TRECENTO VISUALITY AND THE VISUAL ARTS: THE ROLE OF GLASS AND THE INFLUENCE OF OPTICS ON ITALIAN ART OF THE FOURTEENTH CENTURY

by

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A dissertation submitted to the Graduate Faculty in Art History in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

2013

This manuscript has been read and accepted for the Graduate Faculty in Art History in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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Abstract

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This project explores several facets of Trecento visuality as related phenomena and argues that the theoretical and spiritual conceptions of vision were inextricably linked to developments in optical technology, the practical experience of vision, and the visual arts. It does so by elucidating the role of sight and light in private devotional practices by examining religious art, especially reliquaries, which incorporate transparent glass.

Early modern transparent glass had many functional uses—ranging from storage vessels to lenses, it was relatively cost-efficient, it was mentioned by ancient authors and natural scientists, and it was employed in religious symbolism. An examination of the many cultural associations that glass held in Trecento Italy demonstrates the ways a viewer used transparent glass in order to meditate their relationship with their world and their religious beliefs through their visual experiences and spiritual insights.

Acknowledgments

To my parents, Bryan and Susan Dillon; my grandparents, Robert and Patricia Dillon and Thomas and Marie Greene; and all my friends, family, classmates, students, colleagues, and professors who have brought me here. You have each contributed to and inspired this project in your own way.

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CHAPTER ONE

INTRODUCTION: VISION, VISUALITY, AND THE VISUAL ARTS

In his *Canticle of the Sun* from ca. 1226, St. Francis of Assisi wrote, "Praised be my Lord God with all his creatures, and specially our brother the sun, who brings us the day and who brings us the light; fair is he and shines with a very great splendor: O Lord, he signifies to us thee!"[1] St. Francis's esteem for the natural world has been described as a catalyst for the early Renaissance's burgeoning humanistic values, Aristotelian philosophy, penchant for visual information, and interest in naturalistic art. The confluence and growth of such trends has contributed to a narrative describing how early modern Italy moved away from the more abstract, metaphysical, and spiritual pursuits of the late medieval period towards the more earthly

[1] Paul Sabatier, *Life of St. Francis of Assisi,* trans. Louise Seymour Houghton (New York: Charles Scribner's Sons, 1914), 304-306.

and empirical ones of the Renaissance. Within this cultural shift from the scholastics to the humanists, the fourteenth century has traditionally been viewed as a period of transition, a messenger transmitting the recovered ideas of antiquity but not fully absorbing them, in large part due to the dramatic disruption caused by the Black Death. Consequently, fourteenth-century Italian art has not usually been credited with a deeply rooted scientific or philosophical underpinning. This study looks to revise this traditional approach by reevaluating some of the Trecento's most famous paintings, sculptures, and reliquaries containing glass within the context of contemporary optical theories, technologies, and symbolism, in order to reveal how Trecento visual arts resonated with and shaped Trecento visuality.

This project explores different facets of Trecento visuality, or socially-conditioned ways of seeing the world, as related phenomena and argues that the theoretical and spiritual conceptions of vision were inextricably linked to developments in optical technology and the practical experience of vision. It demonstrates how this interrelated network of cultural forces influenced both the production of the visual arts and their reception. Though some of these cultural trends have been studied in isolation or for other ends, this is the first study to link them and apply them to a study of Trecento art and visuality. Through analyses based on this approach, this investigation argues that Trecento artists employed several visual modes simultaneously to offer their viewers the most effective devotional tools possible. By extension, it suggests that the naturalistic style so characteristic of the Renaissance was not just the product of an autonomous artistic development, but also had strong connections to the increasing interest in the natural sciences.

This project follows the general models and research avenues provided by Michael Baxandall's "period eye" and Robert Nelson's investigation of visuality but it applies these

methods to fourteenth-century art of central Italy.[2] Further informing the present approach is Paul Hills's study of large-scale early Renaissance works within the context of the period's theories about light and vision.[3] However, unlike the work of Hills, the present investigation places greater focus on the role of sight and light in private devotional practices by examining reliquaries with visible relics.

Because of its interdisciplinary nature, this project consults the research of art historians such as Hayden Maginnis and Herbert Kessler but also draws from the work of historians of science such as David Lindberg and Vincent Ilardi.[4] To successfully integrate the artworks and optical knowledge within the social, epistemological, and religious mentalities of the Trecento, it draws from the methodologies of Katherine Tachau, Edward Peter Nolan, and Jeffrey Hamburger.[5]

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[2] Robert S. Nelson, ed., *Visuality Before and Beyond the Renaissance: Seeing as Others Saw* (Cambridge: Cambridge University Press, 2000), 1-15.

[3] Paul Hills, *The Light of Early Italian Painting* (New Haven, CT: Yale University Press, 1987), esp. 3-28, 64-71.

[4] Hayden Maginnis, *The World of the Early Sienese Painter* (University Park, PA: Pennsylvania State Press, 2001); Herbert Kessler, "Speculum," in *Speculum* 86 (2011): 1-41; Vincent Ilardi, *Renaissance Vision from Spectacles to Telescopes* (Philadelphia: American Philosophical Society, 2007); David Lindberg, *Theories of Vision from Al-Kindi to Kepler* (Chicago: University of Chicago Press, 1976).

[5] Katherine Tachau, *Vision and Certitude in the Age of Ockham: Optics, Epistemology and the Foundations of Semantics, 1250-1345* (Leiden: E.J. Brill, 1988); Edward Nolan, *Now Through a Glass Darkly: Specular Images of Being and Knowing from Virgil to Chaucer* (Ann Arbor, MI: University of Michigan Press, 1990); Jeffrey Hamburger, "Speculations on Speculation: Vision and Perception in the Theory and Practice of Mystical Devotion," in *Deutsche Mystik im abendländischen Zusammenhang: Neu erschlossene Texte, neue methodische Ansätze, neue theoretische Konzepte,* ed. Walter Haug and Wolfram Schneider-Lastin (Tübingen, 2000), 353-408.

Other important methodological models for this study include the work of Samuel Y. Edgerton and Alfred W. Crosby.[6] Edgerton's research has examined the ways optical theory contributed to fifteenth-century visuality and the development of linear perspective while Crosby assimilated research on a vast array of fields, including but not limited to record-keeping, music, literacy, and art, in order to argue that a rising interest in vision and quantifying the natural world began around the middle of the thirteenth century. What follows employs approaches similar to those of Edgerton and Crosby but it applies these models to a different subject—Trecento Italian devotional art—and with a greater interest in the specific role played by glass. To do so, it also draws from the ideas presented by Alan Macfarlane in *Glass: A World History*.[7]

When considering the role of glass in early modern artistic practice and theory, two types of glass dominate the discussion: the great Gothic tradition of stained glass and Alberti's window-as-metaphor used in the creation of linear perspective from the fifteenth century. While there is no doubt these were important cultural symbols and artistic moments, it could be argued that they have overshadowed the important roles played by glass in the intervening period. In fact, as the title suggests, Edgerton's latest work, *The Mirror, the Window, and the Telescope: How Renaissance Linear Perspective Changed our Vision of the Universe,* is concerned with thirteenth-century optical science primarily as it relates to the development of linear perspective in the fifteenth century. Though he briefly mentions Giotto, Edgerton omits a discussion about the ideas and art of the Trecento.

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[6] Samuel Y. Edgerton, *The Mirror, the Window, and the Telescope: How Linear Perspective Changed Our Vision of the Universe* (Ithaca, NY: Cornell University Press, 2009); Alfred W. Crosby, *The Measure of Reality: Quantification and Western Society, 1250-1600* (Cambridge: Cambridge University Press, 1997).

[7] Alan Macfarlane and Gerry Martin, *Glass: A World History* (Chicago: University of Chicago Press, 2002).

Looking to contribute to a more complete understanding of this period and its art, this study, then, explores the use of glass in Trecento devotional art alongside optical theory and technological advancements. It does not, however, explore this period for clues to later developments, but seeks to illuminate the fourteenth century on its own terms. To do this, it employs the methodology outlined by Pamela Smith, which calls for a simultaneous analysis of a culture's science, technology, and medicine with a firm foundation in the way individuals interacted with raw materials.[8] To that end, this study examines the raw material of glass in different formats and cultural fields.

Material culture studies, such as the work of Arjun Appadurai, establish that objects have value beyond their inherent material cost.[9] The significance of a commodity is informed by its exchange value as well as by other factors such as its utilitarian function, cultural associations, and symbolic value. In the words of Appadurai, commodities have "social lives."[10] When one considers the life of early modern glass, significant factors relevant to this project quickly emerge. Glass had many functional uses—ranging from storage vessels to lenses, it was relatively cost-efficient, it was mentioned by ancient authors and natural scientists, and it was employed in religious symbolism. As the following chapters argue, by interacting with glass in

[8] For more on what Smith calls *sci-tech-med,* see Pamela Smith, "Science on the Move: Recent Trends in the History of Early Modern Science," *Renaissance Quarterly* 62 no. 2 (Summer 2009): 247. Her assertion that one should begin a consideration of a culture's science by analyzing its interactions with raw materials was expressed at a roundtable discussion, Pamela Smith and others, "Roundtable Discussion: New Trends in the History of Renaissance Science and Medicine" (sponsored by The Renaissance Society of America, held at The Graduate Center, CUNY, New York, NY, October 19, 2012).

[9] Arjun Appadurai, "Introduction: Commodities and the Politics of Value," in his *The Social Life of Things: Commodities in Cultural Perspective* (Cambridge: Cambridge University Press, 1986), 3-63.

[10] Ibid., 3.

these various ways simultaneously, an early modern viewer's understanding of glass was mutually informed by the others. An examination of the social life of glass in Trecento Italy reveals ways a viewer used material objects such as transparent glass in order to mediate their relationship with their world and their religious beliefs through their visual experiences and spiritual insights.

The motivations for this study become evident when one considers the many ways in which vision and glass were changing at this time. Crosby describes a general shift from an oral world to a visual one, noting that by the later thirteenth century, "A society in which the chief conduit of authority was the ear, tilted to the somniferous repetition of myths and epics, began to become a society in which the recipient of light ruled: the eye."[11] Though Aristotle's theory of intromission had generally surpassed Plato's long-standing theory of extramission in the thirteenth century, an understanding of vision was still in flux in the following century. In the fourteenth century scholars continued to debate the merits of Plato's theory, which argued that one saw by means of rays extending from the eye, versus that of Aristotle, who promoted a system where images flooded into the eye. [12]

According to the Franciscan theologian St. Bonaventure (1221-74), the earthly world was a reflection of the heavenly realm; thus the nature of earthly vision was connected to its spiritual counterpart, divine insight. Therefore, not coincidentally, the fourteenth century also witnessed a

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[11] Crosby, *The Measure of Reality,* 133. Crosby discusses the increasing interest in vision within a larger cultural context characterized by a growing reliance on quantification. My project's case studies support the argument that artists responded to changes in optical technology and theory in new ways but I do not mean to suggest that other senses such as hearing or touch became less important as a result. Nor do I mean to suggest that vision was unimportant in the early middle ages or antiquity. Rather, my study's central aim is to explore the changing notions of vision and visuality and how these may have impacted the visual arts through examining the role played by transparent glass.

[12] Maginnis, *The World of the Early Sienese Painter*, 2.

great debate about the nature of the Beatific Vision, the moment when a believer would come into direct contact with the divine. In 1 Corinthians 13:12, St. Paul describes this moment, "For now we see through a glass, darkly; but then face to face: now I know in part; but then shall I know even as also I am known."[13] Paul's analogy of viewing God through a pane of glass while still on earth could have easily resonated with fourteenth-century Italians. Significant advancements in glass production and optical technology were making mirrors and the recently invented eyeglasses more readily available and capable of shaping one's daily visual experience in dramatic ways.

In order to examine the interrelatedness of Trecento optical theory, optical technology, spiritual belief, and the visual arts, this project focuses on Italian works of art that incorporated glass in various ways. The rationale for linking glass and optics stems from an etymological connection: the ancient term for glass, *vitrum,* derived from the verb *videre*, meaning "to see."[14] The relationship between glass and optics was further solidified in the twelfth century when an influential treatise on ophthalmology describing the eye as glass-like by Hunain, an Arabic scholar, physician, and translator, became widely available. In the midst of these optical investigations, art works began to feature glass more frequently.

Though not often recognized, probably because of their inability to photograph well and their medieval associations, many famous artworks of the fourteenth century incorporated stained glass, gold-backed glass, and transparent glass. Artists such as Duccio, Simone Martini,

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[13] Translation according to the King James Bible; the Revised Standard Edition substitutes "mirror" for "glass" but as mirrors are made of glass, the analysis is still applicable. For a discussion of the various translations see Edward Peter Nolan, "Introduction: The Cracked Looking Glass," in his *Now Through a Glass Darkly*, 1-13 and for more on the implications of this debate, see chapter 6.

[14] Ilardi, *Renaissance Vision*, 38.

and Taddeo Gaddi designed stained-glass windows. Sculptural works such as Nicola Pisano's pulpit in Siena cathedral and paintings such as Simone Martini's *Maestà* include inset panels of gold-backed glass. Many reliquaries incorporate clear glass as "relic windows" or integrate rock crystal vessels from the Levant. Furthermore, many of the most famous painters depicted glass objects such as mirrors, reading lenses, and eyeglasses in major public frescoes. Although scholars have largely neglected the cultural implications of the use of glass in early Renaissance art, an investigation of glass in the Trecento can help inform our understanding of the period's visuality and contribute to a more complete understanding of fourteenth-century Italian art.

The next chapter following this introduction addresses the history of glass production in general and includes a more detailed look at the different types of colored glass popular during the late medieval period, namely, enamel and stained glass. It considers how Italian Trecento artists adopted stained glass and finds that artists known primarily for their naturalistic painting styles (i.e., Duccio, Simone Martini, and Taddeo Gaddi) also worked with stained glass in ways that were uniquely suited to their immediate surroundings. For instance, it examines the interaction between Duccio's stained glass for the cathedral of Siena and his altarpiece for this same site, as well as the ways Taddeo Gaddi's windows for the Bardi chapel at Santa Croce resonated with the same artist's frescoes surrounding the windows. It finds that oftentimes, in situations where artists were working with stained glass, there were other references to glass present in various forms. For example, Simone Martini not only designed windows for his chapel of St. Martin in the Lower Church at San Francesco in Assisi, but also set gilded glass into his painted works and, in the same chapel as his stained-glass windows, Taddeo Gaddi painted a highly detailed and symbolically rich depiction of a transparent glass liturgical vessel in an illusionistic niche. Ultimately, this chapter argues that Trecento artists both learned from

previous glass traditions but also developed their own unique approach that was uniquely suited to their cultural and artistic context.

In the third chapter, the discussion shifts from colorful glass to an analysis of various types of gilded glass. Artists used gilded glass in several different visually striking ways throughout the late medieval and early Renaissance period. It was used in mosaics and cosmati work, and inlaid into paintings to create sharp, glittering reflections when hit by candlelight or sunlight. Like the previous chapter on colorful glass, this chapter identifies ways in which the fourteenth century was artistically linked to its past as well as moments of Trecento innovation. It illustrates how fourteenth-century artists capitalized on gilded glass's ability to produce glimmering, golden reflections that were particularly evocative symbols of the divine. However, it also examines what appears to be a specific adaptation of gilded glass, *verre églomisé,* that is, the process of inscribing imagery into a gold-leaf-backed panel of glass. It charts this medium's historical development and use in the late-thirteenth and fourteenth centuries by exploring the early modern development of this practice beginning with its use by Nicola Pisano in the late thirteenth century. The chapter then traces its use in the early fourteenth century by Simone Martini and ends with a discussion of late Trecento verre églomisé by Giovanni Fei and Lorenzo Monaco. Here, it situates the various uses of the medium within the context of artistic practices and visual theories and ultimately asserts that verre églomisé allowed the artist to combine naturalistic inscribed imagery with the powerful lighting effects of gilded glass in new ways; rather than painted figures of saints on a gold background, the medium of verre églomisé allowed artists to create images of holy figures that were composed of the symbolic gold light.

Chapter 4 explores how imported glass objects and technology from the Levant influenced glass production and the reception of glass and crystal works in the West. After the

1204 Sack of Constantinople, precious Byzantine and Islamic glass and crystal objects infiltrated Western artistic traditions, oftentimes as reliquaries either imported through trade or carried home by devout pilgrims as souvenirs from their trips to the Holy Land. Along with these objects made from glass and crystal, the Latin West was also importing methods of glass production and optical treatises. This chapter considers the interrelated nature of these phenomena and, by exploring the relationship between optical science, the growing interest in visible relics, and glass, suggests that the medieval West was significantly shaped by the artistic and intellectual climate of the Islamic East. The discussion begins with an overview of the complex relationship between the Italian peninsula and the Levant, using Venice as a case study. The chapter then describes the various ways glass objects from the East made their way into Europe as well as the developing glass industry in Italy. Finally, it addresses the associations and symbolic value of glass and crystal in both the Islamic East and Latin West.

Chapter 5 examines the many central Italian reliquaries from the Trecento that feature small, round glass windows, which functioned like monstrances and allowed one to view the relics directly. Through such examples as Naddo Ceccarelli's *Reliquary Tabernacle with Virgin and Child*, this chapter connects the physical process of vision to its spiritual counterpart by investigating the role of sight in relic worship. It does so by examining Trecento depictions of glass objects, such as mirrors, eyeglasses, and magnifying glasses, in public art and analyzing their cultural associations in order to demonstrate the prominence of optical imagery and its symbolism in the early modern consciousness. Some of the most famous artists of the Trecento working in the naturalistic style, such as Giotto and Ambrogio Lorenzetti, were the very same artists painting prominent optical devices within their frescoes and altarpieces. By situating the various types of glass that are represented in Trecento art and contextualizing them within the

technological developments and theology of the period, it is possible to chart some of the ways these cultural factors mutually informed one another.

Chapter 6 examines a group of Franciscan reliquaries from the later Trecento decorated with verre églomisé imagery. These reliquaries, which generally conform to a specific type and reflect a central workshop, feature a single sheet of glass with portions of verre églomisé and transparent glass on it. Because of the dual use of glass serving as both a "relic window" and a mirror, these devotional tools could simultaneously resonate with different optical theories in order to offer their viewers complex devotional tools. To gain a more complete understanding of the reception of these works, this chapter situates them within the Franciscan context by noting the order's many members who studied and wrote on the subjects of light and sight. Because of this order's strong penchant for optical theory, this chapter also suggests it may be helpful to consider the ways these reliquaries could have responded to more specific aspects of Trecento visual theory. Although there was a shift towards privileging the visual theory of Aristotle, Plato's theory still lingered. When analyzing the reliquaries with these theories in mind, it becomes possible to see the ways they could have responded to both simultaneously. The various properties of glass in these reliquaries also produced different lighting effects, another area of interest for Franciscans such as St. Bonaventure.

Finally, the concluding chapter summarizes the main claims of this study and points to further research avenues and questions. It argues that the Trecento was a cultural and artistic intersection between medieval and Renaissance aesthetics and, as such, embodied aspects of each. The Trecento reliquaries discussed in this chapter combine the glittering reflective surfaces found in earlier examples of gilded glass with panels of transparent glass that display relic fragments to the viewer and, in doing so, they draw from ideas presented in the preceding

chapters. In addition to responding to the various artistic sources and evidencing new combinations unique to their cultural contexts, they also resonated with shifting optical theories, changing notions of the eye and vision, theological interpretations, and technological innovations. By examining the various ways artists, theorists, and viewers used, interacted with, and conceptualized glass at this time, this study explores how the various uses of and associations with glass in the areas of science, technology, and art were mutually informing each other, and demonstrates that understanding these relationships provides new and important insights into the larger phenomenon of Trecento visuality.

CHAPTER TWO

TRECENTO ITALIAN STAINED GLASS

Although the most famous examples of stained-glass windows are found in French Gothic cathedrals in cities like Chartres and Paris, artists in Trecento Italy also made impressive use of this medium. Perhaps surprisingly, the Italian artists responsible for the design of the stained-glass windows in Siena's Cathedral (fig. 2.1), the Lower Church of San Francesco in Assisi (fig. 2.2), and Santa Croce in Florence (fig. 2.3) were none other than the artists responsible for the naturalistic paintings at these same locales: Duccio, Simone Martini, and Taddeo Gaddi. This chapter discusses these Italian stained-glass windows within the context of each artist's oeuvre and the artworks in their immediate surroundings in order to better understand Italian Trecento stained glass and the ways this art form resonated with contemporary visuality.

Though the main interest of this project is the significance of glass in Trecento art, it is important to consider earlier traditions of artistic glass in order to contextualize it. Therefore, before discussing Trecento stained glass, this chapter presents a brief overview of the history of glass and the various uses of glass in artistic production. Ultimately this chapter argues that, by gaining a sense of these artistic traditions and the ways they related to their cultural contexts, one can develop a model for the use of glass in the Trecento. Such an approach allows one to bridge what have been positioned as two distinct periods—the late medieval and early Renaissance—and their corresponding artistic approaches by highlighting their continuity rather than their differences.

This chapter builds from the scholarship on stained glass as well as that on medieval aesthetics, color, and gemstones. It juxtaposes the art-historical scholarship with the work of Hugh Tait and Alan Macfarlane on the history of glass in order to establish a larger context for the development of glass arts.[15] Finally, when turning to the specific works of Trecento stained glass, it was necessary to consult the work of Paul Hills and Diana Norman because these two scholars conducted comprehensive analyses of Taddeo Gaddi's chapel in Santa Croce that included a detailed consideration of the ways Taddeo's windows interacted with the rest of his decorative complex.[16] By building from this body of scholarship and applying its lessons to Trecento stained glass, this chapter lays the groundwork for the rest of the following chapters of this study. In so doing, it argues that Trecento artists were working within a network of glass—

[15] Alan Macfarlane, *Glass: A World History* (Chicago: University of Chicago, 2002); Hugh Tait, ed., *Five Thousand Years of Glass* (London: British Museum Press, 1991).

[16] Paul Hills, *The Light of Early Italian Painting* (New Haven, CT: Yale University Press, 1987), 75-86; Diana Norman, "Those Who Pay, Those Who Pray and Those Who Paint: Two Funerary Chapels," in her *Siena, Florence, and Padua: Art, Society and Religion: 1280-1400,* vol. 2 (New Haven, CT: Yale University Press, 1995), 169-179.

that is, a series of interlocked traditions of glass making, glass technology, and glass art—that simultaneously informed their artwork and their culture's visuality.

Ancient History of Glass

Before analyzing Trecento stained glass in more detail, it is necessary to establish an understanding of this medium from its ancient origins. Though it is not clear how the invention of glass happened, it is estimated that glass was first made around 2500 BCE in Mesopotamia.[17] The majority of the earliest intact glass vessels date to around 1500 BCE; at this time, glass objects were being produced using the core-formed technique both in Mesopotamia and Egypt.[18] Other early glass products included mosaic glass, glass beads, and glass inlays for jewelry or furniture made by casting the pieces in a mold.[19] As demonstrated by the *Glass Bottle from Ur* (fig. 2.4) made using the core-formed technique from ca. 1500 BCE and the *Eye Paint Container of Blue Glass* from ca. 1450 BCE (fig. 2.5) made using a mold, the oldest extant glass vessels were made of opaque colored glass.[20]

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[17] Macfarlane, *Glass*, 10; Tait, *Five Thousand Years of Glass*, 21; Anne Friedberg, *The Virtual Window* (Cambridge, MA: MIT Press, 2006), 107.

