such. What follows from the previous passage is the caveat:

Not that there is any natural or necessary connexion between the sensation we perceive by the turn of the eyes and greater or lesser distance, but because the mind has by constant experience found the different sensations corresponding to the different dispositions of the eyes to be attended each with a different degree of distance in the object, there has grown an habitual or customary connexion between those two sorts of ideas ....

For Berkeley, sensation and perception are related metonymically as contiguous but independent parts of the commonly misunderstood phenomenon of depth perception. In the eighteenth century, the theory of the arbitrary sign inverts the relative importance of painting and language, in treatises concerned with the sister arts. In Ekphrasis: The Illusion of the Natural Sign, Murray Krieger finds a “happy confusion” in Addison, “as he turns to defend the powers of the verbal art”.

The very arbitrariness of arbitrary signs carries with it a freedom from absolute fidelity, together with a freedom of response to them by the reader, that may well permit the imitation to outdo its object. By inverting the hierarchy of value between original object and imitation—a hierarchy inherent to mimetic theory—the hierarchy of value between natural and arbitrary sign is similarly inverted. The verbal medium of poetry is thereby elevated, since it is given the power to raise art above nature.

The rough style of painting exposes the arbitrariness in the link between vision and touch, and in this sense enacts a fascination with language common among theorists of ekphrasis. In Looking at the Overlooked and in The Consumption of Culture, 1600–1800: Image, Object, Text, this inversion is what John Brewer, Ann Bermingham, and others find in the luxuriousness of vases and tapestries in late seventeenth-century still-life paintings. Historians have identified a shift toward a notion of artifice as property. The medium of expression per se takes on increasing value as a new sensory realm emerges, that evoked by pure artifice. To the extent that Berkeley subordinates the sense of sight to the sense of touch, he prefigures the eighteenth-century tendency to isolate the real and imagined tactile quality of artistic production and reception.

In formulating a theory of depth perception, what Berkeley does not acknowledge is that both kinds of sensation—internal feelings of the movement of optical nerves and external manual sensations—are tactile. The failure to recognize this paradox leads to the conflation of possession and deixis. The result is a superimposition of images of what the hand can grasp and images of what exceeds the reach of the human hand. The sensation of internal organs is a special case that cannot be easily categorized even when
informed by the discoveries of anatomies of the late part of the seventeenth century. The opposition between external and internal touch is a fiction nascent in Descartes and emerging in Berkeley’s work as an unstable allegory for the posited semiotic relationship between sign and referent. Much in the spirit of the tradition Murray Krieger explores, Berkeley defines language as arbitrary, and subsequently figures sensation and perception as linguistic. While the two kinds of actual sensation are tactile, the two kinds of imagined sensation defy semiotic representation, and instead invite analogies with pictorial techniques that celebrate the arbitrariness of the connection between touch and vision. In Rembrandt, this connection is less represented than manifested in the sculpted foregrounds and the identity of the artificial objects as pure paint, or alternatively, as semiotic images of the way the eyes process light.

In describing mental images of vision and touch, the importance of distinguishing the sign from the referent quickly begins to fuel a concern for names that distinguish subtly dissimilar phenomena. What Berkeley overlooks is the inconsistency between speaking of sight and touch as sign and signification, and then speaking of them as different “species.” Real memories argue for contiguity of objects in three-dimensional space. One can have a real memory of the experience of looking at the moon, and a real memory of touching a sphere. Semiotics would argue, in contrast, for the figurative continuity of metaphors. The logic of representation undermines the effect of real memories: even a real experience is mediated by the measurable inequality between distant objects and their image in the mind. Berkeley fails to distinguish between semiotic and literal absence.

The resulting distinctions therefore delineate not merely aspects of the process of seeing, but go so far as to divide visible from tangible objects. Berkeley uses the term “visible object” to describe the mental image of a diminished, distant object; visible objects change as often as a person’s position changes. The “tangible object” is the impossibly objective measure of dimensions as this measure would be performed and felt by the hands. Note the use of the words “object” and “thing” in the following:

if we take a close and accurate view of things, it must be acknowledged that we never see and feel one and the same object. That which is seen is one thing, and that which is felt is another. If the visible figure and extension be not the same with the tangible figure and extension, we are not to infer that the same thing has diverse extensions. The true consequence is that the objects of sight and touch are two distinct things.