[18] Tait, *Five Thousand Years of Glass*, 22; Friedberg, *The Virtual Window*, 107. For more specific information on the spread from Mesopotamia to Egypt, see Tait, *Five Thousand Years of Glass,* 24-26 where Tait suggests that it was the Syrian conquests of Tuthmosis III that inspired the production of the earliest Egyptian glass vessels.

[19] Tait, *Five Thousand Years of Glass*, 23.

[20] Macfarlane, *Glass*, 11-12; Tait, *Five Thousand Years of Glass*, 22, 33-34. For detailed step-by-step instructions of the core-formed technique and photographs of each stage in the process from a modern recreation see ibid., 214-215.

As would be the case with glass throughout much of its history, the shapes, functionality, and colors of the earliest glass objects indicate that these objects imitated other materials, primarily precious stones or minerals.[21] For example, the shape, color, and function of the *Eye Paint Container of Blue Glass* replicated a cosmetic jar commonly made of blue stone that was widely produced about five hundred years earlier.[22] There were also extant bowls and plates made in imitation of metal prototypes through a process of casting and grinding.[23]

Greek glass production, though slow at first, reached a peak during the Classical and Hellenistic periods and in many ways followed a similar pattern to that found in Egypt. Not many glass vessels have been recovered from Mycenaean Greece and the few objects that have been found suggest that, at this time, Greece did not have its own glass-production centers but rather imported premade glass from Egypt.[24] Most of the objects, which mainly consist of pendant-like ornaments and small figures dating from ca. 1300, were made from a bright, translucent blue glass that matched the chemical composition of contemporaneous Egyptian glass.[25]

Glass production in Classical and Hellenistic Greece grew and emulated the Egyptian model in terms of technique and products until about the third century BCE. Burial finds indicate that early Greek glass objects were brightly colored vials with small openings used for the storage of perfume that were made using the core-formed technique and meant to imitate

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[21] Ibid., 23 and 28.

[22] Ibid., 34.

[23] Jennifer Price, "Glass," in *A Handbook of Roman Art,* ed. Martin Henig (London and New York: Phaidon Press, 2006), 205.

[24] Tait, *Five Thousand Years of Glass*, 24-26.

[25] Ibid., 24-25.

more precious materials.[26] By the mid-third century BCE, a more characteristically Greek glass industry had developed. Craftsmen developed new techniques such as network glass and mosaic glass, the latter of which was often used to make plates or bowls by fusing together many multicolored canes to form a complex and intricate spiral pattern (fig. 2.6).[27] It is also at this time that clear glass and gold sandwich glass developed, a topic treated more in more detail in chapter 3.[28]

It was in imperial Rome where glass production, of both colored and transparent glass, reached its zenith.[29] Glass was used in a variety of different ways in ancient Rome; it was fashioned into expensive luxury items like jewelry and lavish furniture inlays and used for household utilitarian storage containers, windows, and mirrors.[30] The Romans could create a vast range of objects because they had many different methods of working with glass available to them. The most revolutionary technique used in the production of ancient Roman glass was the blown-glass technique, which was developed near Syria in the first century BCE.[31] The Roman glass industry flourished as craftsmen refined the techniques of blowing, painting, engraving,

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[26] Price, "Glass," 205.

[27] Tait, *Five Thousand Years of Glass,* 48.

[28] Ibid., 49. For more details on the other types of developments at this time see ibid., 50-61.

[29] As Price notes in "Glass," 205, during Roman times glass "exerted a greater influence on daily life than at any other period before the Renaissance." As Macfarlane, *Glass*, 13, notes, "Roman glass technology was in many ways unrivalled until the nineteenth century."

[30] Macfarlane, *Glass*, 15-16; Friedberg, *The Virtual Window*, 107 notes that Roman window panes "were thick and greenish-blue and produced in disks no larger than six to eight inches wide."

[31] Macfarlane, *Glass*, 13; Price, "Glass," 205-207.

gilding, and casting glass and, in so doing, provided long-lasting inspiration for the re-emergence of the glass industry in the Levant and the Latin West.[32]

The Byzantine and Islamic glass-making centers in the east preserved the Roman knowledge base and cultivated their own innovations. Their fine luxury products, particularly lamps and "perfume jars," became highly valued commodities on the trade circuits, but these glass objects could also take on special religious significance, as seen in the case of the so-called pilgrim flasks. As will be discussed in chapter 4, one of the main ways these glass bottles entered the Latin West was as reliquaries carried home from the Holy Land by spiritual pilgrims. The importation and inspiration of such objects, along with the import of cullet—pieces of broken glass that could be melted down and refashioned into new objects—as well as the arrival of glassworkers from the east, dramatically re-energized the production of glass in the west.

After the fall of Rome, glass production in the west had slowed considerably, but it did not, as has sometimes been deduced from the archeological evidence, die out entirely.[33] Alan Macfarlane observed that, although few glass vessels or objects have been found in Europe dating from the early medieval period, there are other explanations for this shortage. Macfarlane noted that many of the find spots of earlier objects came from burials but, with the rise of Christianity, objects were not interred in burials and thus a good method of preservation was lost.[34] Other explanations for the lack of early medieval glass include the fact it was now being

[32] The influence of Roman gold glass on later medieval glass is discussed further in chapter 3.

[33] Macfarlane, *Glass*, 19-21.

[34] Ibid., 17.

melted down and reused and that its composition, which now included potash from woodland plants rather than from sea plants, was more prone to decay.[35]

As will be discussed in chapter 4, one of the strongest and longest traditions in the Latin West was centered on Venice. Venetian glass reached its peak in the Renaissance period but it was already flourishing in the thirteenth century due to close connections with the Levant.[36] For now, it is important to note that the Latin West did have a continuous glass industry that underwent many changes and developed into their own tradition.

Stained Glass and Enamel in Medieval Europe

Glass vessels produced in medieval Europe included a variety of formats but the two types of artistic glass that arguably contributed to the greatest impact on the medieval aesthetic were stained-glass windows and enamel works. The enameling technique had a long history. Extant enamel works date as far back as the second millennium BCE.[37] Several variations on this technique were available during the medieval period, the main two of which were cloisonné and champlevé.[38] In both these types of enameling, colored glass was cast, pulverized into powder,

[35] Ibid., 18.

[36] Ibid., 21.

[37] Janetta Rebold Benton, *Materials, Methods, and Masterpieces of Medieval Art* (Oxford: Praeger, 2009), 149.

[38] Other variations on these techniques include bass-taille, plique-à-jour, and émail en ronde-bosse. For more on this see Benton, *Materials, Methods, and Masterpieces*, 153-55.

poured into compartments, and fired.[39] After firing, the melted glass adhered to the artwork and its grains fused to form a glossy, richly colored, jewel-like texture.[40]

Cloisonné is thought to have been originally developed and perfected by Byzantine artists and made its way to the West by at least the fifth century.[41] Instructions for making cloisonné were included in the medieval treatise *On Divers Arts* attributed to the twelfth-century German Benedictine monk, Theophilus.[42] Cloisonné required one to create a series of small compartments with walls made from small strips of gold, fill each cavity with the appropriate color of glass powder, and fire the work to solidify the vitreous powder.[43] The two small reliquary triptychs at the center of the *Stavelot Triptych* (fig. 2.7) are important examples of this technique because they featured this technique's characteristic style and were used for the decoration of prized religious objects. These objects also mirrored the journey of the technique, that is, migrating from the Levant to the Latin West.[44] In each reliquary, the cloisonné figures featured bright colors, prominent gold outlines, and reflective surfaces. Finally, as was the case

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[39] Ibid., 151.

[40] Though the aesthetic of both cloisonné and champlevé are very different from stained glass and gilded glass, enamel works are included here because they required the same firing process as other types of glass and therefore I argue that they were part of a larger network of glass.

[41] Benton, *Materials, Methods, and Masterpieces,* 151.

[42] For more on the attribution and the various extant editions of this work see Theophilus, *On Divers Arts,* trans. John G. Hawthorne and Cyril Stanley Smith (New York: Dover Publications, Inc., 1979), xv-xxxv.

[43] Ibid., 126-27.

[44] Joyce Brodsky, "The Stavelot Triptych: Notes on a Mosan Work," *Gesta* 11 (1972): 31; William Voelkle, *The Stavelot Triptych: Mosan Art and the Legend of the True Cross* (New York: Oxford University Press, 1980), 20 on the Stavelot Triptych and the Byzantine nature of these smaller triptychs.

with many other luxury art forms, both triptychs in the *Stavelot Triptych* were used to decorate holy relics.

The second-most popular type of enamel in medieval Europe, champlevé, was primarily produced at and has since become associated with two main stylistic schools based in the Limoges and Mosan regions. As with cloisonné, champlevé was commonly used to decorate reliquaries. The characteristic features of the Limoges style are found in works such as the Metropolitan Museum of Art's *Chasse with the Crucifixion and Christ in Majesty* (fig. 2.8), while the six roundels flanking the center panel of the *Stavelot Triptych* (fig. 2.7) exemplify the style of the Mosan School. In both the Limoges and Mosan styles, the pulverized glass was poured into cavities that had been carved into the metal's surface. Because the compartments were indented, the metal on which the artist worked needed to be very thick. As gold was very expensive, champlevé was usually made using gilded brass or bronze rather than gold. Similar to cloisonné, the entire object was then heated until the glass and color fused into a consistent texture that created a jewel-like appearance.

As previously mentioned, the practice of using the comparatively economical medium of glass to emulate more rare and expensive gems did not originate in the medieval West. Like the origins of glass, it too had ancient beginnings. One of the most compelling reasons to imitate gemstones was that, in addition to the beauty of their luminosity and rich colors, gemstones were imbued with miraculous or protective powers. The medieval view that gems and precious materials held virtuous qualities had existed at least since the time of the ancient Greeks when Theophrastus, writing in the fourth century BCE, described the properties of stones and gems in *On Stones* (*De lapidibus*).[45] In one instance particularly relevant to the optical interests of this

study, he noted that *smaragdos*, or emerald, is "good for the eyes, and for this reason people carry seals made of it, so as to see better."[46]

Pliny the Elder's *Natural History* transmitted Theophrastus's ideas to the medieval West. In this text, Pliny detailed the many functions of minerals known in ancient Rome. Stones offered a variety of remedies; they offered protection from harm by warding off evil or, when ground up and ingested, they could alleviate pain from injuries such as scorpion bites.[47] Like Pliny, Dioskorides, writing in the first century CE, also outlined the medicinal properties of stones in his *Materia medica*.[48] In a similar vein, another famous ancient Greco-Roman source, the *Magic Papyri*, conveyed the great power of stones and the steps required for their activation.[49]

The apotropaic qualities of gems and jewels were passed down from the ancients to the medieval Christians. Later writers on the nature and power of stones and minerals included Marbode (1035-1122) and Albertus Magnus (c. 1206-1280). Albertus's lapidary was particularly comprehensive in its treatment of minerals and notable for his explanation of their properties in relation to one of the four humors.[50] Although Albertus was careful to point out that stones were not living entities, he did emphasize that they were still very powerful on a

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[45] Theophrastus, *On Stones*, trans. Earle Radcliffe Caley and John F. C. Richards, Graduate School Monographs no. 1 (Columbus, OH: Ohio State University, 1956).

[46] Ibid., 50.

[47] Dimitris Plantzos, *Hellenistic Engraved Gems* (New York: Clarendon Press, 1997), 110.

[48] Ibid.

[49] Ibid., 32.

[50] Spike Bucklow, "The Virtues of Imitation: Gems, Cameos, and Glass Imitations," in *The Westminster Retable: History, Technique, Conservation,* ed. Paul Binski and Ann Massing (Cambridge: University of Cambridge, 2009), 143.

variety of different levels. Some minerals could protect one from thieves while another type could bring the thief good fortune while conducting a robbery. Some stones functioned as a form of birth control while others ensured a healthy pregnancy. Still other types of stones could be used as a truth serum, an aphrodisiac, or a sedative.[51] Cameos made from onyx were said to promote dreams when put under one's pillow.[52]

Glass imitations of precious gems may have offered similar benefits. Based on the fact that lapidaries of the thirteenth century indicate that the powers of stones were related to their colors, Spike Bucklow extends the powerful associations of the gems to colored-glass imitation of gems.[53] In such a situation, red glass could have served as surrogate for ruby, green glass for emeralds, and so on.[54] For instance, when referring to the blue glass in his windows, Abbot Suger referred to them as "sapphire glass."[55] Supporting the privileged place of glass is the fact that it is mentioned alongside gems in the description of Heavenly Jerusalem from Revelations 21: 9-21, which was well known during the Middle Ages:

> One of the seven angels who had the seven bowls full of the seven last plagues came and said to me, "Come, I will show you the bride, the wife of the Lamb." And he carried me away in the Spirit to a mountain great and high, and showed me the Holy City, Jerusalem, coming down out of heaven from God. It shone with the glory of God, and its brilliance was like that of a very precious jewel, like a jasper, clear as crystal. It had a great, high wall with twelve gates, and with twelve angels at the gates. On the gates were written the names of the

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[51] On Albertus Magnus's summary of the properties of minerals see John M. Riddle and James A. Mulholland, "Albert on Stones and Minerals," in *Albertus Magnus and the Sciences* (Toronto: Pontifical Institute of Mediaeval Studies, 1980), 209.

[52] Bucklow, "The Virtues of Imitation," 143.

[53] Ibid.

[54] Ibid., 143-144.

[55] Erwin Panofsky, *Abbot Suger on the Abbey Church of St.-Denis and its Art Treasures* (Princeton, NJ: Princeton University Press, 1979), 53 and 77.

> twelve tribes of Israel. There were three gates on the east, three on the north, three on the south and three on the west. The wall of the city had twelve foundations, and on them were the names of the twelve apostles of the Lamb.
>
> The angel who talked with me had a measuring rod of gold to measure the city, its gates and its walls. The city was laid out like a square, as long as it was wide. He measured the city with the rod and found it to be 12,000 stadia in length, and as wide and high as it is long. The angel measured the wall using human measurement, and it was 144 cubits thick. The wall was made of jasper, and the city of pure gold, as pure as glass. The foundations of the city walls were decorated with every kind of precious stone. The first foundation was jasper, the second sapphire, the third agate, the fourth emerald, the fifth onyx, the sixth ruby, the seventh chrysolite, the eighth beryl, the ninth topaz, the tenth turquoise, the eleventh jacinth, and the twelfth amethyst. The twelve gates were twelve pearls, each gate made of a single pearl. The great street of the city was of gold, as pure as transparent glass.

Thus, for the medieval Christian, the Bible added yet another layer of positive meaning to gems, glass, and precious minerals. Evident in this description is the fact that gems, gold, and glass were worthy of a place in heaven and therefore should be highly valued on earth. Thus, the powerful associations with gemstones certainly would have imbued artworks featuring them—or imitations of them using glass—with great value and prestige.

In addition to the protective powers of gems and, by extension, colored glass, there were other reasons that such colorful objects were valued: their inherent beauty and their ability to symbolize the divine. Thomas Aquinas wrote, "things are called beautiful which have a bright color."[56] Like Aquinas, Abbot Suger also appreciated things colorful and bright. In writing about his renovations of the church at Saint-Denis, Suger noted that

> the loveliness of the many-colored gems has called me away from external cares, and worthy meditation has induced me to reflect, transferring that which is material to that which is immaterial, on the diversity of the sacred virtues: then it seems to me that I see myself dwelling, as it were, in some strange region of the universe which neither exists entirely in the slime of the earth nor entirely in the purity of Heaven; and that, by the grace of God, I can be

[56] Bucklow, "The Virtues of Imitation," 98.

> transported from this inferior to that higher world in an anagogical manner.[57]

For Suger, then, the colorful gems and stained-glass windows were certainly more than simply beautiful; they were transcendental.[58] They were also gifts from God. As Suger noted elsewhere, "For the most liberal Lord Who, among other greater things, has also provided the makers of the marvelous windows, a rich supply of sapphire glass, and ready funds of about seven hundred pounds or more will not suffer that there be a lack of means for the completion of the work. For He is *the beginning and the ending*."[59]

The use of stained glass for the decoration of church windows may have started as early as the fifth century but it was the Benedictine order that actively made glass and used it in their church windows to evoke a sacred setting symbolic of the divine.[60] Glass windows were later embraced by Suger and then brought to their full potential at the great Gothic churches such as Chartres Cathedral and Sainte-Chapelle.

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[57] Panofsky, *Abbot Suger,* 63-65.

[58] This idea was inspired by the writing of Pseudo-Dionysus, who Suger mistakenly believed was St. Denis. For more on this see Paul Rorem, *Pseudo-Dionysius: A Commentary on the Texts and an Introduction to their Influence* (Oxford: Oxford University Press, 1993); idem, *Pseudo-Dionysius: The Complete Works* (New York: Paulist Press, 1987).

[59] Erwin Panofsky, *Abbot Suger,* 53. Italics are Panofsky's.

[60] Macfarlane, *Glass*, 20 for early history of windows in Latin churches and the role of the Benedictines.

Trecento Stained Glass: Duccio, Simone Martini, and Taddeo Gaddi

Perhaps because enameling had become a "brand name" of sorts associated with Limoges and Mosan, the Italian Trecento artists did not emulate this technique in the way they adopted the colorful stained-glass windows. What follows includes an analysis of the earliest Italian stained-glass windows, designed by Duccio, Simone Martini, and Taddeo Gaddi. That such artists known for their naturalistic painting styles and narrative innovations worked with the medium of stained glass indicates two major points. Firstly, the boundaries between media as diverse as panel painting, fresco painting, and stained glass were fluid. Secondly, it demonstrates that the resulting differences between Italian stained glass and that of northern Europe stemmed from a different artistic approach.

Duccio's rose window depicting the *Assumption of the Virgin* (fig. 2.1) and other scenes for the choir of the cathedral of Siena from ca. 1287-88 is the first stained-glass window designed by an Italian painter and it serves as a good illustration of how the Italian artists both adopted the medium but modified it to their more painterly style.[61] Unlike the rose windows found at Chartres Cathedral (fig. 2.9) or Sainte-Chapelle (fig. 2.10), the window is not dominated by the tracery radiating out from the center in a leaf-like pattern, but rather, the circular space is divided into registers and frames in a manner similar to the walls of Giotto's Arena Chapel or the panels in Duccio's own *Maestà* altarpiece. In Duccio's window, the figures occupy the majority of the space and the lead tracery within the scenes primarily serves as the contour lines of the figures and background patterns. In other words, in this window, the medium of stained glass was bent to the motives of the painter rather than the reverse.

[61] Diana Norman, *Painting in Late Medieval and Renaissance Siena: 1260-1555* (New Haven, CT: Yale University Press, 2003), 76. The windows at San Francesco in Assisi predated the window in Siena but these were designed by German artists around ca. 1250; see John White, *Art and Architecture in Italy: 1250-1400* (New Haven, CT: Yale University Press, 1993), 184.

Less than twenty years later, Duccio painted the *Maestà*, a massive polyptych for the high altar of the same cathedral (fig. 2.11), just below his window. When undertaking this project, the artist would have certainly realized the potential for a dialogue between his two masterpieces. The rich colors and prominent Marian imagery in the panel painting mirrored the window's colorful light and iconography. On bright days, the light from the window could have flowed into the church, illuminating the colors of the polyptych's rear face and reflecting in all directions off the gilded portions of the frame. The iconography of the window and the front face of the altarpiece also created a sense of a conversation between the works. The window depicted more supernatural scenes such as the Assumption, Coronation, and Dormition along with saints and evangelists in glowing colorful glass while down below on the high altar, the painted panel presented a more earthly version of the Madonna as queen and mother rendered in more naturalistic modeling and with a more defined sense of space.

Another form of dialogue, central to the thesis of this project, also existed between Duccio's window and his altarpiece: both incorporated glass. Though Duccio's panel did not use actual panels of glass, throughout the decoration of the Virgin's throne he painted cosmati work (fig. 2.12), a type of decorated glass inlay that is discussed in chapter 3. A possible inspiration for such a throne would not have been hard to find. As will be discussed in greater detail in chapter 3, in the same cathedral one would have found Nicola Pisano's marble pulpit with some of the earliest Italian gilded glass incorporated into the spandrels below the sculptural reliefs, and there were examples of cosmati work in tombs and ciboria throughout Italy. In addition to the depiction of glass inlays in the Virgin's throne, Duccio's *Maestà* also depicted transparent glass vessels in the scene of the Last Supper (fig. 2.13). The apostles drink their red wine from transparent glass cups, likely in imitation of actual cultural practice. The production of such

glasses was a relatively recent development in glassmaking technology, which will be discussed in greater detail in chapter 5.

Though these connections on their own do not effect a monumental shift in our conception of Duccio's artistic production, they do become more informative when situated alongside the increasing use of glass by artists, which will be discussed throughout this study. As mentioned, this study looks to connect the increasing production of transparent glass and optical devices made from it discussed in chapter 5 and the various applications of glass to reliquaries with visible relics addressed in chapter 6.

The stained-glass windows designed by Simone Martini for his chapel dedicated to St. Martin in the Lower Church of San Francesco in Assisi (fig. 2.2) illustrate another case where a famous Italian painter designed stained-glass windows. As with Duccio's window and altarpiece in Siena's Cathedral—which Simone certainly would have seen as he lived and worked in Siena—Simone's windows were in conversation with his frescoes showing scenes of the life of St. Martin. Also like Duccio's window, Simone's composition strives for clarity of form within the stained glass medium.[62] His use of color, especially the alternating red and blue backgrounds and yellow frames, contributes to a sense of overall legibility in the windows.

Unlike the situation at Siena Cathedral, however, Simone's windows and paintings were part of the same decorative program and confined to a small chapel rather than spread across the interior of a large church (fig. 2.14). Because of the more intimate relationship between Simone's windows and frescoes, it is possible to analyze them together as a coherent unit. Such a reading suggests that Simone cultivated connections between his windows and the surrounding space to create a sense of unified space. To begin, Simone integrated the actual light from the

[62] White, *Art and Architecture,* 361.

windows into his pictorial world by illuminating the saints to either side as if they were lit by the window's light. Further linking his glass designs and those in the frescoes, Simone echoed the lancet shape of the actual windows (fig. 2.2) in the chapel's painted decorations in scenes such as the *Funeral of St. Martin* (fig. 2.15). Another prominent use of the lancet shape is found on the underside of the entry arch, where standing saints seem to almost converse with the viewers entering the chapel (fig. 2.16). These painted saints in the entry serve as pendants to the saints depicted in the windows; in each case, both the painted and stained glass, individual saints stand within a decorative frame and gesture to each other or the viewer.

However, an important difference may suggest there were two different conceptions behind the painted saints versus the stained-glass ones. The saints in the windows (fig. 2.17) do not look out at the viewer; their gazes are kept firmly within the confines of the window's space. It is as if their attitude and the glowing, supernatural light of the windows signaled that these figures were not as accessible as the painted saints in the archway. The physical location of the saints in the chapel reinforced this; the viewer would have had the opportunity to stand directly under the painted saints but the stained-glass ones were set behind the altarpiece and out of reach. However, not all the figures depicted in the windows face inward. In fact, the angels at the top of the two lancets stare straight out into the chapel's space (fig. 2.18). Yet, these militant angels do not engage with the viewers in order to offer comfort or their services as intercessors like the painted saints; rather, they hold swords and shields indicating their role as guardians of the divine realm. Their bright yellow shields glow in the dark chapel, evoking the sense of glaring reflections bouncing off their polished metal.

Another way in which Simone's windows related to their surroundings is their iconographical relationship. The scenes to the right of the windows (fig. 2.19), namely, *St.*

Martin and the Miraculous Mass and *The Knighting of St. Martin*, both feature St. Martin praying while he gestures up and to the left. In other words, in both scenes, Martin prominently gazes in the direction of the stained-glass windows as he looks for divine inspiration. These scenes seem to demonstrate Martin's deep connection to the divine through his ability to see beyond his painted reality to the colorful light of the windows and the symbolic presence of God they represent.

The scenes to the left of the stained-glass windows as one faces the windows (fig. 2.20) evoke a similar relationship to those on the right. Opposite the scenes of Martin praying to God are two scenes where Martin is about to receive divine insight. In the upper register Simone painted St. Martin enwrapped in a meditation so deep that his acolyte must physically interrupt it so the bishop can perform mass. In the lower register Christ, wearing the cloak that Martin had earlier given to a beggar, visited Martin in a dream and confirmed that Martin's charitable gesture had not gone unnoticed. Both these scenes feature Martin in an altered state ready to receive divine insight. By situating Martin towards the left of each composition, Simone made the connection between the windows' light and the saint even more explicit. Therefore, in the scenes to the right of the windows, Simone showed Martin praying to God and asking for inspiration, while the frescoes to the left depicted him receiving divine wisdom. It is as if the windows and their lighting were integrated into the painted program in a way that acknowledged the windows' light as symbolic of the divine presence.

It is important to take note of the ways Simone's decorative complex at Assisi was part of a larger network of glass, that is, to contextualize Simone's stained-glass windows within the artist's other uses of or references to glass objects. Prior to his work on the Chapel of St. Martin, Simone had completed his fresco of the *Maestà* in the Palazzo Pubblico in Siena. As is

discussed in chapter 3, Simone strategically set approximately 25 pieces of gilded glass into the plaster to enhance the lighting effects of his painting. He also used a glass roundel to embellish his panel of St. Louis of Toulouse, which was roughly contemporary to the chapel. Also, set into the ceiling of the Lower Church were pieces of glass backed with silver meant to resemble stars in the night sky. Every time Simone went to work on his chapel dedicated to St. Martin, he would have passed under them. Though Simone was not responsible for making or designing these panels of glass, it is apparent that he took note of them because he reproduced the appearance of the Lower Church's ceiling in the depiction of *The Funeral of St. Martin* (fig. 2.15) and *St. Martin* and *the Miraculous Mass* (2.19b).

As demonstrated by the cases of Duccio and Simone, the Italian use of stained glass could be integrated into the surrounding decorative program, crossing boundaries between media. Nowhere is this more fully realized than in Taddeo Gaddi's Baroncelli Chapel in Santa Croce of Florence (fig. 2.21). The Baroncelli family commissioned this burial chapel in honor of the Virgin Mary and the decoration throughout celebrates her. The frescoes on the walls depict various aspects of her life while the painted altarpiece commemorates her coronation and the sculptures positioned at the entry portal reenact the Annunciation.

Paul Hills and Diana Norman describe the many ways in which Taddeo's chapel carefully incorporated the stained-glass window and its lighting into a cohesive program about the mystery of divine revelation and theophanies.[63] They note how the artist incorporated the light from the window into the frescoes directly adjacent to the windows by creating dramatic scenes of illuminated divine messengers shining their heavenly light onto their recipients in a way that imitates the actual colored light coming from the window. Taddeo was not the first to

[63] Hills, *The Light of Early Italian Painting*, 75-86; Norman, "Two Funerary Chapels," 169-179.

do this. As mentioned, Simone did so in the chapel of St. Martin and, even closer in time and space, Taddeo's master, Giotto, had used the ambient light as inspiration for his frescoes in the Bardi and Peruzzi chapels, which were located just across the transept from Taddeo's own chapel.[64] However, unlike in Giotto's chapel, Taddeo used the windows' light to illuminate and describe the illusionistic scene and he also used the same light as a symbolic metaphor for the presence of the divine.

Attesting to Taddeo's interest in unusual lighting effects, his frescoes—particularly his *Annunciation to the Shepherds* (fig. 2.22)—depict dramatic night scenes and sensitivity to the shadows produced by bright light falling on the canteen's strap. Another aspect of Taddeo's chapel that attests to this artist's more in-depth interest in optics and light is the depictions of mirrors in the chapel's altarpiece (fig. 2.23). In the now-detached pinnacle, God is depicted as an older, bearded male figure surrounded by six angels. Four of the angelic beings shield their eyes from the divine glory of God while two hold mirrors as if to reflect God's likeness or rather, in the words of St. Paul, they view God "through a glass, darkly."[65] In any case, the angels experience the difficulty of viewing God's powerful illumination just as an artist would have experienced pain while trying to study the lighting of the sun.[66]

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[64] Hills, *The Light of Early Italian Painting*, 75.

[65] I Corinthians 12:13. For more on the panel see Norman, "Two Funerary Chapels," 172.

[66] That Taddeo was interested in dramatic instances of lighting and may have even injured his own eyes while trying to observe the sun may be supported by a letter to a preacher in which he records hurting his eyes while looking a solar eclipse. However, there is a debate whether he wrote the letter or not; Paul Hills noted that Taddeo's inspiration could have come from observing night scenes and their corresponding lighting effects in his daily life; Hills, *The Light of Early Italian Painting*, 81. For an overall summary of the debate see Norman, "Two Funerary Chapels," 179.

Although the Baroncelli altarpiece has traditionally been assigned to Giotto, many scholars have noted the master was in high demand at this time and the execution would have largely been carried out by his workshop. Taddeo Gaddi was taking his own commissions but he was still very involved with Giotto's shop and therefore it is not hard to imagine that Taddeo played a large role in the altarpiece as well.[67] When this possibility is taken into consideration, the depictions of mirrors in the original pinnacle take on greater import and evidence a larger network of glass. Thus, Taddeo's chapel illustrates another instance in which a painter engaged with various types of glass while he simultaneously painted vernacular scenes and details in an illusionistic manner.

Another way in which Taddeo's chapel engaged with a larger network of glass was through the depiction of transparent glass in the illusionistic niches at the base of the wall. One of these painted cupboards contains liturgical objects, among which is a vessel for wine made of transparent glass (fig. 2.24). By making the wine, or the blood of Christ, directly visible through the clear glass, the artist allowed the viewer an opportunity to see the liturgical blood of Christ and thus reflect on the transubstantiation and perhaps their own or loved ones' more earthly passing. Like the divine revelations occurring in the paintings above, the clear glass carafe offered the viewer a chance to come close to experiencing the physical presence of the divine. More will be said about how transparent glass facilitated relic worship in chapters 4, 5, and 6.

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[67] White, *Art and Architecture,* 413.

Conclusion

To understand fourteenth-century Italian stained-glass windows in their full cultural context, it is necessary to consider the history of glass as well as the windows' aesthetic and symbolic potential alongside the various other uses of Trecento glass. The Italian Trecento painters who were working with stained glass were also interested in other types of glass, either actual or illusionistic. Artists like Duccio, Simone Martini, and Taddeo Gaddi were all continuing in the long tradition of glass arts as well as adapting the medium to their unique situations.

In most Gothic stained-glass windows, the imagery functioned as a sort of "illuminated painting," to use the words of Anne Friedberg.[68] However, as Friedberg points out, the stained-glass window was a non-perspectival picture plane.[69] Friedberg does not speak specifically about Italian Trecento windows. Had she done so, she might have noted how, in the hands of Duccio, this illuminated painting began to take on a greater sense of perspective, particularly in his renderings of the evangelists at their desks in the corners of the window for Siena's cathedral. When employed by Simone and Taddeo, the window also showed signs of perspective—for instance in the pedestals on which the saints stand. The windows in Assisi and Florence also became more three-dimensional in the sense that they interacted with their surrounding decorative complex. The windows' effects were not confined to the single plane of their glass panels; rather, they projected their colorful light, and thus their agency, into the pictorial reality around them and thus, into the viewer's space.

This chapter has demonstrated that Italian artists well known for their illusionistic space, naturalistic modeling, and narrative skills applied these same objectives when working with

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[68] Friedberg, *The Virtual Window*, 107.

[69] Ibid., 107-108.

glass. Stained-glass windows provided them new opportunities to advance these interests by harnessing the powerful and beautiful symbol of colored light to their artistic goals. As has been alluded to throughout this chapter, many of the ideas presented in the following chapters have their roots in the artworks, artists, and ideas presented here. This study argues that when working with gilded glass and transparent glass, some of these same Trecento artists assimilated these media to their already-existing objectives and sensibilities rather than simply adopting the traditional methods of working with glass. In these ways, it is possible to see that glass was both a reflection of and inspiration for Trecento artistic production and, in turn, visuality.

CHAPTER THREE

GILDED GLASS

The last chapter explored how light filtering through the stained glass or captured by the colored glass of enamel held rich symbolic potential for both the Gothic and Early Renaissance viewers. This chapter examines a different, but equally powerful, type of lighting effect: the sparkling reflections produced by gilded glass. Such a study is necessary because, though not often discussed, reflective glass panels are found throughout fourteenth-century art, in media ranging from sculpture to fresco. For example, Giotto's Crucifix for Santa Maria Novella features glass inlays in the halo of Christ (fig. 3.1). In Orcagna's *Tabernacle* for Orsanmichele (fig. 3.2), gilded glass added a glittering effect evocative of a heavenly edifice (fig. 3.3). In Simone Martini's *Maestà* for Siena's Palazzo Pubblico (fig. 3.4), verre églomisé panels, or panels of

reverse-painted glass, were set into the fresco and illuminated the mystical nature of Christ's halo and the Virgin's throne (fig. 3.5). In Paolo di Giovanni Fei's *Madonna and Child* in New York's Metropolitan Museum (fig. 3.6), verre églomisé roundels featuring depictions of holy figures punctuate the border and serve as the Virgin's brooch. Through such case studies, this chapter re-examines Trecento art with greater sensitivity to the conscious creation of these dramatic reflections of light. In so doing, it demonstrates the ways that Trecento art responded to fourteenth-century visuality, which was both an extension of medieval traditions and an anticipation of Renaissance ones.

In most earlier art-historical scholarship such as the canonical work by John White, which primarily focused on stylistic concerns, the sparkling highlights created by gilded glass panels were avoided in professional reproductions of artworks because they obscured a complete view of the work. In many cases, their omission from photographic documentation led to their exclusion from analysis of Trecento art. This study argues that such dramatic lighting effects are crucial to an understanding of how a fourteenth-century viewer would have perceived and interpreted the artworks. To that end, this chapter investigates the creation and reception of Trecento artworks with gold-backed panels of glass within the context of potential symbolic associations with gold and contemporary optical theory. It does so with an investigation of verre églomisé in early sculptural monuments by Nicola Pisano, paintings by Simone Martini, and later works by Paolo di Giovanni Fei and Lorenzo Monaco (fig. 3.7). The best-known examples of late medieval and early Renaissance verre églomisé were the many Trecento reliquaries to be discussed in chapter 5. Because they also used transparent glass, a more detailed analysis of these objects and how they functioned as reliquaries will take place after a discussion of clear

glass. The present chapter anticipates their analysis by focusing on the historical development and general reception of verre églomisé.

This examination suggests that appreciation of gilded glass was in part a continuation of the medieval penchant for sparkling surface reflections and in part a product of a uniquely Trecento outlook. The particularly Trecento adaptation of gilded glass, namely verre églomisé, serves as an informative example because its production coincided roughly with the fourteenth century and it combined sparkling gold glass with naturalistically modeled imagery and thereby fused current trends in painting with traditional medieval materials and visual effects. When taking all these aspects into consideration, it is possible to position verre églomisé within a moment of cultural transition from the late medieval tradition to an early Renaissance one indicative of the fourteenth century.

The shining, glittering quality of many so-called "minor arts" or "luxury arts" from the eleventh and twelfth centuries such as the *Stavelot Triptych* (fig. 2.7) has long been associated with the medieval aesthetic. Such formal qualities, emphasizing color and light, have been linked to a medieval theory of beauty, most famously by Umberto Eco in his book, *Art and Beauty in the Middle Ages.* Eco's effort to "establish how the theories current at the time were related to [the medieval Latin] sensibility and its actual artistic products" is not only helpful for this study's assessment of late medieval art, but can also serve as a model for the overall project.[70] Following Eco's methodology, which blends artistic practice and aesthetics, the present chapter builds from current scholarship on medieval art, aesthetics, as well as optical

[70] Umberto Eco, *Art and Beauty in the Middle Ages,* trans. Hugh Bredin (New Haven: Yale University Press, 2002), 1. This text was originally published as Umberto Eco, "Sviluppo dell'estetica medievale," in *Momenti e problemi di storia dell'estetica,* vol. 1 (Milano: Marzorati, 1959).

theory in order to analyze a specific group of Trecento Italian works featuring gilded glass panels, in particular the technique of verre églomisé.

To understand the reception of verre églomisé and artworks incorporating it, it is important to consider fourteenth-century conceptions of light, as these were very different from modern ones. Crucial to such a study are the primary sources such as the writing of St. Bonaventure, who wrote extensively about light. A particularly informed secondary reading of these sources is found in Paul Hills's *The Light of Early Italian Painting.* Although Hills focuses primarily on the monumental frescoes of the Trecento and does not discuss the medium of verre églomisé specifically, his methodology is still useful here as he treats similar optical phenomena.

Because of this study's interdisciplinary nature, it was necessary to consult scholars from a wide range of fields. Monographs on artists such as Simone Martini and Nicola Pisano by Andrew Martindale and Anita Fiderer Moskowitz, respectively, provided background on the commissions and documentation of the artworks while models for analysis of light theology, color perception, and visual theory were provided by the work of Eve Borsook, Hayden Maginnis, and Paul Hills.[71] Additional background on the more scientific aspects of light and sight is found in the work of a historian of science, David C. Lindberg, and Arthur Zajonc, a professor of physics.[72] The writings of St. Bonaventure and Abbot Suger, as well as Biblical

[71] Andrew Martindale, *Simone Martini: Complete Edition* (New York: New York University Press, 1988); Anita Fiderer Moskowitz, *Nicola and Giovanni Pisano: The Pulpits: Pious Devotion - Pious Diversion* (London: Harvey Miller Publishers, 2005); idem, *Nicola Pisano's Arca di San Domenico and its Legacy* (University Park, PA: Pennsylvania State University Press, 1994); Eve Borsook, "Rhetoric or Reality: Mosaics as Expressions of a Metaphysical Idea," *Mitteilungen des Kunsthistorischen Institutes in Florenz* 44 (2000): 2-18; Hayden Maginnis, *The World of the Early Sienese Painter* (University Park, PA: Pennsylvania State University Press, 2001); Paul Hills, *The Light of Early Italian Painting* (New Haven, CT: Yale University Press, 1987).

scripture, help to provide insights into the contemporary reception of light and gold.[73] Finally, the history of the technique of verre églomisé is thoroughly discussed by scholars such as Silvana Pettenati and Carlo Bertelli.[74]

Though drawing extensively from these and other works, this study is unique for its interrelated approach to glass arts and its analysis of verre églomisé as a single phenomenon within part of a larger cultural trend of using gilded glass. It contributes to the ongoing debate concerning early modern visuality with its assertion that the growing prominence of glass in Trecento art and culture is indicative of characteristic features of that period's visuality. With that in mind, it is helpful to first establish the artistic context of the late Duecento before taking a more in-depth look at the revival and reception of verre églomisé.

The Golden Glitter of Mosaics and Cosmati

Some of the most popular types of gilded glass predating the verre églomisé panels were those used to make mosaics and cosmati work.[75] Medieval mosaics, such as those at the mausoleum of

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[72] David Lindberg, *Theories of Vision From Al-Kindi to Kepler* (Chicago: University of Chicago Press, 1976); Arthur Zajonc, *Catching the Light: The Entwined History of Light and Mind* (Oxford: Oxford University Press, 1993).

[73] Ewert Cousins, *Bonaventure,* Classics of Western Spirituality (New York: Paulist Press, 1978); Erwin Panofsky, *Abbot Suger on the Abbey Church of St.-Denis and its Art Treasures* (Princeton, NJ: Princeton University Press, 1979).

[74] Silvana Pettenati, *I vetri dorati graffiti e i vetri dipinti* (Turin: Museo Civico di Torino, 1978); Carlo Bertelli, "Vetri italiani a fondo d'oro del secolo XIII," *Journal of Glass Studies* 12 (1970): 70-78.

[75] For general texts on these techniques, see Ferdinando Rossi, *Mosaics: A Survey of Their History and Techniques* (New York: Praeger, 1970); Janetta Rebold Benton, "Mosaic: Sparkling Surfaces," in *Materials, Methods, and Masterpieces* (Santa Barbara: Praeger, 2009); Edward

Galla Placidia in Ravenna depicting *Christ as the Good Shepherd* (fig. 3.8) or the *Last Judgment* by Coppo di Marcovaldo in the Baptistery of Florence (fig. 3.9) were made up of small glass or stone *tesserae* set into the plaster.[76] Though mosaics date back to ancient times, many art historians trace the most profound influence on late medieval and early Renaissance mosaics to Byzantine artists, some of whom even traveled to Italy and worked on commissions such as that at the Florentine baptistery.

The process for creating, shaping, and setting the pieces of glass required a great level of skill, attention to detail, and time; thus art historians long assumed that mosaicists consciously created the dramatic lighting effects associated with the medium in order to evoke divine symbolism. In "Rhetoric or Reality: Mosaics as Expressions of a Metaphysical Idea," Eve Borsook supported this theory by demonstrating that many *tituli* proclaimed both the spiritual and formal qualities of the mosaics they adorned.[77] She further argued that the ways in which artists manipulated the *tesserae*, that is, by tilting them, applying them with their reverse side showing, and using silver in combination with gold, were specifically designed to "enhance the glitter."[78]

Hutton, *The Cosmati: The Roman Marble Workers of the Twelfth and Thirteenth Centuries* (London: Routledge and Paul, 1950); Paloma Pajares-Ayuela, *Cosmatesque Ornament: Flat Polychrome Geometric Patterns in Architecture* (New York: Norton, 2001).

[76] The medium was used as early as ancient Roman times but many of these works featured more subdued, natural colors and used stone or marble. It was not until the fourth century that colored glass was introduced and the palette increased to include bolder, brighter colors. Benton, "Mosaic: Sparkling Surfaces," 69.

[77] Eve Borsook, "Rhetoric or Reality," 3. For more on mosaic inscriptions, see Erik Thunø, "Inscription and Divine Presence: Golden Letters in the Early Medieval Apse Mosaic," *Word and Image* 27 no. 3 (2011): 279-291.

[78] Borsook, "Rhetoric or Reality," 9. While she found that the tendency for mosaics to "perform in a liturgical way" by coming to "embody divine illumination" decreased after the twelfth

Interestingly for the purpose of this study, Borsook noted that while the inscriptions she cited referred to all different types of *tesserae*, "marble tesserae are dead to the action of light while glass can reflect and radiate it."[79] Thus, gold glass *tesserae* could have created a more pronounced visual effect and with it more profound symbolism than other media. The ability of gold glass to reflect light would have also served a more practical end. Many of the interiors adorned with mosaics were dark. The amplifying effects of the reflecting gold *tesserae* would have helped illuminate the interior, particularly at sites like the mausoleum of Galla Placidia, which had limited space for windows and the windows it did have were covered with sheets of translucent—but not transparent—alabaster.[80]

A later Trecento adaptation of this practice is found in the lower church of San Francesco in Assisi. Though almost all the walls of the Franciscan mother church are covered with naturalistic fresco paintings, silver-backed glass is used in the ceiling of the lower church. The ceiling was painted dark blue with gold stars to resemble the sky. Artists set round, convex pieces of glass backed with silver into the contour of the stars (fig. 3.10).[81] Thus, as viewers entered the crypt-like lower church and solemnly made their way through the space towards the high altar, the silver-backed glass panels would have sporadically caught the light and appeared similar to twinkling stars in the heavenly sky. Under the frescoes and glass panels, viewers likely felt a powerful connection to the celestial sphere above.

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century, the medieval viewer still had access to earlier works that demonstrated these qualities. Ibid., 11-12.

[79] Ibid., 5.

[80] Benton, "Mosaic: Sparkling Surfaces," 75.

[81] Hayden Maginnis, "Assisi Revisited: Notes on Recent Observations," *The Burlington Magazine* 117 no. 869 (August 1975): 512.

As was the case with the wall and ceiling mosaics, another style of mosaic that made its way from Byzantium to Italy was the miniature mosaic, or micromosaic. This technique called for the same basic procedure used in wall and ceiling mosaics except that here the scale was much smaller, usually applied to personal devotional panels. Because these mosaics were applied to small panels of wood, the *tesserae* were set into wax rather than plaster. The transmission of this technique from the Byzantines to the Italians and its revered nature are demonstrated by the case of the miniature mosaic of the *Man of Sorrows* (fig. 3.11), which is currently displayed within a later Italian triptych. This micromosaic panel was made by a Byzantine artist around 1300 and imported to Italy where it was incorporated into its present reliquary triptych by Italian artists around 1380.[82] Set amongst many relics in the center of the triptych, the micromosaic takes on the aura of a relic itself.[83]

Although popular in Rome and commonly associated with Roman origins, another form of mosaic, cosmatesque work, was also greatly influenced by Byzantium, as well as by Islamic and Carolingian artworks.[84] Cosmatesque works can be likened to mosaics in that they are composed of small pieces of stone, glass, or other materials, but they are dissimilar in that they frequently depict geometric patterns rather than figurative ones. The primary reason they are included in this chapter stems from the fact that, as discussed below, some of the more sumptuous cases of cosmati work included extensive use of gilded glass which, when hit by light, would shine as brightly as ceiling mosaics.

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[82] Martina Bagnoli et al., eds., *Treasures of Heaven: Saints, Relics, and Devotion in Medieval Europe* (New Haven, CT: Yale University Press, 2010), 201-202.

[83] This icon was associated with the story of St. Gregory's vision. Though originally the woman who doubted the Eucharist saw a vision of a finger in its place, eventually this icon became associated with the vision. For more on this, see Bagnoli et al., *Treasures of Heaven*, 202.

[84] Pajares-Ayuela, *Cosmatesque Ornament*, 22-28.

The cosmatesque technique took its name from a family of artists from Rome, the Cosmati, and was most often used to decorate floors, tabernacles, altars, and tombs from the eleventh through the early thirteenth century.[85] When decorating the floor, the artist frequently used durable stone or marble rather than more delicate materials. Though many examples can be found in Rome, cosmati works were also made in the surrounding area and England; masterpieces of cosmati are located in Viterbo, Anagni, Ferentino, Civita Castellana, and Westminster Abbey.[86] Some of the more famous examples include the tomb of Hadrian V from ca. 1276 by Arnolfo di Cambio in S. Francesco Viterbo, the same artist's ciborium at San Paolo fuori le Mura from ca. 1285, the tomb of Honorius IV from the 1280s in S. Maria in Aracoeli, and the tomb of Clement IV from 1271-74 in S. Francesco in Viterbo.

A much later work that utilized cosmati was Orcagna's tabernacle at Orsanmichele, which was originally built to house the image of the Virgin by Bernardo Daddi (fig. 3.2). The great expense of Orcagna's tabernacle was largely funded by donations and bequests made in response to the Black Death of 1348. The work's importance did not just come from its monetary cost. Its location was associated with a previous image of the Madonna that had miraculous healing powers. To imbue the marble structure with a sense of sacred value, Orcagna's cosmati included extensive use of gilded panels throughout the railings, in the reliefs, and especially in the depiction of the *Assumption of the Virgin* on the back of the tabernacle where reflective panels fill the sky and frame the scene as demonstrated in figures 3.12 and 3.3.

[85] Ibid., 11, 18.