Outside of the realm of microscopy, what is seen is always, presumably, smaller than what is felt. Berkeley reifies sensation and perception by giving them the metaphorical term “object.” Strictly speaking, neither is an object with physical dimensions, and therefore, the two have more in common than Berkeley claims. Even in the determination of these fictions, each has a nascent pictorial quality. In the imagined geometry of A New Theory of Vision, visible objects are dynamic, mental images of the area a distant thing
would encompass, for example if its outline were traced on a translucent cloth close to the eyes of the viewer (my example). The visible object is, by definition, always already cut off from its physical origin. It is “still changing as you approach to, or recede from, the tangible object, it hath no fixed and determinate greatness.” If the visible object is used as a measure of size, then “there can be nothing steady and free from ambiguity spoken about [magnitude].” In contrast, some tangible objects can be felt and measured by human hands and tools, while others, such as the moon, significantly, cannot. The mental images of most tangible objects are subordinated to the inductive extrapolations gleaned from real sensory experiences.

**Rembrandt: Theorist of optics**

To the extent that the term “visible object” is an empty signifier that refers not to a real memory, but to the marker or placeholder of the necessarily imprecise and fictional quality of visual memory as well as the hidden workings of the optic nerve, it finds its analogy in the depiction of pure paint in the foreground of many of Rembrandt’s late works. As early as the 1630 *Jeremiah Lamenting the Destruction of Jerusalem* (in the Rijksmuseum), sculpted paint takes on impassioned and sometimes typological significance as that noted earlier in Didi-Huberman’s discussion of Fra Angelico. This painting anticipates the use of rough texture to show proximity in Rembrandt’s late works. It is common knowledge that the late works are done in the rough style. A particularly vivid description is the following by Mariët Westermann, describing the 1666 *Lucretia*:

> the painting’s pervasive melancholy and richly worked paint are closer to Titian’s late works, including several dark paintings of the rape of Lucretia. Rembrandt’s radical reduction of the story asks the viewer to contemplate her guiltless death. The colour scheme is restricted and the rawness of the paint—pasted on thickly where there is substance, dragged across bare ground in shadow—registers Lucretia’s pain.

In *Jeremiah*, visible brush strokes do not merely represent the turmoil of fire and chaos in the background. It is the comparison of foreground and background that the style achieves. In its uncanny technical similarity to the deployment of paint in the still-life portrayal of objects in the foreground, the visible manipulation of paint undermines the tragic pathos of Jeremiah’s lament. Thematically and compositionally, the painting sets Jeremiah apart, away from the destruction in mood and position. However, stylistically, the hem of his garment, his flesh, and his possessions are associated with the explosive and vengeful destruction he had hoped to prevent. To the extent that his frustration is indistinguishable from the downfall of the people, his remembered warning not only cannot have succeeded, but cannot have conveyed the necessary distinctions between Jeremiah’s inner, prophetic
anguish and the distant multitude's suffering, an externalized manifestation of what the Old Testament deems vice. In the sense that Rembrandt comes chronologically before but logically after Berkeley, the objects and figure in the foreground are not visible objects in Berkeley’s sense of the term. At this early point in Rembrandt’s career, the thick and palpable quality of paint is not used as a consistent illusion to represent depth. Even in denying the initial or founding relationship between the object seen and the object touched, Berkeley develops an internally consistent way of imagining depth perspective based on arbitrarily originating but dynamically inter-related, Albertian, mental images of diminishing size and fading brightness. No such internal consistency is possible in Rembrandt’s *Jeremiah*. At once, the rough style can show the effects of light in the foreground and can show the effects of diminishing clarity in the background. Rembrandt’s style addresses the tragic failure of lament.