[86] Other notable sites in Rome featuring the medium: San Lorenzo fuori le Mura, San Paolo fuori le Mura, Santa Maria in Aracoeli, Santa Maria in Cosmedin, Santa Maria Maggiore, and the Stanza della Segnatura.

Having established that mosaic, cosmati and verre églomisé were similar in that they each produced glittering gold highlights, one should ask, Why would artists have taken the extra step of inscribing imagery into the gold? In other words, what unique characteristics could this medium offer? To explore such questions, this chapter outlines the history of the medium and discusses some particularly important examples from the late Duecento and Trecento, namely, Nicola Pisano's Siena Cathedral Pulpit (fig. 3.13) and Arca di S. Domenico (fig. 3.14), Simone Martini's *Maestà* (fig. 3.4) and *St. Louis of Toulouse* (3.15), and later works by artists such as Paolo di Giovanni Fei (fig. 3.6) and Lorenzo Monaco (fig. 3.7).

A History of Verre Églomisé

As Cennino Cennini described, verre églomisé was the process in which an artist applied gold leaf to portions of a glass panel, inscribed imagery into the gold leaf in reverse, and then protected the work with a black or colored backing.[87] The earliest version of verre églomisé was the Hellenistic Greek technique known as sandwich gold glass, the process in which two sheets of glass protect, or sandwich, the delicate gold-leaf decorations, as opposed to backing the gold with pigment as was done in the Trecento.[88] In ancient Greek works such as the *Sandwich Gold-*

[87] Cennino Cennini, *Il libro dell'arte*, trans. Daniel V. Thompson, Jr. (New Haven: Yale University Press, 1933), text on pp. 107-108, translation on pp. 112-114. For Italian text, see also Carlo and Gaetano Milanesi, eds., *Il libro dell'arte o trattato della pittura, di Cennino Cennini da Colle Valdelsa; di nuovo pubblicato con molte correzioni e coll'aggiunta di più capitoli tratti dai codici fiorentini* (Florence: Felice Le Monnier, 1859).

[88] For more on Hellenistic sandwich glass, see Jennifer Price, "Glass," in *A Handbook of Roman Art,* ed. Martin Henig (London and New York: Phaidon Press, 2006), 206. Though it doesn't use transparent glass, an Etruscan earring from the sixth century BCE displays a similar technique: gold filigree is covered by a piece of rock crystal. "Origin and Influence Cultural Contacts:

Glass Bowl from the third century BCE in the British Museum (fig. 3.16), elaborate foliage patterns of gold are sandwiched between two pieces of mostly transparent glass.[89] Because the Greek glassmakers used the laborious techniques of core-made and cast glass their glass products were relatively expensive luxury items.[90]

Roman glassmakers developed the technique of glass-blowing by the first century BCE. This technique made all types of glass—including verre églomisé—more affordable, economical, and experimental.[91] Roman gold glass, which also typically backed the gold leaf with a second layer of glass, was commonly used to decorate the base of a drinking vessel or bowl and featured pagan, Jewish, and Christian motifs in a circular composition. Many ancient Roman verre églomisé roundels with Christian imagery (fig. 3.17) survive to the present day because, for reasons that are not fully understood, these medallions were detached from their functional objects and pressed into the walls of the catacombs.[92]

Production of Roman verre églomisé peaked during the third and fourth centuries but sharply declined after the fifth.[93] In general, glass production in the Latin West experienced a

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Egypt, the Ancient Near East, and the Classical World," *The Metropolitan Museum of Art Bulletin* 29 no. 7 (March 1971): 326.

[89] Hugh Tait, *Five Thousand Years of Glass* (London: British Museum Press, 1991), 49.

[90] Price, "Glass," 206.

[91] Ibid., 207.

[92] C. Louis Avery discussed the traditional theory that they were used for identification purposes as well as Eisen's theory that they served a protective capacity, warning evil spirits to stay away from the Christians. For more on this debate and for further bibliography, see C. Louis Avery, "Early Christian Gold Glass," *The Metropolitan Museum of Art Bulletin* 16 no. 8 (August 1921): 170.

[93] Ibid., 171; Pettenati, *I vetri dorati*, 17.

severe decline and limited production from the fifth century through the late thirteenth.[94] However, artists in Islamic territories, especially near Syria and around Egypt, continued to produce sandwich gold glass. Three primary examples of Syrian sandwich gold glass include the fragmentary cup in The David Collection of Copenhagen (fig. 3.18), an intact bottle in the British Museum (fig. 3.19), and a cup in The Corning Museum of Glass (fig. 3.20). The production of such gold-glass objects in Islamic territories was brief and limited compared with Roman output, confined to the ninth and tenth centuries.[95] Based on the relatively few extant examples and the short-lived nature of its production, Stefano Carboni, a specialist in Islamic glass, suggests that Islamic gold glass was not commissioned by royal circles in a programmatic way but rather was an experimental response to the challenge of earlier Roman models.[96]

The Latin West's revival of verre églomisé, a modified version of sandwich glass where the gold is backed with pigment rather than another sheet of glass, occurred in the later thirteenth century and was likely influenced by Roman examples. Though Greeks and Muslims both made significant contributions to the history of verre églomisé, the Duecento and Trecento artists, patrons, and viewers would have had limited access to examples of Greek and Islamic sandwich gold glass. In contrast, Roman verre églomisé would have been easily accessible in terms of numbers and location. Furthermore, the Roman examples of verre églomisé that later medieval people encountered could have held profound religious associations, as will be described below.

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[94] Alan Macfarlane and Gerry Martin, *Glass: A World History* (Chicago: Chicago University Press, 2002), 16-18.

[95] Stefano Carboni and David Whitehouse, *Glass of the Sultans* (New York: Metropolitan Museum of Art, 2001), 222.

[96] Ibid., 222. This seems plausible but it should also be noted that the Islamic artists were not depicting figurative imagery but rather featured vegetal motifs and pseudokufic script.

Nicola Pisano's Siena Pulpit and the Arca di San Domenico

The earliest use of verre églomisé in the medieval West occurred during the seventh decade of the thirteenth century in two of Nicola Pisano's concurrent commissions: the pulpit for the Cathedral of Siena (1265-1268) (fig. 3.13) and the Arca di San Domenico in Bologna (1264-1267) (fig. 3.14).[97] In addition to these large, public works, smaller examples of this medium by other artists are also documented, but these would have not been accessible to a large audience and this section thus focuses on Nicola's works.[98]

In 1264, Nicola and his workshop were commissioned to commemorate the revered founder of the Dominican order with a monumental marble tomb, now called the Arca of San Domenico, for the church dedicated to the saint in Bologna.[99] Though Nicola's original design was modified significantly through the sixteenth century, a portion of the tomb by Nicola is still visible. Modeled on ancient Roman works, the sarcophagus features figurative relief sculptures on all four sides showing episodes from the life of St. Dominic.[100] Its art-historical significance

[97] The first scholars to notice the use of verre églomisé in the work of Nicola Pisano were Georg Swarzenski, "Das Auftreten des Eglomisé bei Nicola Pisano," in *Festschrift Paul Clemen* (Düsseldorf: Schwann, 1926), 32 and Pietro Toesca, "Vetri italiani a oro con graffiti," *L'Arte* 11 (1908): 247-261.

[98] Pettenati, *I vetri dorati,* 18 describes these works as an icon mentioned in the 1295 inventory of Pope Boniface VIII (originally discovered by Émile Molinier in 1884) and two medallions with imagery of St. Mark and St. John found in the tomb of Pope Clement IV, who died in 1268 (published by Pietro Toesca in 1908). The inventory text is given and translated in Stefano Carboni, *Venice and the Islamic World: 828-1797* (New York: Metropolitan Museum of Art, 2007), 341 as "unam iconam de opera veneticorcum de una tabula in qua est figyura maiestatis in medio et plures perle, alie in vitro ad aurum" and translated as an "icon made in Venice with a central figure *in majestatis* surrounded by pearls and other [figures] in verre églomisé."

[99] According to Moskowitz, *Arca di San Domenico,* 8 the earliest sources on the Arca do not name the sculptor, but it has long been associated with Nicola Pisano because of Vasari's attribution and based on stylistic reasons. For more on the dating and documentation see ibid. For a more detailed description of Nicola's work see ibid., 9.

stems largely from its innovative forms and its far-reaching influence on later tomb projects.[101] Of greatest interest to this study is the fact that the backgrounds of these reliefs are filled with verre églomisé panels featuring small, golden rosettes and geometric shapes backed with red pigment (fig. 3.21). Though Anita Fiderer Moskowitz does not analyze them in any detail, these gilded glass panels contributed greatly to the viewers' experiences of the work.[102] When the lighting conditions were right, these glass panels would have produced bright, sparkling highlights that could have conveyed the sacred nature of St. Dominic's life as well as his relics in visually powerful ways.

Though there is no documentation describing why Nicola might have embraced the new medium of verre églomisé, some suggestions can be made based on his particular interests in combination with larger artistic trends. Certainly, the prominence of gold in the Arca should be situated within the increasing use of gold in mosaics and cosmati. Originally inspired by Byzantine examples, these and other imports such as the gilded icon panel and the use of chrysography had significant impact on the growing use of gold in Italian works of the thirteenth and fourteenth centuries.[103]

Because much of the inspiration for the use of gold came from Byzantium, one should ask whether the Italians also adopted the Byzantine significance of gold. Lois Heidmann Shelton suggests that, for Byzantines, gold held special meaning because "within the hierarchy of the material and spiritual worlds, gold was the material closest to the immaterial and was connected

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[100] Ibid., 2.

[101] Ibid., 2-4.

[102] Of the verre églomisé, ibid., 9 states, "The background of the reliefs is composed of a variety of patterns in red and gold verre églomisé, much of it restored."

[103] Hills, *The Light of Early Italian Painting,* 25.

by its luminosity, the source of its immaterial appearance, with the beauty and light of the Divine."[104] Thus, in Byzantine art, gilded backgrounds were crucial to the effectiveness of icons because of their ability to connect the spiritual and material worlds and give visible form to the invisible. Because the Latin West did not adopt the function and significance of the Byzantine icon, however, Shelton argues that their use of gold would have had different symbolism.[105]

While it is true that the West did not embrace icons in the same way as the Byzantines and Shelton's argument may thus hold true for Italian panel paintings, it does not necessarily apply when one considers the gold decoration on reliquaries or tomb monuments, such as the Arca. Western veneration of relics and the Eucharist was similar in nature to the Byzantine veneration of icons because these sacred treasures represented a tangible point of contact between heaven and earth. As the gold did for the icons, the gilded glass panels in the Arca brought visual form to the dichotomy between the heavenly and earthly with their sharp, glowing highlights.

The practice of using gold to designate a special point of intersection between the spiritual and natural worlds can be traced back to the Bible. When God gave Moses instructions to build a sanctuary to mark his earthly presence, he directed that gold be used extensively in the table, lamp stand, and Ark of the Covenant, the latter of which is described in Exodus 25 as follows:

> They shall construct an ark of acacia wood two and a half cubits long, and one and a half cubits wide, and one and a half cubits high. You shall overlay it with pure gold, inside and out you shall overlay it, and you shall make a gold molding around it. You shall

[104] Lois Hiedmann Shelton, "Gold in Altarpieces of the Early Italian Renaissance: A Theological and Art Historical Analysis of its Meaning and of the Reasons for its Disappearance" (Ph.D. diss., Yale University, 1987), 25.

[105] Ibid.

> cast four gold rings for it and fasten them on its four feet, and two rings shall be on one side of it and two rings on the other side of it. You shall make poles of acacia wood and overlay them with gold. You shall put the poles into the rings on the sides of the ark, to carry the ark with them. The poles shall remain in the rings of the ark; they shall not be removed from it. You shall put into the ark the testimony which I shall give you. You shall make a mercy seat of pure gold, two and a half cubits long and one and a half cubits wide. You shall make two cherubim of gold, make them of hammered work at the two ends of the mercy seat.

The instructions for the ark do not contain any gemstones or paint colors; the only specifications made pertain to the use of gold. Gold was ideally suited to decorate a symbol of the intersection between the divine and human worlds because of its transformative ability. The same piece of gold could look very different depending on the environment. When it was lit by a strong light, gold could shine with a bright yellow color. However, when no light was shining on it, it appeared to have a darker and more matte hue. Contained within one material, there were two very different visual possibilities.

Thus, the use of verre églomisé for the saint's tomb could have embodied the dual nature of the divine, representing both its material and immaterial manifestations. When at their brightest, these reflections produced intense beams of light that sparkled and moved in a lively way, that could have dematerialized the surface texture of the glass (fig. 3.22). These abstract, almost supernatural effects could have represented the presence of the divine in contrast with the naturalistic narratives serving as reminders of the earthly existence.

This interpretation is made more compelling when one observes the fact that, unlike other early uses of verre églomisé, which will be discussed shortly, the gold glass in the Arca is backed with red pigment, helping it make a strong visual connection to the blood of the deceased saint

within the tomb.[106] Juxtaposing the glimmering gilded designs and bright red pigment could have therefore conveyed both the human life of St. Dominic and his heavenly afterlife. The plausibility of this hypothesis is supported by the widespread use of verre églomisé to decorate reliquaries in the Trecento (discussed in chapter 6) and by a key concept of the late-medieval understanding of light: it was believed to have a corporeal form but, in its purest state, this form was invisible to one's physical sense of sight, only revealing itself through divine intervention.[107]

Nicola Pisano's work is an important case study because it is the first early modern work to link verre églomisé and relics. Though art-historical scholarship has not yet addressed the important questions regarding Pisano's inspiration or motivation, given his strong interest in classical art and the many ancient Roman verre églomisé roundels found in the catacombs, it seems logical to posit that this could have been a contributing factor. Irina Taïssa Oryshkevich effectively dispelled the previously held assumption that the catacombs went out of use during the later medieval and early Renaissance periods.[108] She supported her claim with literary evidence such as the *Mirabilia urbis Romae* and hagiographic texts in addition to archeological evidence such as the construction of aboveground cemeteries and churches that were physically linked to the catacombs by tunnel.[109] She found that, despite the fact that many of the relics were

[106] The use of red pigment for the Arca is conspicuous because, while other works of verre églomisé feature red, no other work of which I am aware uses it so extensively and at the exclusion of other colors. When other verre églomisé works do use red, it is often used to denote blood, as seen in fig. 6.1 where the red pigment is used for the blood gushing from Christ's side wound. For another rationale see also chapter 4, p. 95.

[107] Hills, *The Light of Early Italian Painting,* 11. For more discussion on theories of the nature of light at this time, see chapter 6.

[108] Irina Taïssa Oryshkevich, "The History of the Roman Catacombs from the Age of Constantine to the Renaissance" (Ph.D. diss., Columbia University, 2003).

removed to churches inside the city walls in the eighth century, the catacombs continued to be a source of spiritual and artistic inspiration for people of the later Middle Ages.

Although Early Christians stopped using the catacombs as burial grounds after the fifth century, many Christians continued to visit the dead throughout the Middle Ages.[110] Because the catacombs had contained the resting place of the revered Early Christian martyrs, often they were turned into a shrine or commemorated with an aboveground cemetery or church.[111] Later Duecento and Trecento artists and spiritual pilgrims had access to the catacombs and examples of ancient gold glass, making it plausible that if Nicola stopped in Rome during his travels, he might have followed the many guidebooks to the ancient catacombs and seen examples of Roman verre églomisé.[112]

While this connection is admittedly tenuous, it is not tenuous to argue that Nicola's strong interest in ancient Roman art made it likely that he would naturally have been interested in other examples of it, whether in a catacomb or removed from one. A very likely source of inspiration was the Camposanto located in Pisa; however, it is also possible that there were other examples of Roman art in Pisa that do not survive. The issue of the survival rate is always an important factor to consider when studying early modern artworks and it is of particular

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[109] Ibid., 17 for more on tunnels from churches to catacombs. See also Laurie Brink and Deborah Green, *Commemorating the Dead: Texts and Artifacts in Context: Studies of Roman, Jewish, and Christian Burials* (New York: Walter de Gruyter, 2008), 14.

[110] Ibid., 13-14.

[111] Debra Julie Birch, *Pilgrimage to Rome in the Middle Ages: Continuity and Change* (Woodbridge, UK: The Boydell Press, 1998), 13.

[112] In his Life of Nicola Pisano, Vasari wrote that Nicola went to Viterbo and Naples. Though Vasari doesn't mention Rome, the Eternal City is located between the two and would have therefore been a likely stop. Giorgio Vasari, *Lives of the Most Eminent Painters, Sculptors, and Architects,* vol. 1, trans. Gaston du C. De Vere (New York: AMS Press, 1976), 35.

relevance for this study because of the fragile nature of glass art works. Whatever his initial reason for using verre églomisé, Nicola must have found the medium effective, because he also used it in his next important commission.

Only a year after receiving his commission for the Arca, Nicola and his workshop began work on the pulpit for the cathedral of Siena, where they also used verre églomisé. This project was commissioned by the Opera of the Sienese Duomo as part of a citywide improvement program and should be situated within Siena's cultural ascendancy and fervent dedication to the Virgin Mary. Within the decade preceding the pulpit, Siena had enlisted and received the protection of the Virgin Mary to defeat the Florentines at the Battle of Montaperti in 1260 and completed construction on their city's cathedral dedicated to the Madonna.

The pulpit should also be contextualized within Nicola's earlier commission for a similar pulpit in Pisa as well as his Arca. Only five years before he began the pulpit for Siena, Nicola completed a pulpit for the baptistery of Pisa that celebrated the life of Christ. Unlike the Pisan pulpit, the Sienese pulpit has eight sides, seven devoted to marble relief panels and one for the entrance. The sculptural narratives in Siena depict stories from the life of Christ in multi-figure scenes that demonstrate both an understanding of ancient Roman sculptural styles and awareness of the more emotional Gothic trends. Also unlike the baptistery's pulpit—but similar to the Arca—the pulpit for the Sienese Duomo included small panels of verre églomisé decorated with floral motifs set within the trilobed cusping and running along the base of the marble panels (fig. 3.23).

The verre églomisé embellishments certainly added an impressive lighting effect to Pisano's Sienese pulpit but, because it did not function as a tomb or reliquary, the symbolic interpretation assigned to gold in the discussion of his Arca does not readily apply. Furthermore,

the pulpit in Siena features much less verre églomisé and what gold glass is present, is relegated to the base of the pulpit; it does not fill the background of the narrative panels. Another prominent difference is that in the Arca, the verre églomisé is backed with red paint while in the Siena pulpit, the artist used black backing. Therefore, upon initial comparison, these two works appear to have little in common in terms of their function and the use of verre églomisé, a somewhat surprising conclusion considering that they were made by the same workshop at the same time.

However, upon closer consideration, plausible explanations for Nicola's treatment of the verre églomisé on his pulpit emerge. Throughout the thirteenth and fourteenth centuries the priest would ascend such a pulpit in order to better address the congregation as he read the Gospel or Epistles. The pulpit's height and visibility also made it the ideal place from which to display the church's prized relic collection.[113] Thus, like the tomb of St. Dominic, Nicola's pulpit could have been associated with relics and warranted a similar use of the verre églomisé. However, as the pulpit's primary function was for preaching and reading the gospel, the use of the medium is significantly smaller. The fact that one of Nicola's assistants used verre églomisé in a similar way on another pulpit only a few years later is further evidence that Nicola's work was not an anomaly. In approximately 1270, Guglielmo da Pisa—one of Nicola's assistants on the Arca—applied a similar treatment to that on the saint's tomb to his pulpit for S. Giovanni Fuorcivitas in Pistoia (fig. 3.24), a fragment of which is preserved in that city's Diocesan Museum (fig. 3.25).[114]

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[113] Moskowitz, *Arca di San Domenico*, 21. In her discussion of the pulpit's use for the display of relics, Moskowitz cites the example of the raising of the relics of Saint Ranierus in 1161 in the Pisa Cathedral. For more on the use of pulpits for the display of relics and the connections between Pisano's treatment of his pulpits and the Arca, see ibid.

Over the course of the Trecento, the use of verre églomisé grew in frequency and expanded to different genres. In some situations, such as the many reliquaries made using the medium discussed in chapter 6, the analysis given above could certainly apply. Because these reliquaries combine verre églomisé with portions of transparent glass, they will be treated separately. The remainder of this chapter focuses on later uses of verre églomisé in fourteenth-century paintings and offers a slightly varied interpretation of the medium from that applied to Nicola's works based on the very different contexts of the works.

Simone Martini's *Maestà* and *St. Louis of Toulouse*

Two of the earliest and most famous paintings to incorporate verre églomisé were made by the same artist, Simone Martini: his *Maestà* in Siena's Palazzo Pubblico from ca. 1315 (fig. 3.4) and the panel commemorating St. Louis of Toulouse from ca. 1317 (fig. 3.15). The *Maestà*, showing the enthroned Virgin Mary and Christ Child surrounded by a retinue of saints and angels, was painted on the wall of the *Sala del Consiglio*, a meeting chamber on the second floor of the town

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[114] Carboni, *Venice and the Islamic World*, 255-256. Carboni suggests that this pattern and perhaps even the use of verre églomisé was inspired by Islamic examples of sandwich glass from ninth- and tenth-century Syria. This issue will be taken up further in chapter 4. In the catalogue entry for this work (340-341) Carboni follows Bertelli's attribution to Venetian craftsmen working in Pistoia, citing the Venetians' close contact with Muslims. But Carboni's theory does not take into consideration that Nicola Pisano used it and Guglielmo could have seen it in his master's works.

The verre églomisé is found in the background of the reliefs and likely lined the bottom of the pulpit and the bookstand. It therefore would have covered a much larger area than that found in Nicola's pulpit. A possible explanation of Guglielmo's more extensive treatment may relate to a myth demonstrating his deep personal passion for relics, found in the Necrologio of the Convent of Santa Caterina, Pisa written by Fra Domenico da Peccioli (d. 1407). The story tells how, when Guglielmo attended the translation of St. Dominic's relics, he was so overcome with reverential passion that he stole a relic of the saint's rib for his convent of Santa Caterina; Moskowitz, *Arca di San Domenico*, 8.

hall. Though much has been written about this work, most scholarly assessments of the painting do not mention the approximately 25 panels of verre églomisé impressed into the wall's plaster along the furniture of the Madonna's throne and within Christ's halo (fig. 3.5).[115]

It is not hard to imagine that Simone's inspiration for including panels of gold glass came from his exposure to the nearby pulpit by Nicola in Siena's cathedral, exposure that Simone likely had due to his study of Duccio's *Maestà* panel for the high altar of the Siena Cathedral (fig. 2.11). That Simone was intimately aware of Duccio's altarpiece and valued it as an important religious symbol in Siena is evident because when he went to paint the same subject for the town hall, Simone closely mirrored Duccio's work. Both compositions featured rows of standing figures, each saint with individualized physiognomy and clothing, facing the Madonna and Child while the patron saints of Siena kneel at the bottom reverently gazing up at the Virgin and Christ. By visually linking his work in the town hall with Duccio's in the cathedral, Simone connected his depiction of the Virgin as Heavenly Queen to her role within the church as the mother of Christ. Simone's use of verre églomisé may have been another way to solidify this connection between Siena's religious center and political headquarters. His verre églomisé panels are very similar to those used by Nicola: the panels are small, feature gilded foliage motifs, and have black backing.

As Simone's *Maestà* was not used to store relics or display them, the previous analysis applied to the works of Nicola Pisano does not apply. It is therefore worthwhile to consider an alternative interpretation of the medium based on the most prominent themes in Simone's work and its civic setting. Unlike Duccio's painting, Simone's *Maestà* emphasizes the Virgin's secular power by surrounding her with earthly finery and depicting her as a queen. She wears a

[115] John White, *Art and Architecture in Italy: 1250-1400* (New Haven, CT: Yale University Press, 1993), 349-350.

richly decorated blue garment bound by a brooch of actual glass and sits in a sumptuous Gothic-style throne covered in gold with an elaborate cloth of honor hanging overhead.

Further support for the assertion that Simone's verre églomisé was meant to evoke courtly prestige can be offered by comparing other works by the artist. Two years after completing his *Maestà,* Simone used gilded glass in a similar fashion. His painting commemorating St. Louis of Toulouse for the saint's brother, King Robert the Wise of Sicily, featured a verre églomisé morse with the arms of Jerusalem and Sicily (fig. 3.26).[116] By using the verre églomisé for the morse of the saint, the artist drew attention to the royal heritage of Louis and his brother's divinely sanctioned authority. Thus, in both the *Maestà* and the panel of St. Louis, verre églomisé decorated and emphasized objects associated with secular power: the Madonna's throne and St. Louis's coat of arms. This is not to suggest that these works depict images of secular power; their subject matter is clearly concerned with the heavenly court, not an earthly one. However, to denote the power of the divine figures, the artist incorporated symbols of secular power. By using gilded glass to highlight these instruments of power, Simone simultaneously imbued them with a sense of power, material value, and heavenly mystery.

In contrast, when Simone's subject matter called for a more pious, spiritual emphasis, he did not employ the medium. Concurrent with his panel of St. Louis, Simone painted a chapel in the Lower Church of San Francesco in Assisi dedicated to St. Martin (fig. 2.14). This fresco cycle does not feature any use of verre églomisé. This lack of gilded glass in Simone's Assisi chapel becomes all the more conspicuous considering that on his way into the chapel, Simone passed under the aforementioned ceiling with stars of silver-backed panels of glass.

[116] Julian Gardner, "Saint Louis of Toulouse, Robert of Anjou and Simone Martini," *Zeitschrift für Kunstgeschichte* 39 (1976): 12.

Thus, it appears that Simone found verre églomisé particularly suited to subject matter with connotations of power and authority. However, it is important to note that in both the *Maestà* and *St. Louis*, secular concerns were subordinated to spiritual authority. For an understanding of how and why verre églomisé could have conveyed a combination of secular and sacred authority, it is helpful to consider a small sample of earlier uses of and references to gold.

As with gemstones, the medieval perception of gold as beautiful, symbolic, and valuable had a long tradition with roots as far back as biblical times. For example, when building his temple, King Solomon applied it extensively in his efforts to appropriately honor God. As it was described in I Kings 6: 21-22, "So Solomon overlaid the inside of the house with pure gold. And he drew chains of gold across the front of the inner sanctuary, and he overlaid it with gold. He overlaid the whole house with gold, until all the house was finished. Also the whole altar which was by the inner sanctuary he overlaid with gold."

There are many other references made to gold throughout the centuries but one of the most often cited is the opinion of Abbot Suger, who described his motivation for the renovation of St. Denis in writings and inscriptions. The example of Abbot Suger is useful here because, like Simone's *Maestà* and *St. Louis*—as well as Solomon's temple for that matter—St. Denis had royal ties. The royal courts and ecclesiastical institutions were the traditional repositories of wealth—and by extension, gold—during the medieval period. However, gold's expense was not its only attribute. Perhaps equally, if not more, appealing was the fact that gold could capture and reflect light in a uniquely powerful way. An inscription composed by Suger over the main doors of St. Denis revealed this feature of gold:

> All you who seek to honor these doors,
> Marvel not at the gold and expense but at the

craftsmanship of the work.
The noble work is bright, but, being nobly bright, the work
Should brighten the minds, allowing them to travel through
the lights
To the true light, where Christ is the true door.
The golden door defines how it is imminent in these things.
The dull mind rises to the truth through material things,
And is resurrected from its former submersion when the
light is seen.[117]

As Abbot Suger instructed, one should not focus on the gold or the expense—or the wealth of the institution that funded it. However, in advising one to look past the value of the gold, he made gold's value very evident. Presumably the material value of gold was quite compelling or there would have been no reason to advise against it.

Rather, Suger advised one to appreciate the noble brightness of the work and see this as a reflection of Christ, the "true light." For him, the glittering golden surface of the doors was an analogy for divine enlightenment, not an indication of earthly splendor. This was not a new concept. Light's potential for divine symbolism has been found throughout many cultures, ranging from paganism to ancient Egypt to Plato, and finally, mainly through the writings of Augustine and Pseudo-Dionysius, to Christianity.[118] As Christ himself proclaimed, "I am the light of the world."[119]

Thus, the verre églomisé decorating St. Louis's morse and the Virgin's throne could have simultaneously symbolized the royalty of his subjects as well as their spiritual virtues. Taking this duality into consideration, and considering Nicola's use of verre églomisé and its associations with reliquaries in comparison with Simone's more royal emphasis, it appears that

[117] Cited in Erwin Panofsky, *Abbot Suger*, 47-49.

[118] Eco, *Art and Beauty,* 47.

[119] John 8:12.

that glass and its lighting effects could hold different meanings depending on their specific context. Though this may be problematic for historians looking to carefully categorize and interpret the past in clearly defined ways, medieval visuality was very different from that of the modern age and could defy static definitions. For instance, early modern natural scientists paid close attention to the many different aspects of lighting and had different words for each of these. As will be discussed in more detail in chapter 6, Bonaventure wrote extensively about the distinctions between *lux*, the source of the light; *lumen*, the radiating light; and *color*, the light reflecting off solid objects. Therefore, this study does not privilege one analysis over the other but rather sees multiple possibilities, each based on its own context but all part of a complex cultural and artistic interaction.

Paolo di Giovanni Fei and Lorenzo Monaco

The next two examples, panels of verre églomisé by Paolo di Giovanni Fei and Lorenzo Monaco from later in the fourteenth century and the beginning of the fifteenth, demonstrate more complex treatments of spatial depth and coloration from earlier figurative reverse-painted glass. It also supports the notion, suggested but not explained, that verre églomisé was a particularly Sienese endeavor.[120] Thus far Nicola Pisano and Simone Martini, two of the earliest artists to use it, were indeed working in Siena. The following examples further strengthen this connection because they look at two other artists originally from this city.

[120] See Georg Swarzenski, "The Localization of Medieval Verre Églomisé in the Walters Collection," *Journal of the Walters Art Gallery* 3 (1940): 59: "No one knows, however, why in old collections… églomisé objects were labeled with an obstinate predilection as 'Sienese.'"

In his panel of the *Madonna and Child* in the Metropolitan Museum of Art from the 1370s (fig. 3.6), Paolo di Giovanni Fei inserted eight verre églomisé medallions into the frame and a larger one into the center of the panel, which follows the model of Martini's *Maestà* and visually functions as the Madonna's brooch. In a manner very different from the previously discussed works, the gilded glass is inscribed with naturalistic figurative imagery. The portraits of Saints Peter, Paul, Matthew, John the Evangelist, John the Baptist, and Catherine of Alexandria, along with the Virgin Annunciate, angel Gabriel, and Christ, are rendered in a sketch-like manner with individualized features and hairstyles (fig. 3.27). The saints in the glass medallions seem to interact with the larger, painted figures in the center; they each turn inwards and gaze tenderly towards the Madonna and Child.

In combining the supernatural sparkle of the gold leaf with carefully modeled figures, Fei's panel fused two distinct types of light, defined by Paul Hills as surface light and pictorial light. On the one hand, surface light operated as the sparkling highlights created by ambient light bouncing off smooth, reflective surfaces. The viewing of surface light, as Hills suggests, was an experience that could have been interpreted as a powerful connection between the viewer and the holy image as, at this time, it was common to associate light and spiritual enlightenment. In his discussion of the highlights of gilded panel paintings in relation to Trecento light and optics, Hills notes, "the lustre moving over the surface…could be experienced as a personal link between the worshipper's eyes and the sacred image."[121] Thus, Hills continues, when viewing a gilded panel painting, "the light of Christ's brightness could literally shine upon the eyes; and this physical light entering the eyes would have been intuitively understood as metaphor for

[121] Hills, *The Light of Early Italian Painting*, 18.

spiritual illumination."[122] Though Hills discusses panel paintings, the same concept could have also applied to the many examples of gilded glass under discussion in this chapter.

Pictorial light, on the other hand, was the illusionistic lighting within a work of art that expressed mass and depth through the description of highlights and shadows. In the aforementioned examples, instances of pictorial light are found within the shading defining the cheeks, chin, and neck of the painted Virgin in Fei's panel but could also be found in the verre églomisé portraits of the Virgin Annunciate and Gabriel within the gilded glass roundels (fig. 3.28). As she recoils from Gabriel's message, the side of the Virgin's face farthest from the viewer is heavily shadowed. In a similar way, the areas just below her eyes, lip, and chin are also modeled with shadow to create depth.

For Hills, a shift occurred around the beginning of the Trecento from an emphasis on surface light, the actual light reflecting off an artwork's surface that he saw as characteristic of the medieval aesthetic, to a greater interest in illusionistic lighting effects, light that defines space and form within a painting, characteristic of the Renaissance style.[123] Paolo di Giovanni Fei bridged these two types of light in his *Madonna and Christ* at the Metropolitan Museum. He utilized the verre églomisé in ways unlike that of either Nicola Pisano or Simone Martini and created a work of art that spoke to both artistic traditions and more innovative trends.

Lorenzo Monaco expanded on similar ideas in his *Madonna of Humility with Two Saints* in the Museo Civico of Turin from 1408 (fig. 3.7) and the fragment of *The Virgin and Child Enthroned with Saint John the Baptist and Saint John the Evangelist* from the late fourteenth

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[122] Ibid.

[123] Hills is at pains to point out that he does not mean to imply that this was the only time an interest in illusionistic space was demonstrated. For more on his observations of an interest in naturalistic space in ancient times, see Hills, *The Light of Early Italian Painting*, 9-10.

century in the Louvre's collection (fig. 3.29).[124] In both of these verre églomisé panels, the imagery inscribed into the gold leaf is highly modeled, detailed, and spatially complex. Also adding a painterly quality to the works is the fact that they use many different colors for backing. In the Turin panel, the Madonna and Child are set before a red cloth of honor that drapes according to the laws of gravity and features a complicated organic pattern. The folds in the Madonna's cloak curl around her feet in an elegant manner that rivals similar passages in Lorenzo's paintings. The floor on which the Madonna sits has detailed, illusionistic marble veining. The Christ Child holds a small bird and exhibits a contemplative stare off into the distance while the Madonna gazes out at the viewer with a sense of melancholy. The two figures of John the Baptist and John the Evangelist are equally impressive: their clothing, facial expressions, and poses are modeled on finished paintings rather than the sketch-like aesthetic of the roundels by Paolo di Giovanni Fei.

In summary, the examples of verre églomisé by Lorenzo Monaco and Paolo di Giovanni Fei embrace key aspects of the medieval tendencies of verre églomisé and combine these with current trends in naturalistic painting. Such a dramatic departure from the earlier uses of the medium by Nicola Pisano and Simone Martini illustrates the many applications of this technique possible throughout the Trecento.

Inspired by works of glass art from the medieval period, with their gem-like associations and dazzling lighting effects, verre églomisé had the ability to create visually impressive and symbolically rich effects. In its earliest uses, it adorned sculptural monuments and evoked the holy ancient origins of Christian relics. The verre églomisé in Nicola Pisano's Siena pulpit and Arca di San Domenico simultaneously dematerialized the glass and asserted the bright

[124] Laurence B. Kanter et al., *Painting and Illumination in Early Renaissance Florence 1300-1450* (New York: Harry N. Abrams, 1994), 223-226.

reflections, eloquently evoking the paradoxical nature of Christ as both spiritual and material entity. In the work of Simone Martini, the gilded glass brought earthly splendor and spiritual authority to the Virgin and St. Louis by illuminating the symbols of civic-spiritual power, namely the Heavenly Virgin's throne and the arms of Sicily and Jerusalem. For Paolo di Giovanni Fei and Lorenzo Monaco, the medium combined illusionistic space and plastic modeling with the symbolism of light and gold and, in doing so, became an expression of medieval traditions combined with naturalistic imagery.

Thus, gilded glass in general, and verre églomisé specifically, added a spiritual dimension to artworks, but the exact nature of this meaning took different forms depending on the work's context and way in which the artist used verre églomisé. By combining gold, glass, and light—each of which held rich symbolic meaning on its own—artists created works of art that went beyond a mere description of what figures and events looked like. Artists like Simone Martini and Paolo di Giovanni Fei fused naturalistic figures and illusionistic space with the supernatural presence of the divine and, in doing so, more accurately reflected the manner in which Trecento artists and audiences perceived the world around them. By incorporating glass panels in various ways, Trecento art reflected a visual culture that resonated with an abstract style, bright colors, and glimmering highlights and, at the same, expressed an interest in a new, more naturalistic approach to the visual arts. As was discussed above, many of the techniques using reflective gold such as mosaic, cosmati, the gilded background, and chrysography were inspired by Byzantine traditions. The next chapter continues to explore the Eastern influence on the Latin West's glassmaking, glass arts, and perception of transparent glass.

CHAPTER FOUR

EASTERN GLASS

The last chapter addressed the Byzantine origins of Italian gilded glass panels used in mosaics and cosmatesque works, as well as the general use of gold in panel painting. It positioned the Italian revival of verre églomisé alongside the increasing penchant for reflective and gilded surface textures, but also argued that Trecento verre églomisé was specifically suited to the contemporaneous taste for more naturalistic imagery. This chapter examines other ways in which "Eastern," that is, Byzantine and Islamic glass artworks and ideas impacted Italian art and production. As described in more detail below, Islamic artists and craftsmen reinvigorated glass production in the Latin West with their techniques, which were extensions of the ancient Roman tradition. At the same time, Muslim scholars were the Latin West's main source for ancient optical theory as well as the most innovative commentators of the age, making new additions to the field of optics. Finally, some of the most significant objects of exchange, such as relics, were entering the West in glass and crystal vessels. This chapter thus argues that the collective impact of Eastern glass reliquaries, optical science, and glassmaking technology shaped the fourteenth-

century use and reception of glass in devotional art, contributing to the formation of Trecento visuality.

To explore the relationship between optical science, the viewing of relics, and vitreous media, this chapter examines artworks featuring glass, and its more precious prototype, crystal, as a point of intersection because, as will be discussed, many of the prized eastern treasures used glass or crystal in ways that promoted an intense visual and spiritual experience. This study suggests that Italian reception of Levantine glass and crystal went beyond mere spolia and was informed by the simultaneous influx of Arabic optical treatises and technology.[125] The conflation of such cultural trends produced a revival of artistic glass, created an association between glass and the concept of vision, and contributed to the use of glass for the veneration of relics.

In the last decade, scholarship considering the impact of Islamic art, technology, and ideas on the development of the Italian Renaissance has steadily increased. The prejudiced view that the Italian Renaissance was the rebirth and continuation of the Greco-Roman tradition had been held since at least the days of Petrarch, when the great poet noted, "I shall scarcely be persuaded that anything good can come from Arabia."[126] Instead of seeing Muslim scholars as

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[125] This does not mean to imply that these objects were not also valued for their exotic or luxurious quality, merely that this was not their sole value. For more on the luxury value of these objects see Rosamond Mack, *Bazaar to Piazza: Islamic Trade and Italian Art, 1300-1600* (Berkeley: University of California Press, 2002), 7.

[126] Petrarch, *Letters of Old Age (Rerum senilium libri),* vol. 2, trans. Aldo S. Bernardo, Reta A. Bernardo, and Saul Levin (New York: Italica Press, 2005), 471. The quote comes after a debate about a healthy diet in a letter to the physician Giovanni Dondi of Padua. The full passage indicates that while Petrarch looked upon Arabic wisdom unfavorably, his more learned contemporaries did not necessarily feel the same way.

> Before closing, I ask a special favor of you: that you keep your Arab authorities in banishment from any advice to me; I hate the

actively shaping and contributing to the development of Western thought, Petrarch and others saw them merely as translators.[127] In reality, Islamic territories were far more advanced than the civilizations in the Latin West during the medieval period and there were extensive cultural contacts between the East and the West.[128]

Recent political interest in the Near East, as well as the more diverse approaches available across academic disciplines, have created increased interest in Islamic art and culture in both academic scholarship and museums. A few of the more influential examples include the recent renovation of the Metropolitan Museum of Art's Islamic Galleries and the following exhibitions: *Caliphs and Kings: The Art and Influence of Islamic Spain* at the Freer and Sackler

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> entire race. I know that the Greeks were once the most ingenious and eloquent men; they produced many philosophers, the greatest poets and outstanding orators and mathematicians. That part of the world gave birth to the chief physicians; but you know what kind of physicians the Arabs are, I know what kind of poets they are. There is nothing more charming, softer, more lax, in a word, more base. And although the minds of different races are suitable for different things, yet, as you like to say, intelligence shines forth generally. But why say more? I shall scarcely be persuaded that anything good can come from Arabia; but you learned men, through some strange mental weakness, so celebrate them with great and, unless I am mistaken, undeserved trumpeting, that I remember hearing that man I recently mentioned, Giovanni da Parma, tell an audience of doctors, who upheld his words, that if there were any Latins on a par with Hippocrates, he could speak, to be sure, but unless he were Greek or Arab, he would not dare write, and if he did, he would be scorned. These words not only scorched my heart like a nettle, but stuck there like an awl; and how much more deeply it would have struck if I had happened to be a student of medicine! Surely the pain would have had enough force to make me throw away my books.

[127] Nancy Bisaha, "Petrarch's Vision of the Muslim and Byzantine East," *Speculum* 76 no. 2 (April 2001): 284-286.

[128] For trade connections see Mack, *Bazaar to Piazza*, 15.

Galleries in 2004, *Artistic Exchange: Europe and the Islamic World* at the National Gallery of Art in 2004-5, *The Arts of Fire: Islamic Influences on the Italian Renaissance* in 2004 at the Getty Center, and *Venice and the Islamic World 828-1797* at the Metropolitan Museum in 2007. Alongside these contributions by museums, the scholarship of Avinoam Shalem, Stefano Carboni, Deborah Howard, and Rosamond Mack, among others, has also made significant contributions to a broader and more informed understanding of the encounter between Islamic and Renaissance art.[129]

Due to expanding scholarly approaches, it is now common practice to both acknowledge and analyze indications of Islamic influence in the works of artists ranging from Giotto to Giorgione. For instance, for Rosamond Mack, the use of pseudokufic script in famous works such as Duccio's *Rucellai Madonna* signaled the Italian artists' familiarity with the fine textiles from the Near East and suggested that the Italian viewer understood the value of such fine cloth coming into Italy via trade and that artists used it to adorn revered figures in their paintings.[130]

As with the work of Mack, Shalem, Carboni, Howard, and Holger Klein, this study looks to go beyond the mere visual presence of Islamic motifs and explore the ways in which eastern imports were assimilated into the Latin West. What follows is an examination of the dialogue between various cultural trends in the Latin West, but particularly Italy, during the late medieval

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[129] Avinoam Shalem, *Islam Christianized: Islamic Portable Objects in the Medieval Church Treasuries of the Latin West,* rev. 2nd ed. (Frankfurt am Main: Peter Lang, 1998); Stefano Carboni, *Venice and the Islamic World, 828-1797* (New York: Metropolitan Museum of Art, 2007); Stefano Carboni and David Whitehouse, *Glass of the Sultans* (New York: Metropolitan Museum of Art, 2001); Deborah Howard, *Venice and the East: The Impact of the Islamic World on Venetian Architecture, 1100-1500* (New Haven, CT: Yale University Press, 2000); Rosamond Mack, *Bazaar to Piazza: Islamic Trade and Italian Art, 1300-1600* (Berkeley, CA: University of California Press, 2002). See also Lisa Jardine and Jerry Brotton, *Global Interests: Renaissance Art between East and West* (Ithaca, NY: Cornell University Press, 2000).

[130] For more on Duccio's *Rucellai Madonna* see Mack, *Bazaar to Piazza*, 56-58. For more on the general impact of Eastern textiles see ibid., 35.

and early Renaissance periods. The focus of this chapter shifts between various aspects of the Latin West's reception of Eastern imports in order to demonstrate the related nature of Eastern glass reliquaries, Islamic glassmaking techniques, and Arabic optical theory. Ultimately, it works to identify a wide range of factors that contributed to the evolution of Trecento visuality and devotional art.

The Latin West and the Levant

To more fully understand the Trecento reception of Levantine glass, a brief overview of the intercultural interactions between East and West is helpful. The relationship between the two is a complex one and reaches at least as far back as ancient Rome, when the cultural heritage of the Latin West and that of Byzantium were united. In the centuries following the fall of Rome, the Byzantine Empire flourished while the western territories experienced a period of political instability beginning in the fifth century and lasting until Charlemagne. During this time, contact between the Latin West and Byzantium was rooted in their shared religion but also took place through the Byzantine presence on the Italian peninsula at such locations as Ravenna.

The strong religious ties meant that the Eastern and Western churches both venerated Christian relics and holy sites. As the Byzantine emperor possessed many of the most important relics of the Passion of Christ, he was the gatekeeper for the Latin West's access to them prior to the 1204 Sack of Constantinople. He demonstrated his powerful position by sending Western dignitaries gifts of relics, determining whether a visitor was granted access upon their visits to

Constantinople, and presenting Western hosts with relics as gifts upon his visits to Europe.[131] Two of the more famous episodes of Western visitors to the Byzantine court included Henry the Lion and King Louis VII of France, who visited the Emperor Manuel I Komnenos on their journeys to the Holy Land.[132] At the Byzantine court, Louis VII and Henry could have hoped to see such revered relics as the column and whip of Christ's flagellation, the wood and nails from the True Cross, and many others.

From its inception in the seventh century, the religion of Islam grew quickly in terms of geographical territory and cultural influence and, although very different in nature from those with Byzantium, the links between the Latin West and the various Islamic dynasties were also extensive and continuous.[133] In one sense, for the medieval Christians, the believers of Islam were the infidel who held control over the birthplace of Christ and other holy Christian sites; many in the Latin West interpreted their numerous military victories against the Christians as a warning from God. In another sense, Muslims were highly desirable trading partners, controlling access to the major trade route from Europe to Asia. They were also some of the period's most skilled craftsmen, producing many of the early modern world's finest luxury goods. In the eyes of medieval Christian kings, they were indispensible mercenary soldiers, while for the chivalric poets, they symbolized a worthy enemy. In the case of Christians living on the Iberian peninsula or in the crusader states, they could even be one's neighbors.[134] Finally, as will be described

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[131] For an extensive list of relic exchanges with literary documentation see Holger Klein, "Eastern Objects and Western Desires: Relics and Reliquaries between Byzantium and the West," *Dumbarton Oaks Papers* 58 (2004): 284-293.

[132] Ibid., 287.

[133] For specific details on the gift exchanges between Islamic dynasties and the Latin West see Shalem, *Islam Christianized*, 37-49.

below, Muslim scholars were also the source for much of the Latin West's information on optical science, glassmaking techniques, as well as a host of other ancient learning.

However, as David Nirenberg notes, despite these many different relationships and the vast knowledge of Islam gained through them, the medieval view of Islam as un-Christian and thus heretical remained constant.[135] To a large degree, the more the Latin West learned about Islam, the more they used this knowledge to further their preexisting views.[136] By the mid-twelfth century, the Latin West had their first version of the translated Qur'an, along with several other Arabic texts, due to the efforts of Peter the Venerable of Cluny.[137] However, the margins of the translated versions of the Qur'an usually contained instructions as to the proper Christian interpretation of this text.