The visible brush strokes in the portraits in the Norton Simon Museum follow an inverted logic common to portraits of the early and middle of Rembrandt’s career, beginning with the flicker of a break with Lievens. The 1634 *Portrait of a Woman* might function as a foil or contrast to the others, as it is painted in a relatively smooth style. Notably, however, the 1633 *Portrait of a Bearded Man in a Wide-Brimmed Hat*, as well as the 1658 *Titus*, illustrate a decision to show in clear focus the eyes while painting the face and garments in the rough style. In these cases, clarity is a mode of depicting importance.

Although Berkeley’s treatise rages against the tyranny of geometry in the history of optics, his geometrical claims are some of the most convincing. If for Descartes proximity is comparatively bright because forceful, and for Van Hoogstraten the foreground is relatively textured, if sometimes bold or dark, for Berkeley, distance cannot be ascertained with recourse to a continuum based on distinctness or focal points. However profound his acceptance of the fact that size appears to diminish as distance increases, Berkeley rejects received notions that associate clarity with proximity. It is this belief that is perhaps the most useful in articulating a philosophical connection to Rembrandt’s late style.

Objects of perception can appear indistinctly at close range and from a distance alike. Using a drawing to establish focal points for binocular as well as monocular vision, Berkeley concludes:

> Any radiating point is then distinctly seen when the rays proceeding from it are, by the refractive power of the crystalline, accurately reunited in the retina or fund of the eye: But if they are reunited, either before they arrive at the retina, or after they have passed it, then there is confused vision.\(^63\)

In a chiasmic reversal of the impossibility of touching objects in the extreme distance, this passage concerns the attempt to focus one’s eyes on an object at an exceedingly close range. Berkeley extends Descartes’s allegory of the eye as mind, catching himself:
The eye, or (to speak truly) the mind, perceiving only the confusion itself, without ever considering the cause from which it proceeds, doth constantly annex the same degree of distance to the same degree of confusion. Whether that confusion be occasioned by converging or by diverging rays it matters not.  

Converging rays characterize distance while excessively wide angles diverge around objects that are situated at a point that is closer than that at which the eyes can focus. The perception of confusion, itself, without attribution of cause, is something Rembrandt takes up in the Frick 1658 Self Portrait. Regarding the late works, Westermann says:

The heavy, expressively worked paint of Rembrandt's late moral narratives is calibrated to the themes it conjures. His last self-portraits owe much of their gravity to the dense and crusty character of this paint, which moulds an image of introspection. ... [T]hese paintings depend on their rough surfaces for their full effect.

One might take his analysis a step further. The style of the 1658 Self Portrait argues that the paint itself has taken up the brush. Rembrandt's right hand is made of the gestures of brush strokes and sculpting. His steady gaze is at once reassuring and accusing, his posture and clothing are regal, but he appears to be on the verge of falling. The foreground and background are equally indistinct, although the texture of the surface breaks out of the dimensions of the picture plane while the texture in the background smoothly recedes into obscurity. There is a sense that the viewer is not in the right place. This is one of the only self-portraits in which his eyes turn slightly to the side. If the viewer is in the position of artist, he or she can see Rembrandt from an angle from which he cannot see himself. The displacement of the gaze allows for the possibility that the rough style as animate, tangible object is what presents itself as the artist.

Simultaneously, the rough brushwork that characterizes the hand is a device that prefigures Berkeley's tactile optics, where the sensation of greater retinal movement is associated with proximity. When scanning the hands and garment, the viewer's gaze is forced to leap across broad spaces in a discontinuous motion. This movement contrasts with the slow, steady tracking involved in scanning the foreground's features and objects in paintings done smoothly. Visible brush strokes, then, are pure artifice in that they do not imitate the visible contours of a hand. However, the strokes of the brush comprise a realistic portrayal of the invisible, but none the less optical, tactile experience of vision as George Berkeley will come to understand and describe this process.

The founding gesture that divides sight from touch is not optical, but philosophical. If distance itself is "in its own nature imperceptible, yet it is perceived by sight," then something else, Berkeley concludes, must have made distance perceptible to the eyes: some helping cause, perhaps. It remains, therefore, that [distance] be brought into view by means of some other idea
that is itself immediately perceived in the act of vision.”