One of the most important aspects of the Latin West's relationship with both Byzantium and Islamic territories was geographic. As Christian Europe established greater political stability, wealth, and unification against the common enemy of Islam, the Latin West aimed to reclaim what they saw as their rightful spiritual heritage. The medieval Christians set their sights on the *loca sancta* and its precious physical connection to Christ, his saints, and their relics through the organization of crusades and pilgrimages. An intensely compelling aspect of any

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[134] For a further discussion and bibliography on the many ways the medieval Christians related to Muslims, see David Nirenberg, "Christendom and Islam," in *Christianity in Western Europe c. 1100-c. 1500* (Cambridge: Cambridge University Press, 2009): 149-169 but especially 160-163. Nirenberg notes the many different groups of Christians and Muslims at this time (p. 149) and how the Christian relationship with Islam solidified the various Christians into a unified body (p. 156-158).

[135] Nirenberg's discussion applies to the views of medieval Christians from the seventh to the fourteenth centuries. Ibid., 151.

[136] Ibid., 150-153.

[137] Ibid., 153.

pilgrimage or crusade was to come into contact with the landscape of Christ, but it was also highly desirable to return with a souvenir of this contact. For this reason, the present discussion of glass objects focuses special attention on Eastern glass objects that functioned as reliquaries from the Holy Land. There is a large body of literature on the many ways Levantine luxury objects shaped Western taste, but, as this study is concerned with glass and its intersection with optics, it will examine glass vessels that contained some of the most valuable objects one could visually encounter: relics.

Venice

One of the most illustrative examples of the strong connections between the Levant and the Latin West lies in the complex intercultural relations between Venice, Byzantium, and Islamic territories.[138] The relationship between Venice and the eastern Mediterranean dated back to at least the early ninth century when the city was able to retrieve, among other things, the venerated relics of St. Mark from Alexandria, which was then under the control of the Abbasid Dynasty.[139] At the same time, ca. 829, the Byzantine emperor sent Venice the so-called "Chair of St. Peter" (fig. 4.1) as payment for their help in fighting against the Arabs for control of Sicily.[140]

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[138] Pisa had extensive trade contacts as well, especially with northern Africa from where they obtained loot including a large number of ceramics, which were inset into the façade of the late-twelfth-century San Miniato, Pisa. Mack, *Bazaar to Piazza*, 3.

[139] Carboni, *Venice and the Islamic World*, 13. The governor in power was Abdallah ibn Tahir ibn al-Husayn. The Doge was either Giustiniano Partecipazio (r. 827-829) or Giovanni Partecipazio (r. 829-837).

[140] Carboni, *Venice and the Islamic World,* 13-14. According to Carboni (ibid., 34), the two merchants who secured the relics of St. Mark were recorded as Bono da Malamocco and Rustico

These two early examples of international exchange—that is, the transfer of the relics of Saint Mark and the donation of the so-called "Chair of St. Peter"—demonstrate key components of Venice's relationship with Islamic and Byzantine territories. Firstly, there were sustained contacts between Islamic and Christian territories despite different religious beliefs. Secondly, the important practice of gift-giving exposed Venetians to new artistic trends and inspirations. For instance, in the case of the "Chair of St. Peter," the backrest of the stone throne featured incised verses from the Qur'an in elaborate Islamic script. Such script, which would come to infiltrate Italian artistic production, may have been perceived as the script of the Holy Land in Biblical times.[141] Rosamond Mack supports this theory by citing the fact that Assisi frescoes feature a church father reading what appears to be pseudokufic script and, in the scene with the *Crib of Greccio,* one finds an Islamic lunar calendar with a similar script.[142]

The receipt of the relics of St. Mark inspired the Venetian Doge Giovanni Partecipazio to construct St. Mark's Basilica, decorating it with sumptuous Italo-Byzantine mosaics, some of which were even made by imported Greek mosaicists. In fact, it was this complex artistic tradition, imbued as it was with Islamic designs and glass techniques, that led Stefano Carboni and Carlo Bertelli to assert that Venetian glassmakers were responsible for the verre églomisé that Guglielmo incorporated into his pulpit for San Giovanni Fuorcivitas discussed in the

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da Torcello. The earliest record of the transfer of these relics is found in the ninth-century *Cronaca veneziana* by Giovanni Diacono. For more on this, see ibid.

[141] Mack, *Bazaar to Piazza*, 51-54.

[142] Ibid., 52-54.

previous chapter (fig. 3.25).[143] The influence of the Venetian craftsmen may therefore help explain why Guglielmo's gilded glass looks so different in style from that by Nicola Pisano.[144]

Driving much of Venice's interest in the Levant were the advantageous trading opportunities it presented. Venice's trade with the East was even largely sustained despite an embargo ordered by Pope Nicholas IV in 1291.[145] The extensive networks between Venice and the East resulted in many Venetians living in Islamic territories such as the city of Alexandria and Islamic rulers sending ambassadors to the West.[146] However, despite their beneficial economic and artistic ties, when called to participate in the crusade effort, the Venetians answered. In a particularly illustrative example of what Stefano Carboni defines as Venice's "pragmatic" relationship with the Levant, what began as an attempt to wrest the holy city of Jerusalem from the Muslims ended with the looting of the Imperial Treasury of the Eastern Christians.[147] The wide-ranging benefits gained from the 1204 Sack of Constantinople included prizes such as the famous bronze horses that were to grace the top of St. Mark's, a load of

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[143] Carboni, *Venice and the Islamic World,* 341 notes, "Bertelli identified this fragment, originally part of the 1270 pulpit of the Church of San Giovanni Fuorcivitas in Pistoia, as one of the best examples of gilded glass from the 13th century. He also convincingly argued that Venetian craftsmen created its glass decoration, basing his statement on a comparison with illuminated borders of contemporaneous manuscripts and with details of local architectural decoration, but especially because of Venice's unique access to, and knowledge of, geometric patterns of Islamic origins."

[144] Such an international collaboration also occurred between the caliphs of Cordoba and Byzantine craftsmen. For more on this, see Eve Borsook, *Medieval Mosaics: Light, Color, Materials* (Milan: Silvana, 2000), 12.

[145] Mack, *Bazaar to Piazza*, 16 notes that Venice was fined for sending ambassadors to discuss trade matters to Alexandria in 1302 and Syria in 1304.

[146] On Venetians living abroad see Mack, *Bazaar to Piazza*, 16 and Carboni, *Venice and the Islamic World,* 16. On Eastern diplomatic visitors to the west see ibid., 16 and Shalem, *Islam Christianized,* 44-45.

[147] Carboni, *Venice and the Islamic World,* 15-16, 19.

tesserae, and, as will be discussed in further detail below, glass and crystal objects such as the *Cup with Mount* (fig. 4.2) and *the Rock Crystal Vase with Mount* (fig. 4.3).[148]

Works such as these inspired a significant growth in the Venetian glass industry over the course of the thirteenth century. In addition to adopting Islamic glassmaking techniques and stylistic features, the Venetians also imported large amounts of raw materials needed to make glass.[149] Thus, in addition to the influence of Byzantine mosaics and cosmati discussed in the last chapter, Islamic glass objects and glass-making techniques significantly impacted western artistic practice.

Eastern Glass and Crystal Reliquaries in the West

Having established that there were many different types of contact possible between the Latin West and the Levant, it is useful to look closer at some glass and crystal objects entering Europe during the medieval period and the potential associations they might have held, before examining the developments during the thirteenth and fourteenth centuries. These vessels entered the West through many different routes; some were given as gifts, some brought back as pilgrimage souvenirs, some were purchased after the dispersal of the Fatimid treasury in 1061, and some were either looted or stolen.

Without an elite connection to the Byzantine court that could be rewarded by the gift of a relic, one's best opportunity to obtain relics was to take a pilgrimage to the Holy Land. Despite

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[148] Venice's reward also included three-eights of the Peloponnesus. Carboni, *Venice and the Islamic World,* 19. The Byzantine treasury also included many pieces of Islamic luxury arts; see Shalem, *Islam Christianized,* 45. For more on the shipload of tesserae that entered Venice, see Borsook, *Medieval Mosaics*, 13.

[149] Carboni, *Venice and the Islamic World*, 22.

changing political fortunes and increasing expense and danger, European Christians continually made pilgrimages to the Holy Land beginning in at least the fourth century.[150] Spiritual tourists to the *loca sancta* were interested in making physical contact with the Biblical landscape and, if possible, in bringing back a tangible souvenir of this contact. In many cases, pilgrims met this need with secondary relics, or "contact relics," that is, a substance that had made physical contact with saintly bodies, rather than an actual fragment of holy remains.

Examples of popular secondary relics included oil or other substances that had been used to anoint primary relics. After the ritual anointing, the oil was gathered into small vessels and sold to pilgrims.[151] Other times, the vessels were filled with oil and placed near the primary relic during the ceremony and distributed to visitors after.[152] Among the many secondary relics that were available to pilgrims and could be easily transported in flasks were water from the Jordan river; oil from the Holy Sepulcher; balsam from Matarieh, which marked the spot where the Holy Family had spent time on their flight into Egypt; oil-like "tears" cried by an icon of St. Mary at Serdinale; oil from lamps in sacred settings; wax from candles; water from holy sites; and earth that had come into contact with revered figures, such as the soil said to have been stained by the blood of the innocents of Bethlehem.[153]

There had been a long tradition of collecting relics as souvenirs and extant evidence demonstrates that as early as the later sixth century, Christian pilgrims acquired secondary relics

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[150] Diana Webb, *Medieval European Pilgrimage, c. 700 – c. 1500* (Gordonsville, VA: Palgrave Macmillan, 2002), 2-3.

[151] Ibid.

[152] Ibid., 19.

[153] Ibid, 18-24.

such as sanctified oil in pilgrim flasks, or *ampullae*, made from glass.[154] An anonymous pilgrim writing in 570 described taking sanctified oil from the church of the Holy Sepulcher and other holy sites of Jerusalem, indicating the widespread nature of this practice by the later sixth century.[155] Dan Barag's research suggests pilgrims transported secondary relics to the West in glass bottles with Christian, Jewish, and neutral imagery (fig. 4.4). Barag argues that these objects were mass-produced by the same operation located in or around Palestine using the mold-blown technique and used to carry oil from holy sites.[156] The Christian imagery consists of alternating crosses and symbols that resemble book covers, which Barag argues referred to the Scriptures and site of Golgotha and the Church of the Holy Sepulcher.[157] Barag's study and the numerous extant glass bottles and jugs indicate that the colors of these glass vessels varied, but brown and light bluish-green were two of the most popular colors. Most of the glasses in good condition, regardless of their color, display a significant degree of translucence.[158]

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[154] Dan Barag, "Glass Pilgrim Vessels from Jerusalem: Part I," *Journal of Glass Studies* 12 (1970): 47-48. For more on this, see idem, "Glass Pilgrim Vessels from Jerusalem: Parts II and III," *Journal of Glass Studies* 13 (1971): 45-63 and J. Wilkinson, "Christian Pilgrims in Jerusalem during the Byzantine Period," *Palestine Exploration Quarterly* 108 (1976): 84.

[155] Barag, "Glass Pilgrim Vessels: Part I," 47-48 and Shalem, *Islam Christianized*, 18-19.

[156] Barag, "Glass Pilgrim Vessels: Part I," 46-48 cites Goodenough's observation that many such vessels were found in graves, indicating that they may have served as a funerary offering. However, it should be noted that the vessels and their contents could have certainly been both relics collected at holy sites and funerary offerings.

[157] Ibid., 44 notes, "To sum up, all four classes (or molds) of the hexagonal vessels belong to a single iconographic group. The three types of crosses occur in a set order. That on the first side has been identified with the cross actually standing on Golgotha until 614; the cross on the third side represents the cross standing on the Omphalos. The cross on the fifth side represents concepts connecting the "Life-Giving Cross" and the Tree of Life with the new Paradise—Golgotha and the Holy Sepulchre."

[158] As with the discussion of gilded glass in the last chapter and all discussions of glass works, the extant evidence likely represents only a fraction of this fragile material's original production.

Pilgrimage accounts support the notion that the practice of obtaining glass flasks with secondary relics continued through to the fourteenth century. In his description of his travels to Hebron in 1384, Lionardo Frescobaldi recounts:

> And there is in the said city a mosque of the Saracens, formerly a Christian church; and in a wall where the high altar stood, is a monument, a face of which is visible outside, and the rest is in a mosque, which the Christians cannot enter; and if one entered he should have to renege our faith, or be cut in two at the middle. In this monument is the body of Adam, and that of Abraham and Isaac and Jacob, and beside that is another wherein were buried the wives, Eve and the others. From the grave of the said patriarch a certain oil is got, in which the Saracens, the Jews and all the Christians of these parts, as we also, have great faith, and some of us got some of it.[159]

Frescobaldi does not give us a description of what these flasks looked like or from what material they were made but it is likely they were made from glass. Though it is true that *ampullae* were also made of materials like metal and clay, in the same breath that the pilgrim describes the vessels he also relays the renown of Hebron for its fine glass production. As Frescobaldi explains, Hebron "is a very beautiful city and a beautiful country, and very industrious and they do there the finest work in glass, and more than in any place I have been."[160] From these sources one gets a personal account of the renowned glassmaking centers and the multicultural scene in the Near East. Further attesting to the rich cultural interchange of this region, Muslims also

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[159] Leonardo Frescobaldi, Giorgio Gucci, and Simone Sigoli, *Visit to the Holy Places of Egypt, Sinai, Palestine, and Syria in 1384* (Jerusalem: Franciscan Press, 1948), 68. This source also described the pilgrimage of Niccolo da Poggibonsi, whose trip to the Holy Land occurred around 1346-50.

[160] Frescobaldi, Gucci, and Sigoli, *Visit to the Holy Places,* 68. Niccolo da Poggibonsi also remarks on Hebron's glass industry and that of Damascus, see ibid., 58, 79.

adopted the practice of collecting sacred substances and were, at times, the very artists crafting the vessels for the Christian pilgrim market.[161]

Glass flasks such as those studied by Barag, those mentioned by Trecento pilgrimage accounts, and others like them, would not only have been seen as exotic or beautiful, but their translucency allowed the medieval pilgrim the unique opportunity to simultaneously verify the presence of the relics, protect them, and make visual contact with them. The translucent or transparent glass vessels could have therefore offered something that *ampullae* made from opaque materials such as clay, silver, or gold could not: a visual connection with the holy relic.

In a similar way to the glass *ampullae*, flasks made of rock crystal (fig. 4.5)—glass's more precious but closely related prototype—also provided both the aesthetic beauty and practical benefits just discussed. Oftentimes these crystal vessels bore Arabic inscriptions that could have further emphasized their connection to the Holy Land. As Rosamond Mack argues, these inscriptions did not necessarily connote a connection to Islam; rather, as in the case of the so-called "Chair of St. Peter," Arabic inscriptions may have been interpreted as the local script of the Holy Land and thus the script in use during the time of Christ.[162] Though it has been argued that they were originally secular perfume bottles converted into reliquaries by the European treasuries, which may be true for some, Avinoam Shalem suggests that some of the crystal flasks were made specifically to house secondary relics for pilgrims, making them reliquaries from their inception.[163] He argues that they were ideally suited to serve as reliquaries based on their

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[161] Shalem, *Islam Christianized*, 17.

[162] Mack, *Bazaar to Piazza*, 52-54.

[163] Shalem, *Islam Christianized,* 30-31; idem, "Islamic Rock Crystal Vessels—Scent or Ampullae?", *Bamberger Symposium: Rezeption in der islamischen Kunst,* Beiruter Texte und Studien 61 (1999): 289-299.

material value, transparency, and place of origin.[164] He also lists the glass and crystal bottles in Western treasuries that are said to contain precious relics from the Holy Land.[165] Finally, Shalem points out that perfumed substances were used in a variety of rituals and therefore when analyzing perfume flasks it is important to consider that the fragrant substance they contained may have had religious associations.[166]

Attesting to the revered nature of these glass and crystal reliquaries was the treatment they received upon their arrival in the West. They were donated to church treasuries as *ex votos*, acquired by wealthy individuals through the luxury trade, obtained as war booty, or given as gifts by foreign dignitaries.[167] Abbot Suger noted an example of how a Sassanian vessel might have found its way into a treasury:

> Still another vase, looking like a pint bottle of beryl or crystal, which the Queen of Aquitaine had presented to our Lord King Louis as a newly wed bride on their first voyage, and the King to us as a tribute of his great love, we offered most affectionately to the Divine Table for libation. We have recorded the sequence of these gifts on the vase itself, after it had been adorned with gems and gold, in some little verses: 'As a bride, Eleanor gave this vase to King Louis, Mitadolus to her grandfather, the King to me, and Suger to the Saints.'[168]

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[164] Ibid., 17-18.

[165] Ibid., 18-31.

[166] Ibid., 23, 30.

[167] For more on the luxury trade, see ibid., 93-128; for war booty, ibid., 72-92; and for gift giving, ibid., 37-55. For more on some small phials listed in fourteenth-century papal inventories which were probably pilgrimage souvenirs, see Mack, *Bazaar to Piazza*, 116.

[168] Erwin Panofsky, *Abbot Suger: On the Abbey Church of St.-Denis and its Art Treasures* (Princeton: Princeton University Press, 1979), 79. For the designation of this vessel as Sasanian see, Shalem, *Islam Christianized,* 129; for more on objects entering the treasury of Saint-Denis, see Philippe Buc, "Conversion of Objects: Suger of Saint-Denis and Meinwerk of Paderborn," *Viator:Medieval and Renaissance Studies* 28 (1997): 99-144.

Shalem points out that when these portable repositories were converted into sacred objects of display, aspects of their design related to their function were lost in the process.[169] The weight of the ampullae hanging around one's neck or from one's belt, for example, could no longer be appreciated. Also inaccessible was the tactile sensation of the faceted angles of the cut crystal. However, in place of these characteristics, new aesthetic appreciations of the decorations could be discovered. For instance, in the *Reliquary with the Tooth of St. John the Baptist* in the Art Institute of Chicago (fig. 4.6) and the *Cross of St. Nikomedes of Borghorst* (fig. 4.7), any form of tactile contact is denied. Instead, the object offers one the opportunity to appreciate the medium's transparency and the artistry of the engravings. This study agrees with Shalem's assessment of their conversion and would like to extend it by suggesting that, in addition to the newly appreciated *decorative* elements of the vessels, their *medium*, or materiality, was now more prominently on display and the visual connection with the relics more important. It is for this reason that a discussion of the materials of glass and crystal can be of use.

Eastern Glass and Crystal in the West: Production and Techniques

With an understanding of how glass reliquaries entered the Latin West, it is informative to consider the ways the media of glass and crystal may have also been perceived as having Eastern origins and how they might have enhanced one's relationship with the relics. Though viewers in the medieval West appreciated the aesthetic qualities of rock crystal, they did not locally produce

[169] Ibid., 131. Shalem refers to this process as one of "aestheticization."

artistic carved crystal until the late twelfth century.[170] Islamic territories, on the other hand, were producing high-quality artistic carved crystal by the ninth century under the Fatimids of Egypt.[171] European interest in Fatimid carved crystal was greatly fueled after they obtained many crystal vessels—and glass vessels imitating crystal ones—from the dispersal of the Fatimid treasury in 1061.[172] As there were also many pieces of Fatimid crystal in the Byzantine imperial treasury, more examples entered European collections again after the 1204 Sack of Constantinople.

Muḥammad ibn Aḥmad Bīrūnī (Beruni), a Muslim polymath writing in the early eleventh century, described various aspects of the Eastern crystal industry in his book on mineralogy, *On Precious Stones*. According to Beruni, crystal was:

> "brought from the island of Zanj and other islands to Basrah, where vessels are made. Large and small pieces are collected at one place. Instructions are tagged upon pieces that are to be cut and shaped and the types of vessels that are to be made from them. They are then handed over to the artisans who follow the instructions and collect high wages. … It is brought from Kashmīr also. Some sections are uncut and some are used in the making of vessels and utensils, goblets and cups, chess pieces and counters, and pieces as large as the soap-nut. But this variety does not approach the Zanjī kind nor is the quality of the workmanship of these people (i.e., of Kashmīr) as finished as that of the Basrans. Its sections are found in mountains as well. It is found in plenty in Wakhān and Badakhshān but is not exported. Al-Kindī writes 'The best crystal is the A'rābī which is picked from the desert

[170] Shalem, *Islam Christianized,* 146. Shalem makes the same point at ibid., 58. For more on the history of carved rock crystal, see Genevra Kornbluth, *Engraved Gems of the Carolingian Empire* (University Park, PA: Pennsylvania State University Press, 1995).

[171] Though the Fatimid Dynasty is associated with the perfection of the crystal vessels, Shalem cites documentary evidence that there was an earlier tradition dating back to at least the ninth century. Ibid., 26.

[172] For more on the Fatimid Treasury's dispersion, see chapter 3, "The Dispersion of the Fatimid Treasury," in Shalem, *Islam Christianized,* 56-66. For more on the treasury in general, see Helen Romberg, "The Fatimid Treasury: Content and Function" (Ph.D. diss., University of Oxford, 1985). For an example of Fatimid glass imitating crystal see the *Buckley Ewer* from the Victoria and Albert Museum, London mentioned by ibid., 114.

> among the gravel. It is found encapsulated in a thin turbid sheath and weighs up to two *ratls*. It is similarly picked from Serandīb, but it is less transparent than the A'rābī.'[173]

Beruni's quote clearly identifies from where the raw material comes as well as one of the most important centers of crystal workmanship, namely, the Middle Eastern city of Basrah.

Glass too was originally developed in the East and imported into the Latin West prior to the thirteenth century. The earliest records of glass indicate the medium was invented near Egypt or Mesopotamia around 3000 BCE. From there it spread both east and west with a particularly high point of production and quality in ancient Rome.[174] After the fall of Rome, European glassmaking slowed considerably. However, Islamic artists were especially advanced in terms of both utilitarian and artistic glass production from the seventh century onwards.[175]

After the Muslim conquest of the eastern Mediterranean, Islamic artists inherited Byzantine territories, craftsmen, artistic traditions, and production centers, but within two hundred years they had made these traditions their own. Glass production from the first Islamic dynasty, the Umayyads (661-750), was in many ways a continuation of Byzantine, Roman, and Sassanian traditions and is therefore difficult to distinguish it from pre-conquest works.[176] However, by the ninth and tenth centuries, Islamic glassmakers experimented with sandwich-gold-glass and cut-glass techniques. The innovative luxury glass items produced in the Abbasid

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[173] Muḥammad ibn Aḥmad Bīrūnī, *The Book Most Comprehensive in Knowledge on Precious Stones: Al-Beruni's Book on Mineralogy,* ed. Hakim Mohammad Said (Islamabad: Pakistan Hijra Council, 1989), 159-160. Elsewhere (p. 158) Beruni writes that crystal had other uses too, as "it is quite hard and can be employed for cutting jewels. It is for them what steel is for iron."

[174] Alan Macfarlane and Gerry Martin, *Glass: A World History* (Chicago: University of Chicago Press, 2002), 10-26 and 99-121.

[175] Carboni, *Venice and the Islamic World*, 253; Macfarlane, *Glass,* 10-26 and 99-121.

[176] Carboni and Whitehouse, *Glass of the Sultans*, vii, 3.

capital of Baghdad were sought-after commodities in Europe and Asia.[177] By the thirteenth and fourteenth centuries, Islamic craftsmen based in Syria had perfected the techniques of gilding and enameling glass, further fueling their export industry.[178]

At this time, Venice began to revive glass production in the Latin West through its extensive trade and diplomatic relations with Islamic territories.[179] In addition to artistic forms and technical procedures, Venice also had access to raw materials needed to make glass. Venice imported ash and alkali from Syria, affording them the opportunity to make quality glass from scratch.[180] They also imported cullet, or broken pieces of Islamic glass, which could be melted at a lower temperature to more easily and efficiently make glass; the import of cullet peaked around the middle of the thirteenth century.[181]

In addition to raw materials, Venice also benefited from the presence of Eastern artists and craftsmen who brought with them innovative techniques. During the late thirteenth century, Venetian documents indicate the presence of "a Greek from Morea in the Peloponnisos" and "Bartolomeus and his brother Donino from Dalmatica," who were likely skilled in eastern techniques.[182] Evidence of Venice's adaptation of Syrian techniques is exemplified by the late–

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[177] Mack, *Bazaar to Piazza*, 4.

[178] Ibid., 113. This leading role was put to an end by the "Timurid devastation of 1401, where the glass furnaces of Damascus were burned and master craftsmen taken to Samarkand," along with decreased demand and the rise of Chinese products.

[179] For trade connections despite crusades see Mack, *Bazaar to Piazza*, 15. For Venice's relation to the East beginning in the ninth century see Carboni, *Venice and the Islamic World,* 16-17.

[180] Mack, *Bazaar to Piazza,* 113.

[181] Attesting to the large amount of cullet entering Venice is the fact that a treaty from 1277 between Doge Giacomo Contarini and Bohemond VII, prince of Antioch, describes duties placed on cullet from Tripoli. Ibid., 113.

thirteenth- or early-fourteenth-century *Aldrevandin Group*, a group of drinking glasses made from transparent glass decorated with enamel (fig. 4.8).[183] When one compares the *Aldrevandin Group* with Syrian examples, such as the pair of beakers from the Walters Art Museum (fig. 4.9), it becomes apparent that the Venetian artists closely followed Eastern models in shape, style, and techniques. Attesting to the growth of their city's glass production is the fact that the Venetians had to move the glass factories to the island of Murano for safety reasons.[184]

Archaeological evidence also supports the Venetian production of colorless glass; many fragments of transparent glass dating to the Duecento and Trecento were found near Venice. [185] That Trecento Venetians were producing high-quality colorless glass is further suggested by documentary evidence. A treatise from the late-thirteenth century mentions agents used to decolorize glass being imported from Spain and a decree from April of 1300 bans imitation rock crystal.[186] That some glassmakers sought to imitate crystal—and their imitations were so good that they needed to be restricted—is of great interest to this study because it demonstrates the similar qualities shared by glass and rock crystal, a point to which this essay will return shortly.[187]

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[182] Mack, *Bazaar to Piazza*, 116.

[183] Ibid., 114.

[184] Carboni, *Venice and the Islamic World,* 20-21.

[185] Ibid.

[186] Ibid.

[187] The colorless glass mentioned here was greatly improved upon in the fifteenth century by the glassworker Angelo Barovier. For more on this, see W. Patrick McCray, "Glassmaking in Renaissance Italy: The Innovation of Venetian Cristallo," *Journal of the Minerals, Metals, and Materials Society* 50 no. 5 (May 1999): 14-19. While this later and more highly refined type of glass, usually referred to as cristallo, was much more clear and blemish-free than earlier colorless

Visible Relics in Byzantine and Western Reliquaries

With the Latin West's growing capability of producing their own glass vessels and the establishment of a crystal-carving tradition, Europe saw an increase in reliquaries with transparent glass and crystal showing visible relics in the late twelfth and thirteen centuries.[188] The West's rising interest in directly viewing relics had many causes but a contributing factor was likely the influx of Byzantine reliquaries entering the West both before and after the Sack of Constantinople. Although the Byzantine reliquaries did not frequently feature an extensive use of glass or crystal, they often offered the viewer direct visual access to the relics, as in the examples of the *Limburger True Cross Reliquary* (fig. 4.10) or *The Skull of St. James the Younger* (fig. 11). In the former, the privileged viewer could slide the lid open to reveal the sacred wood and then open the smaller doors for access to the secondary relics. In the latter, the skull has been embellished and decorated but not covered or contained.

For Holger Klein, the Byzantine influence on Italian reliquary production was first demonstrated in the late twelfth century with works such as the *Stavelot Triptych* (2.7) and *The*

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glass, the fact remains that there were restrictions on crystal imitations and a treatise mentioning a decolorizing agent in the Trecento.

[188] For a comment on the increasing visibility of relics see Klein, "Eastern Objects and Western Desires," 305 n. 125 where he notes, "In making the relics visible, the Trier artists followed a trend attested in western art from the later 12th and early 13th century onward." For a similar argument see Arnold Angenendt, "Relics and Their Veneration," in *Treasures of Heaven: Saints, Relics, and Devotion in Medieval Europe* (New Haven, CT: Yale University Press, 2010): 25-26. For more on the issue of the visible relic, see Hans Belting, *Likeness and Presence: A History of the Image Before the Era of Art* (Chicago: University of Chicago Press, 1994), 303.

Cross Reliquary at Trier (4.12), the latter of which was a modified version of the *Limburger True Cross Reliquary*.[189] The reliquary at Trier borrowed the scale and central placement of the Limburger true cross relic as well as its checkerboard setting of various small panels containing more secondary relics. However, when comparing the *Cross Reliquary at Trier* with the *Limburger True Cross Reliquary* regarding their interest in visuality and glass, it is important to note that in the Byzantine example, the smaller, secondary relics are accessed by opening the doors while the reliquary at Trier displays the relics to the viewer behind pieces of transparent crystal.

Perhaps one reason the vast majority of medieval reliquaries did not more closely follow the Byzantine example of exposing the relics was the Fourth Lateran Council's 1215 mandate that relics be contained within a reliquary. Glass and crystal were the ideal media to both accommodate the congregation's desire to see the relics and adhere to the church's requirements to contain them.[190] The desire to make visual contact with sacred objects in the increasing interest in the Elevation of the Host, which was considered a type of relic. Though the Elevation was not documented prior to the late twelfth century, by the 1230s, the desire to view the holy Eucharist had grown to the point that some church leaders worried that the congregation was no longer interested in receiving the Host but content to solely view it.[191] In fact, many faithful

[189] Klein, "Eastern Objects and Western Desires," 299. Ibid., 296 notes, "the arrival of Byzantine relics in the West is only rarely attested during the eleventh century."

[190] For a similar suggestion, see Angenendt, "Relics and Their Veneration," 26.

[191] Roland Recht, *Believing and Seeing: The Art of Gothic Cathedrals* (Chicago: University of Chicago Press, 2008), 70-71; Vincent Lorne Kennedy, "The Moment of Consecration and the Elevation of the Host," *Mediaeval Studies* 6 (1944): 121-150; Miri Rubin, *Corpus Christi: The Eucharist in Late Medieval Culture* (Cambridge: Cambridge University Press, 1991), 55.

Christians had made viewing the Eucharist a priority, visiting several churches in a day to see as many Elevations as possible.[192]

Arguing in favor of the benefits of viewing the Eucharist was the Franciscan Alexander of Hales. He reasoned that because the Host's virtuous benefits are spiritual and not material, to receive them with one's sense of sight was fitting because the sense of sight was the least tactile or material in nature.[193] Thus, in the case of both monstrances and reliquaries, the glass and crystal windows could have both contained and allowed one to make an important visual connection, which was considered the ideal sensory mode of reception for such an experience.

Symbolism of Glass and Crystal

Because of their similar formal qualities, glass and crystal were often viewed as related, but there was disagreement as to the specific nature of their relationship. In his book on mineralogy, Al-Beruni summarized traditional knowledge and the debate, noting how some held that "crystal is a kind of glass which is found in glass mines in the form of a congealed body" while others "have written in their books that the crystal is a glass-like mineral, whereas glass is an artificial variety of crystal."[194] Still others were not as concerned with their composition as with the physical properties of the media, maintaining that "crystal in some ways resembles glass but is not made from it… but as regards melting they are distinctly different as, while glass melts, crystal does

[192] Recht, *Seeing and Believing*, 71.

[193] Ibid.

[194] Beruni, *The Book Most Comprehensive in Knowledge on Precious Stones*, 160.

not" while, for his part, Beruni agreed with those who believed that "crystal is congealed water."[195] When describing glass, Beruni continued to suggest the position that gemstones and glass are similar in composition when he noted:

> glass is cast from a well-known stone or from sand to which borax has been added. The substance is heated for several days on fire till it accumulates, clarifies and progressively hardens. I think—although this is not a virtual certainty—there are different gems in the form of grains in the sand. If you look at it carefully, you will find black, reddish, white and transparent crystalline grains in them.

In addition to their ability to simultaneously contain, protect, and make visible their contents, glass and crystal also were also transparent, colorless, and reflected light and colors. Because of their related formal qualities, their functional benefits and symbolic value were similar in nature. Attesting to these similarities were the many glass vessels imitating crystal ones in the Fatimid treasury and sold to the West and the Byzantine court.[196] According to Beruni, crystal was "regarded as noble because of its transparency and clarity, and also because

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[195] This view of Beruni's was inspired by Pliny the Elder, *The Natural History*, trans. D. E. Eichholz, vol. 10 (Cambridge, MA: Harvard University Press, 1962), 181. In *The Book Most Comprehensive in Knowledge on Precious Stones*, 163-164, Beruni writes,

> A person who saw crystal-cutters in Basrah says that they find that crystal pieces have grass, wood, gravel, earth and air-bubbles in them. All this testifies to the fact that the crystal in its pristine state was a liquid in motion. This should not come as a surprise as we find things in certain places that have petrified, and when a plant or animal can become converted into stone, it is not strange for earth or water to be petrified, and if people did not see these occurrences often, they could not have become known to the commonalty of mankind.

[196] Shalem, *Islam Christianized,* 57; Kurt Erdmann, "Die fatimidischen Bergkristallkannen," *Wandlungen christlicher Kunst im Mittelalter* (Baden Baden, Germany: Verlag für Kunst und Wissenschaft, 1953), 189-205; Prudence Oliver, "Islamic Relief Cut Glass: A Suggested Chronology," *Journal of Glass Studies* 3 (1961): 9-29.

it is like the essential elements of life (i.e., air and water)."[197] The Latin West's views on crystal stemmed from the same classical roots as Beruni's view that crystal was petrified water and were made stronger by support from a biblical passage. In the Book of Revelation 22:1 it is said, "And he showed me a pure river of water of life, clear as crystal, proceeding out of the throne of God and of the Lamb."

Another analogy shared by both the medieval Muslims and Christians was the paradoxical manner in which light traveled through transparent media. Beruni recorded the words of an anonymous poet who said, "The ray of the sun has been imprisoned in the cup as wine, and so delightful is it that this illusion appears."[198] In the Latin West, a similar analogy developed wherein the Madonna's virgin birth of Christ was related to light passing through glass without breaking it.[199] Many scholars have associated this concept with St. Bernard, but, as Yrjö Hirn describes, the notion had been around since at least the ninth century.[200]

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[197] Beruni, *The Book Most Comprehensive in Knowledge on Precious Stones*, 158. At ibid., 157 Beruni goes into more detail noting,

> The beryl stone which is called *mahā* and *mihā* is said to have its origin in *mā'* (lustre, water). Because of its limpidity and resemblance to the transparency of water, it began to be called *mahā.* The word, *mā'* is said to have its origin in *mawh*, as its double collective nouns are *miyah* and *amwāh: mawhatu al-shay',* is also derived from the same usage, and is spoken of in connexion with a thing which is endowed with a lustre which it previously did not have. This word is also employed when something is inundated with water or made brilliant or sharp."

[198] Ibid., 157.

[199] For more on this analogy, see Elizabeth Carson Pastan, "Glazing Medieval Buildings," in *A Companion to Medieval Art*, ed. Conrad Rudolph (Oxford: Blackwell Publishing, 2006), 445 and Yrjö Hirn, *The Sacred Shrine: A Study of the Poetry and Art of the Catholic Church* (Boston: Beacon Press, 1957), 343-345.

[200] Millard Meiss, "Light as Form and Symbol in Some Fifteenth-Century Paintings," *Art Bulletin* 27 no. 3 (Sept., 1945), 176 quotes St. Bernard as follows, "Just as the brilliance of the

In addition to the important spiritual analogies, there were also potentially significant optical ones. While the ancient Greeks had laid the groundwork for most of the Latin West's optics, the medieval Europeans did not get their information straight from the classical authors; rather, Muslim translators and scientists played a crucial part. Islamic efforts to collect and translate ancient learning inspired many original contributions and the impact of these Arabic translations, commentaries, and original optical treatises cannot be overstated.[201] The works of Avicenna, Averroes, Hunain, and, above all, Alhazen began to filter into the Latin West in the late eleventh century, with their numbers and influence peaking in the thirteenth century.[202] Thus, like many of the glass and crystal objects, the West's understanding of the visual process and the eye's anatomy was also coming from Arabic sources.

With the influx of these new optical treatises, the way the West conceptualized the process of vision began to change. From the fourth century through the end of the thirteenth century, its theory of vision had been dominated by the ideas of Plato, but by the beginning of the fourteenth century, Aristotle's visual theory had superseded that of Plato and become the dominant model.[203] Aristotle's impact will be discussed in greater detail in following chapters.

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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." For more on the earliest uses of this concept, see Hirn, *The Sacred Shrine*, 343-344.

[201] For more on Alhazen's importance see David C. Lindberg, *Theories of Vision From Al-Kindi to Kepler* (Chicago: University of Chicago Press, 1976), 85-86. For the reception of Alhazen by Albert Magnus see ibid., 104-107; for Roger Bacon's debt to Alhazen, ibid., 109.

[202] Arthur Hyman and James Walsh, eds., *Philosophy in the Middle Ages* (Indianapolis, IN: Hackett Publishing Company, 1973), 452. Up until about 1240, the main commentator on Aristotle was Avicenna; from then on, it was Averroes.

For now, however, it is important to note that Eastern optical theory was largely entering the West during the twelfth and thirteenth centuries—the same moment when objects and knowledge of glass and crystal were entering the West's consciousness on a large scale.

Here, it is helpful to consider more closely the connections between glass and the sense of sight. The rationale for linking glass and optics begins at the etymological level: the ancient term for glass, *vitrum,* derived from the verb *videre*, meaning "to see."[204] In addition, there were other compelling reasons why an early modern viewer might have associated the properties of glass and crystal with the sense of sight: namely, the fact that the eye was composed of glass-like and crystal-like components.

Ḥunayn ibn Isḥāq al-'Ibādī (Hunain) shaped the West's understanding of the eye's anatomy and the visual process.[205] Though he derived much of his treatise from Galen, he made his own important distinctions and contributions. During the medieval period, the Latin West did not have access to Galen and therefore much of Western optical knowledge came from Hunain's *Ten Treatises on the Eye,* which was translated into Latin by Constantinus Africanus around 1100.[206]

For Hunain, vision occurred in the eye's lens (fig. 4.13).[207] He describes the lens of the eye as a crystalline humor, which is whitish or uncolored, transparent, luminous, and round with

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[203] Lindberg, *Theories of Vision*, 116; Maginnis, *The World of the Early Sienese Painter*, 349-350.

[204] Vincent Ilardi, *Renaissance Vision from Spectacles to Telescopes* (Philadelphia: American Philosophical Society, 2007), 38.

[205] Though he was not Muslim he wrote in Arabic and thus would have been associated with the region of the Holy Land.

[206] Lindberg, *Theories of Vision*, 41.

a flattened face.[208] The lens's transparency allowed it to quickly receive the colors of perceived objects, its round shape prevented breaking or chipping, and its flatness provided a large surface on which to receive visual stimuli.[209] In his detailed analysis of Hunain's text, Bruce Stansfield Eastwood notes, "The qualities of the lens are those which match the materials it works with in vision—purity of color (white), pure fire or light (luminous), and the clarity of pure air (transparent)."[210]

As it was the seat of vision, the lens occupied the central position in the eye so that it could be served by the other elements. The most important supportive membrane, which provided the lens with the necessary nutrients to function, was the one located directly behind it, the vitreous humor, which Hunain described as glass-like. This vitreous tunic served the crystalline humor by mediating between it and the blood vessels of the retina, a crucial function, because, as Hunain explained:

> Every one of the members of the human body requires nourishment, and this is without doubt because there is a continual loss of its substance going on through dissolution by reason of the influence of the natural warmth from within and the warmth of the air from without. For this reason it requires a substance to replace that which has been dissolved. But nothing can replace the dissolved substance except that which resembles it, *i.e.* something similar in nature to the member in question. The nutrition is effected in this wise, *viz.* that the member receives an addition of substance resembling its own nature. This accretion, however, can

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[207] Ibid., 34.

[208] Ibid., 34-41.

[209] Ḥunayn ibn Isḥāq al-'Ibādī, *The Book of the Ten Treatises on the Eye*, trans. Max Meyerhof (Cairo: Government Press, 1928), 3.

[210] Bruce Stansfield Eastwood, "The Elements of Vision: The Micro-Cosmology of Galenic Visual Theory According to Hunayn Ibn Ishaq," *Transactions of the American Philosophical Society* 72 no. 5 (1982): 4.

> only resemble the nature of the member if the latter transmutes it according to its own nature. A substance is most quickly transmuted into the thing which resembles its own nature most closely. Since the lens without doubt requires nourishment and since, as we mentioned already, this humour is white, transparent and luminous, it is impossible for it to receive its nutrition direct from the blood. It requires an intermediary between its nature and that of the blood; and such is the glass-like humour [the vitreous], as it is nearer to the white colour and transparency than the blood. Therefore the vitreous is adjacent to the lens without any partition, and it [the lens] is half submerged in it [the vitreous].[211]

Thus, the blood vessels in the retina were too dissimilar from the crystalline lens for the two to exchange nourishment. Because it was similar to crystal but slightly different, the glass-like humor could relate to both the crystal lens and the bodily fluids in the retina. Although it is not clear how glass could relate to blood, this is still a useful insight to apply to an analysis of glass reliquaries because the way in which glass-like components functioned in the eye could be related to their function within devotional art.

An important theme in Hunain's description of the lens, and the rest of his treatise, is the concept that like affects like. If one extends this notion and applies it to the perceived objects, it becomes evident that glass vessels containing relics could have created a powerful visual encounter for one familiar with these concepts. Firstly, the crystal or glass flask could have easily communicated its visual information to the eye because it was similar in nature to the eye's structure. Secondly, just as the glass-like component in the eye transmitted nutrients from the body's blood to the lens, the glass reliquaries transmitted a visual image of the relic, the saintly blood and spiritual nourishment, to the seat of vision.[212]

[211] Hunain, *The Book of the Ten Treatises on the Eye*, 6.

Thus, although the natures of glass and crystal were very similar and they could have both related to crucial aspects of the eye's anatomy, important differences existed, both in terms of the optical connections and in terms of their media. Crystal was more rare than glass; according to Beruni, glass "is softer than crystal and, being more profusely available, is rated lower."[213] However, though traditionally seen as more precious than glass, the medium of crystal had certain disadvantages. Because it was more rare, when one broke or otherwise destroyed a crystal object, the loss was severe. In addition to his discussion of the properties of crystal, Beruni included several famous stories involving crystal objects. Many of these stories he recounted describe the sadness felt by an object's owner upon the destruction of prized crystal objects.[214] Furthermore, as crystal was a naturally produced material, one could not control the appearances of blemishes; the best one could do was work around them. As Beruni explained, "If a hole, knot, or cloudiness tells upon its transparency, it is masked by some etched design or inscription, requiring considerable expertise."[215] Glass, however, could be recast if there were imperfections and, because it was lower in value, when glass objects were broken, they could be

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[212] This reading may further strengthen the analysis of Nicola Pisano's Arca in chapter 3. In this case, the gilded glass could have mediated between the saint's blood and the blood fueling the viewer's sense organ.

[213] Beruni, *The Book Most Comprehensive in Knowledge on Precious Stones,* 192.

[214] Ibid., 162.

> Alexander saved himself from the shock which Ayārūn had sustained. He was presented a set of beautiful crystal vessels. He expressed his appreciation for them and then ordered that they should be dashed to pieces. When he was asked why he gave this command, he said 'I knew that each of them would break at the hands of the servants and everytime I would be furious. I, therefore, chose to sustain grief only once and saved myself from the sorrow which I would have felt on each occasion and the servants from the whip of my fury.'

[215] Ibid., 159.

replaced at a lower cost or, even better, the broken pieces of glass could be melted and reused. Thus, it becomes apparent, through a consideration of the differences between glass and crystal, that although it was traditionally viewed as less valuable, glass had certain advantages when it came to enhancing one's visual experience of devotional art.

In conclusion, during the thirteenth century, the Latin West was simultaneously absorbing Islamic optical theory and glassmaking resources as well as actual glass and crystal vessels from the Levant, many of the most revered functioning as reliquaries. It is for reasons such as these that one should consider Eastern glass vessels as more than mere spolia or exotica; instead, the Latin West's understanding of Eastern glass objects was fundamentally shaped by the spiritual power of the relics, the optical theory of the East, and the act of viewing inherent in each. As the next chapter will demonstrate, in the following century, central Italian artists seem to have maximized the potential of these various elements in their attempts to venerate relics in the most powerful way possible and, in so doing, used transparent glass to create something unique and characteristic of their culture.

CHAPTER FIVE

TRANSPARENT GLASS

The previous chapter, "Eastern Glass," emphasized the important impact of Levantine glass and optical theory on the Latin West and described some of the ways early modern Europe assimilated new technologies and ideas. The present chapter examines how the West assimilated these imports into their own cultural context and produced something characteristic of the Trecento. It investigates what many consider to be the burgeoning Renaissance view—specifically, the growing interest in Aristotle's notion that sensory experiences are valid forms of information and the resultant desire to understand the natural world and capture realistic representations of it—in relation to the rising availability of transparent glass and products made from it such as mirrors, lenses, and eyeglasses, and to new optical theory.

In so doing, it builds from Alan Macfarlane's theory that glass functioned as a "thinking tool," that is, that "the art of the glass-maker, in turn fed by the new knowledge in geometry and optics, flourished and was increasingly applied to uses of glass explicitly designed to improve the human eye and what it saw."[216] The rise of glass-making capabilities in late-thirteenth-century Europe led to an increasing number of high-quality mirrors, lenses, and eyeglasses, instruments that allowed one to contemplate one's view of the world and the properties of light in new ways. Glass lenses extended one's eyesight into old age through magnifying glasses or eyeglasses while mirrors made of glass allowed one to more accurately study one's reflection than one could have done with metal mirrors. Glass windows protected one from the natural elements but allowed for a constant vista into the surrounding land and more light to flood into the interior.[217]

As mentioned in the last chapter, many thirteenth- and fourteenth-century reliquaries and monstrances used glass and crystal to simultaneously contain and reveal holy relics and the Eucharist. This chapter explores in more detail Trecento reliquaries using specially fashioned round glass windows. Examples of this type include Naddo Ceccarelli's *Reliquary Tabernacle*

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[216] For Macfarlane's comment on glass as a "thinking tool," see Alan Macfarlane, *Glass: A World History* (Chicago: University of Chicago Press, 2002), 14. For additional commentary on this idea, see ibid., 40, 51-59.