This logic elides the possibility that distance may be perceptible not in its nature, but in real, lived, experiential interactions that invoke distance or unfold in a temporal sequence in a given location, for example. In the insistence on a helping cause that is extrinsic to the origin, as in the concern with nomenclature and generic strata, the treatise is heavily and surprisingly Aristotelian. The sixteenth- and early seventeenth-century interest in efficient causality frequently includes references to vision. In On Efficient Causality, concerning an “agent” that “intends per se only an action on a remote thing and yet does not exercise that action except through a medium,” Francisco Suarez states: “a visible object does not diffuse its [sensible] species to the eye except through a medium.”

The theory carefully distinguishes quasi-autonomous or inter-dependent causality from causality that would in its entirety organically emanate from another source (material causality, for example):

it is not certain that it always acts on a distant thing through the nearby thing as through an instrument or power of acting, but instead it is probable that it sometimes acts immediately through its own proper power on the whole of some patient [passive agent] ….

Although Berkeley’s theory maintains a stark division between visible and tangible objects, the logic relies on the prominence of the sense of touch.

In the following passage, painting is the agent that communicates between the senses of sight and touch. The passage is doubly pictorial, first in the sense that the “tangible earth” is a backdrop, background, or canvas for the inverted, convex reflections in the retina. The empirical sense of touch is the way one knows which way is up. Berkeley begins with a question about the perceptual process of righting inverted images of visual sensation. In the retina:

The head, which is painted nearest the [external, tangible] earth, seems to be farthest from it: and on the other hand the feet, which are painted farthest from the [external, tangible] earth, are thought nearest to it …. The head which is seen seems farthest from the [tangible] earth which is seen; and the feet which are seen seem nearest to the earth, which is seen; and just so they are painted.

There is more than a little telling awkwardness to the metaphor wherein feet emerge from the hand (“on the other hand the feet”). The hand is generally the agent of touch. In this case, the man’s feet are touching the ground and it is only painting that temporarily turns the man upside-down:

How comes it that to the eye the visible [retinal image of the] head which is nearest the tangible [real] earth seems farthest from the [retinal image of the] earth, and the visible [or retinal image of the] feet, which are farthest from the tangible [real] earth, seem nearest the [retinal image of the] earth?

The conundrums and lightheartedness of this passage obscure the fact that the narrative is based on a presumed and unexplained cognitive connection
between real tactile and imagined visual information. There is no reason that the retinal image should right itself merely by using the sensory knowledge that one is standing on the ground. The efficient cause is a temporal modality articulated in the rough style in Rembrandt and in the “passive agent” in Suarez. The agent of action fails to emerge from the inner workings of the allegory. The story reveals the futile but compelling desire to bridge the gap between the realm of distanced, aesthetic observation and the domain of knowledge on the ground.

Notes


4 Ibid., 2.


6 Ibid., 151.

7 Ibid., 150.


11 Ibid.

12 Ibid., 361.

13 Ibid., 362.


15 Ibid., 146.

16 Ibid., 146–7.

17 Ibid., 37.

18 Ibid., 227.


23 Ibid., 164, 167.

24 Ibid., 163.

25 Ibid., 158.

26 Ibid., 183.

27 Ibid., 226–9; 170–73.


29 Ibid., 112–13.

30 Ibid., 189–90.

31 Ibid., 193.

32 Ibid., 200.


38 Ibid., 182–3.

39 Ibid., 183–4.

40 Vasari, quoted in Sohm, *PittoreSCO*, 44.

41 Ibid., 44–5.

42 Ibid., 44.


46 I am indebted to Dr. Eric Olaf Potma for this translation.


Van de Wetering, *Rembrandt*, 164


Ibid., 104–5.


Ibid.


Ibid.


Ibid., 189.

Ibid., 191.

Ibid.


Ibid., 183.


Ibid.


Ibid., 194.


Ibid.; retinal images would be inverted, hence my insertions.
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