[217] Ibid., 43. As Macfarlane p. 43-45 notes, "It could also be argued that windows altered thought at a deeper level. The question here is the way in which glass, whether in a mirror, window, or through a lens, tends to concentrate and frame thought by bounding vision, and at the same time leads to abstraction and attention to the details of nature. It seems likely that the glass window altered the relations between humans and their world in ways which it is now difficult to recover. It may have encouraged the contemplation of external nature from within the house, an appreciation of nature for its own sake, seen through a window." However, Macfarlane, 47-48, also acknowledges that "obviously glass, on its own, is not enough. Without the burst of curiosity and new knowledge from ancient Asian civilizations, all the glass in the world would probably have had little influence on thought. It is the combination of curiosity and tools that is important…. Yet glass, it seems to us, is a *sine qua non* of the development of the experimental method we call science."

with Virgin and Child (fig. 5.1); Lippo Vanni's *Reliquary with Virgin and Child with Saints* (fig. 5.2); Lippo Vanni's *Reliquary Triptych* in the Vatican Collection (fig. 5.3); the Master of the Dijon Tabernacle's *Reliquary with Madonna and Child and Franciscan Friar and Donor,* which is now divided between the Berenson Collection and a private collection in Rome (fig.5.4); Francesco di Vannuccio's *Reliquary Tabernacle* formerly of the A. S. Drey Collection (fig. 5.5); and Francesco di Vannuccio's *Reliquary with Madonna and Child and Saints John the Baptist, Paulinus of Nola and Louis of Toulouse* in the Museo Civico of Montepulciano (fig. 5.6).[218] In addition to these, examples dating to slightly after mid-century include Bartolo di Fredi's *Reliquary Triptych with the Annunciation, St. Ansanus, the Adoration of the Magi, and the Crucifixion* in a private collection in London from around 1370 (fig. 5.7), and two works by Simone di Filippo, also known as Simone dei Crocifissi: *Reliquary Triptych with Madonna and Child* in the Louvre (fig. 5.8) and the *New Testament and Apocryphal Scenes with Saints* in the Walters Art Museum (fig. 5.9).

A brief survey of these reliquary panels reveals that their glass windows greatly differed from the Levantine crystal reliquaries and the glass reliquaries imitating crystal discussed in the last chapter. In the earlier examples, the crystal was usually thick and carved with faceted designs. In the Trecento reliquaries with glass windows, on the other hand, the glass was relatively thin and featured a smooth texture. Unlike the crystal vessels, which enhanced the light-catching qualities of the material, the type of glass used for the relic windows emphasized the clear properties of the medium. The very different treatment of the glass used in reliquaries

[218] See Eliot W. Rowlands, "Sienese Painted Reliquaries of the Trecento: Their Format and Meaning," *Konsthistorisk Tidskrift* 48 (1979): 122-138 for a discussion of the type of reliquary under discussion in this chapter. This study will both expand the examples featuring this format and focus more on an analysis of transparent glass roundels than does Rowlands.

from that of crystal is possibly explained by the fact that there were statutes prohibiting glassmakers from imitating crystal works.[219] However, it is also possible that, due to its increasing manufacture, glass had become distinguishable from crystal and thus resonated with the public in a different way than its more precious and naturally occurring counterpart. Further distancing these Trecento reliquaries from earlier reliquaries was the fact that they combined these glass windows with painted naturalistic imagery. Many of the reliquaries seem to combine a small devotional panel painting with relics in a way not previously seen.

This chapter analyzes Trecento reliquaries with glass roundels, paying particular attention to the cultural significance of transparent glass and the way it related to the relics and other decoration. To conduct such a study, it is first necessary to establish the complex historical context where religion, science, and art intersected.[220] Therefore, before analyzing the reliquaries, this study examines the intersections between optics and religion, between optics and glass, and between art, artists, and glass optical devices in order to illustrate the complex dialogue occurring at this time. By taking such uses of glass into consideration when analyzing the many devotional artworks that incorporated transparent glass, a more complete understanding of Trecento visuality, and thus art, is possible.

In order to examine these reliquaries in their context, this chapter draws from scholarly literature on Trecento reliquary tabernacles by scholars such as C. Griffith Mann and Eliot W. Rowlands to situate these devotional works more firmly within the growing optical knowledge

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[219] Vincent Ilardi, *Renaissance Vision from Spectacles to Telescopes* (Philadelphia, PA: American Philosophical Society, 2007), 8.

[220] While mirrors could be considered reflective glass, they are considered in this chapter because it was the transparent glass that made them effective reflective devices and therefore they are part of this larger cultural shift made possible by transparent glass.

and technological capabilities of Central and Northern Italy.[221] Such an approach allows one to connect and analyze similar trends simultaneously running through the science, art, and religion of the time. Combining formal analysis of the reliquaries with scholarship on relic worship and research on the history of science establishes a more comprehensive understanding of this period.[222] Diverging from previous studies, the present investigation simultaneously analyzes actual artistic glass decorating reliquaries, depictions of glass in art and literature, and the symbolic meanings and spiritual implications of glass, light, and vision.

Optics and Religion

Such an interdisciplinary approach to this subject is needed because the functional uses and symbolic associations of glass were not confined to the domain of the natural scientist. In fact, oftentimes the churchmen and scientists were one and the same. Pope John XXI (r.1276-1277), the so-called ophthalmologist-pope, wrote a textbook on caring for the eyes, *Liber de oculo*, which drew from ancient and Arabic knowledge and was consulted heavily at Salerno's medical school.[223] The preacher, Fra Alexander della Spina, observed some of the earliest eyeglasses and understanding of the nature of sight in order to harness it for sacred ends. As mentioned in the last chapter, thinkers such as the Franciscan Alexander of Hales (ca.1170/85-1245) argued that

[221] Rowlands, "Sienese Painted Reliquaries," 122-138 and C. Griffith Mann, "Relics, Reliquaries, and the Limitations of Trecento Painting: Naddo Ceccarelli's Reliquary Tabernacle in the Walters Art Museum," *Word and Image* 22 no. 3 (July-Sept. 2006): 251-259.

[222] Cynthia Hahn, "What do Reliquaries do for Relics?," *Numen* 57 (2010): 284-316; Herbert L. Kessler, "Speculum," *Speculum* 86 (2011): 1-41; David C. Lindberg, *Theories of Vision From Al-Kindi to Kepler* (Chicago: University of Chicago Press, 1976).

[223] Ilardi, *Renaissance Spectacles*, 27-28.

one's sense of sight was vital for successfully receiving the benefits of the Host. Because the Eucharist bestowed spiritual, immaterial benefits, the sense of sight was the most appropriate sense organ with which to receive them because it was the most immaterial of the five senses.[224]

For one of Alexander of Hales's most famous contemporaries, Francis of Assisi (ca. 1181/82-1226), the Eucharist's importance stemmed from the fact that it represented a tangible, visible fusion of the earthly world and the heavenly one.[225] In his *Letter to the Entire Order* Francis wrote, "Therefore, kissing your feet and with all that love of which I am capable, I implore all of you brothers to show all possible reverence and honour to the Most Holy Body and Blood of our Lord Jesus Christ in Whom that which is in heaven and earth has been brought to peace and reconciled to Almighty God."[226] This quote indicates that Francis was keenly aware of the separation of the two realms but found value in both through their relationship to one another. Because Francis could view the physical world as a reflection of God's divine grace, he could value it, study it, and reflect upon it. Such an outlook was opposed to the view held by groups such as the Cathars, who understood the natural world as a potentially harmful distraction from the heavenly ideal.[227]

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[224] Roland Recht, *Believing and Seeing: The Art of Gothic Cathedrals* (Chicago: University of Chicago Press, 2008), 70-71.

[225] Timothy J. Johnson, "Francis and Creation," in *The Cambridge Companion to Francis of Assisi,* ed. Michael J. P. Robson (Cambridge: Cambridge University Press, 2012), 144.

[226] St. Francis of Assisi, *A Letter to the Entire Order,* in *Francis and Clare: The Complete Works*, eds. Regis J. Armstrong and Ignatius Brady, The Classics of Western Spirituality (New York: Paulist Press, 1982), 56.

[227] As Johnson, "Francis and Creation," 144-145 explains, Francis was "free to embrace the reality of the material world and enter into a relationship with creation on its own terms and praise the Creator."

Francis's conviction that the natural world was closely related to the divine world underscored his celebration of creation, humanity, and animals that eventually led to his role as the patron saint of animals and ecology within the modern Catholic Church. Much of the scholarship exploring this Franciscan ideal has focused on the famous hymn originally written in the local Umbrian dialect, the *Canticle of the Creatures*.[228] In this prayer, Francis positioned the animals and various aspects of the natural world, like the sun and moon, as equal to human beings and implored his followers to consider them one's brothers and sisters. Verse nine of the hymn reads, "Praised be You, my Lord, through our Sister Mother Earth, who sustains and governs us, and who produces varied fruits with colored flowers and herbs."[229] Francis not only believed in these words, but he also put them into action. Thomas of Celano recorded that "he used to call all creatures by the name of 'brother' and 'sister' in a wonderful way, unknown to others; he would discern the secret of the hearts of creatures, like someone who has already passed into the freedom of the glory of the children of God."[230] Also attesting to this way of life is Francis's famous sermon to the birds, where, as Celano also recounts,

> the most blessed father Francis was journeying through the valley of Spoleto, and came to a spot near Bevagna where a very great number of birds of different sorts were gathered together…. When he saw them, being a man of the most fervent temper and also very tender and affectionate toward all the lower and irrational creatures, Francis the most blessed servant of God left his companions in the way and ran eagerly toward the birds. When he was come close to them and saw that they were awaiting him, he gave them his accustomed greeting. But, not a little surprised that

[228] Eloi Leclercq, *The Canticle of Creatures: Symbols of Union,* trans. Matthew J. O'Connell (Chicago: Franciscan Herald Press, 1978), 4; Fiorenza Bajetto, "Un trentennio di studi (1941-1973) sul Cantico di Frate Sole. Bibliografia ragionata," *L'Italia francescana* 49 (1974): 5-62.

[229] St. Francis of Assisi, *The Canticle of Brother Sun,* in Armstrong and Brady, *Francis and Clare: The Complete Works*, 39.

[230] Cited in Johnson, "Francis and Creation," 146.

> the birds did not fly away (as they are wont to do) he was filled with exceeding joy and humbly begged them to hear the word of God: and, after saying many things to them he added: 'My brother birds, much ought ye to praise your Creator, and ever to love Him who was given you feathers for clothing, wings for flight, and all that ye had need of. God has made you noble among His creatures, for He has given you a habitation in the purity of the air, and, whereas ye neither sow nor reap, He Himself doth still protect and govern you without any care of your own.' On this (as he himself and the brethren who had been with used to say) those little birds rejoicing in wondrous fashion, after their nature, began to stretch out their necks, to spread their wings, to open their beaks and to gaze on him. And then he went to and fro amidst them, touching their heads and bodies with his tunic. At length he blessed them, and, having made the sign of the cross, gave them leave to fly away to another place.[231]

By placing spiritual value on the created world, Francis was part of a shifting attitude towards the observable world.[232] His high regard for the physical world opened his order up to the study of natural science, and particularly optics.[233] Supporting this claim is the fact that many of the leading scientific thinkers were affiliated with the Franciscan order.[234] Roger Bacon

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[231] Thomas of Celano, *The First Life of Saint Francis,* in *The Lives of St. Francis of Assisi*, trans. A. G. Ferrers Howell (London: Methuen & Co., 1908), 57-58.

[232] For the distrust of the senses in the earlier medieval period see Richard G. Newhauser, "Peter of Limoges, Optics, and the Science of the Senses," *Sense and Society* 5 no. 1 (2010): 29. For more on the shift to a more visually inclined culture, see Alfred W. Crosby, *The Measure of Reality: Quantification and Western Society, 1250-1600* (Cambridge: Cambridge University Press, 1997), 3-19.

[233] The question of a specific brand of "Franciscan optics" is discussed in Ilardi, *Renaissance Vision*, 27.

[234] Leading scientists in other fields were also associated with the church because, as has rightly been noted by Macfarlane, *Glass,* 45 and Ilardi, *Renaissance Vision*, 27, one of the main reasons the churchmen made such great advancements in science was that they had the access to educational resources and the time and opportunity to study. Lindberg, *Theories of Vision*, 107 urges caution in making superficial connections. Despite these explanations and cautions, however, it is still important to note the intersections between religion, science, and art and the fact that Franciscans made notable achievements in each of these fields. Moreover, as will be

(ca. 1120-ca. 1292), John Pecham (ca. 1225–1292), John Duns Scotus (ca. 1266-ca. 1308), Bartholomeus Anglicus (b. before 1203-1272), Robert Grosseteste (ca. 1170-1253), and William of Ockham (ca. 1287–1347), all belonged to or maintained associations with the Franciscan Order.[235] Also, St. Bonaventure, the "second Francis," wrote extensively about light, the counterpart to sight.[236] In addition to these important theorists, as mentioned in chapter 3, the Franciscan decoration at Assisi included reflective mirrors imitating stars and, as will be discussed in further detail below and in the next chapter, many other Franciscan commissions used glass and mirrors in innovative ways (depictions of eyeglasses, reliquaries with windows and mirrors) and depicted naturalistic imagery that may be seen to reflect keen interest in and observation of the natural world.

During the thirteenth century, the most influential optical theorist was Roger Bacon. Best known for his *Opus maius, De multiplicatione speciarum,* and *De speculis comburentibus,* Bacon was dedicated to close observation of the natural world and realized that an understanding of vision was instrumental to this goal.[237] Bacon's work developed in the Franciscan milieu at

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discussed later in this chapter, many Franciscan paintings depict optical devices. They also used glass in interesting ways in many of their Trecento reliquaries, as will be discussed in chapter 6.

[235] Lindberg, *Theories of Vision*, 107. Bacon and Pecham both joined the Franciscan order around 1250 in Oxford; see David C. Lindberg, "Lines of Influence in Thirteenth-Century Optics: Bacon, Witelo, and Pecham," *Speculum* 46 no. 1 (Jan. 1971): 67. For Duns Scotus, see Katherine H. Tachau, *Vision and Certitude in the Age of Ockham: Optics, Epistemology and the Foundations of Semantics, 1250-1345* (Leiden: E.J. Brill, 1988), 55. For Ockham, see ibid., 113. For Grosseteste's association with the order, see Lindberg, *Theories of Vision*, 107.

[236] For more on Bonaventure's theory of light, see Lucia Miccoli, "Two Thirteenth-Century Theories of Light: Robert Grosseteste and St. Bonaventure," *Semiotica* 136 no. 4 (2001): 69-84.

[237] On Roger Bacon, see John Henry Bridges, *The "Opus majus" of Roger Bacon* (Cambridge: Cambridge University Press, 1964); David C. Lindberg, *Roger Bacon's Philosophy of Nature* (Oxford: Oxford University Press, 1983); idem, *Roger Bacon and the Origins of Perspectiva in the Middle Ages* (Oxford: Oxford University Press, 1996).

Oxford and Paris and was supported by Pope Clement IV, evidence that his ideas were not confined to the world of the scientist. As Timothy Johnson describes it, "To care for creation and embark on the journey into God requires close attention to the natural world…. [Bacon gave] voice to the Franciscan fascination with the myriad reflections of divine agency and purpose in the materiality of the earth."[238] Thus, because the natural world could help one get closer to God, it was worth investigating it and one's vision of it.

To achieve such a task, Bacon pioneered the first Western visual theory to fully integrate and synthesize all previous optical knowledge, incorporating both ancient optical treatises, such as those by Aristotle, Euclid, and Ptolemy, as well as Arabic sources by Avicenna, Averroes, al-Kindi, and, most importantly, Alhazen.[239] Previous optical treatises were dominated by Plato's ideas and the notion of extramission vision. With Bacon and Albertus Magnus, the West became more ensconced in the intromission position.[240] It was through studying Alhazen that Bacon formulated his mode of intromission, based on the fact that all objects issue species or rays in all directions in the form of a visual pyramid with its base at the perceived object and its apex at the observer's eye, with the stronger, perpendicular rays overpowering the weaker oblique ones to create a coherent view of the object.[241] As Bacon explained,

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[238] Johnson, "Francis and Creation," 153.

[239] Lindberg, *Theories of Vision*, 109 and 1I2. For the most influential theorists on the Western view preceding Bacon—that is (in chronological order), Seneca, Pliny the Elder, Chalcidius's translation of Plato's *Timaeus*, Augustine, William of Conches, Robert Grosseteste, and Albertus Magnus—see ibid., 87-107. For more on the most significant optical treatises of the fourteenth century, see ibid., 122-146. Albertus achieved a similar feat just before Bacon but did not fully integrate Alhazen.

[240] Lindberg, *Theories of Vision*, 116 for comment on Aristotle superseding Plato. For Albertus's contribution and his attempt to synthesize all previous knowledge on optics, except, that is, for only limited exposure to Alhazen, see ibid., 104-105.

> Although to every point of the eye and cornea comes the apex of one pyramid [originating] from the whole object, and the species of all parts [of the object] are there mixed, nevertheless to one point of the eye or cornea and the aperture of the uvea [i.e., the pupil] comes a species perpendicularly from only one point of the visible object, although to the same point come an infinity of species inclined at unequal angles [i.e., obliquely]. Therefore since the body of the eye is denser than air, it is necessary, according to the laws of refraction determined above, for all oblique lines to be refracted at the surface of the cornea. And since oblique incidence weakens the species, and similarly refraction, and perpendicular incidence is strong, therefore the perpendicular species conceals the oblique ones, as a bright and strong light conceals many weak lights.[242]

For perception to occur, Bacon explained that these rays or species from the perceived object are cast onto the anterior glacial humor of the eye.[243]

> The principal requirement is simply that sight should perceive the object distinctly and sufficiently and with certitude, and this can occur through a pyramid in which there are as many lines as there are parts or points in the visible body, along which individual species come from the individual parts [of the object] until they reach the anterior glacial humor in which the visual power resides. And those lines are terminated on individual parts of the glacial humor, so that the species of the parts of the object are arranged on the surface of the sentient organ exactly as are the parts of the visible object [from which they originated].[244]

In addition to the visual model of Alhazen, Bacon also adopted many of his requirements for the visual process to occur (i.e., light, size of the object, transparency of the intervening medium, the

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[241] Ibid., 109.

[242] Quoted in ibid., 109.

[243] For Bacon, a species was the "first natural effect of any agent" or, as Lindberg summarizes, "this species is not a material emanation or effluence; rather, an object produces its likeness or species in the adjacent transparent medium, which in turn produces a further likeness in the next part of the medium, and so forth." For more on this, see, Lindberg, *Theories of Vision*, 113-115.

[244] Cited ibid., 109-110.

perceived object's density, the separation between the object and eye, and the time and health of the eye) as well as visual properties (i.e., light, shape, etc.).[245]

Bacon's work was very influential; one of the most well-known texts to draw from Bacon was Peter of Limoges's *Moral Treatise on the Eye*.[246] This manual for preachers, written around 1280 in Paris, blended the perspectivist optics of Bacon with moral implications for the sensory experience of sight. Peter's work spread the optical theories of the scientist-churchmen to the wider public through their use as symbols for divine understanding. However, though closely based on Bacon and Alhazen, Peter diverged in important ways: he emphasized greater participation and put strong importance on the intention of the viewer. This approach gave his visual theory a more active viewer; the onus was on the faithful to generate the appropriate piety to see, and therefore understand, divine truth. It also generated a greater sense of extramission vision and revived the visual theory of Plato.[247] Thus, in a time still dominated by the church's authority, when one brought scientific theories to the pulpit to share with the congregation, certain modifications were made to optical theory in order to accommodate the spiritual position of the church, indicating that a tension was still present and there was no one clear, dominant visual theory.

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[245] Ibid., 111-112.

[246] For general summary and analysis of this treatise, see Richard G. Newhauser, "Peter of Limoges, Optics, and the Science of the Senses," *Sense & Society* 5 no. 1 (2010): 28-44; Peter of Limoges, *The Moral Treatise on the Eye*, trans. Richard Newhauser, Mediaeval Sources in Translation 51 (Toronto: Pontifical Institute of Mediaeval Studies, 2012); Dallas G. Denery, "Peter of Limoges, Perpectivist Optics and the Displacement of Vision," in his *Seeing and Being Seen in the Later Medieval World: Optics, Theology and Religious Life* (Cambridge: Cambridge University Press, 2005), 75-116. Newhauser, "Peter of Limoges," 31 cites evidence attesting to the widespread nature of this treatise: 220 manuscripts survive and there is evidence of 44 other copies no longer intact.

[247] Newhauser, "Peter of Limoges," 36.

Optics and Glass

The close connection between the medium of glass and issues related to vision may seem logical, or even obvious, at first. The link is especially evident when the concepts are translated into their ancient terms, *vitrum* (glass) and *videre* (to see).[248] However, for the purposes of this study, it is important to carefully consider the various facets of this relationship, especially through the eyes of the early modern viewer.

Glass objects were crucial to the theoretical developments of Roger Bacon and to optical scientists both before and after him. It was through studying the effects visible in mirrors and lenses that early-modern thinkers could directly observe the properties of light and sight.[249] For example, in "Part Three of Perspective" of *Opus majus*, Bacon discussed vision in reflected and refracted lines and demonstrated his theories with mirrors.[250] Through observing the effects seen in mirrors, he was able to explain the various visual effects produced in different types of mirrors.[251] In one such example, Bacon described that when "the eye is at the center of a concave mirror, it is the only thing visible to itself; for no form is reflected to the center except

[248] Ilardi, *Renaissance Vision*, 38-39.

[249] Macfarlane, *Glass*, 42 notes, "He looked at various curved surfaces and the principles of refraction and reflection from these surfaces, using concave and convex mirrors. He looked at clear mirror images to see how the image is reflected in the mirror. Mirrors, prisms and lenses allowed the new mathematics and geometry to develop."

[250] Robert Belle Burke, *The Opus Majus of Roger Bacon*, vol. 2 (Whitefish, MT: Kessinger Publishing, 2002), 546-557.

[251] Ibid., 553-557.

that which comes from the center. The perpendicular, in fact, returns upon itself."[252] This experiment demonstrated that an appropriate distance and the proper positioning of eye and object were necessary for successful vision.

When writing his *Moral Treatise on the Eye*, Peter of Limoges described the latest scientific theories and then used them to explain spiritual issues. For instance, when discussing the same example described by Bacon, Peter noted that a

> proportionate amount of distance is required for sight. For if a visible object is placed directly on the eye, or if it is very distant from the eye, it will not be seen…. In similar fashion, if a scholar is very distant from anything to be learned because of hatred, or if he undertakes to learn it with an excessive amount of love, he does not see it nor does he judge it correctly. For love and hate pervert judgment.[253]

This comparison illustrates that glass objects could be used to explain scientific as well as spiritual principles and therefore the medium of glass could be associated with both physical sight and spiritual insight.

Other intersections between glass and optics are found within the very structure of the eye. As described in the last chapter and discussed by Vincent Ilardi and Marco Beretta, the vocabulary used to describe and define the eye and its components relied heavily on glass, crystal, and the properties of lenses.[254] A theoretical substance with the qualities of transparent

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[252] Ibid., 555.

[253] Cited in Newhauser, "Peter of Limoges," 33. According to Newhauser the original is not paginated and he therefore describes this passage as from the third section of chapter 11.

[254] Ilardi, *Renaissance Vision*, 38 and Marco Beretta, "From the Eye to the Eyeglass: A Pre-History of Spectacles," in his *When Glass Matters: Studies in the History of Science and Art from Graeco-Roman Antiquity to Early Modern Era* (Florence: Leo S. Olschki, 2004), 249-82. The glass humor was not located at the center of the eye and therefore was not the point at which vision actually occurred; according to the medieval view, that role was played by the crystal

glass was also instrumental to the Aristotelian model of vision, which was beginning to supersede Plato's extramission model in large part due to the effort of Albert the Great and Roger Bacon.[255]

In his works, *De anima* and *De sensu*, Albertus discussed and dismissed many of the previous theories of vision, including those put forth by Plato, Euclid, and al-Kindi.[256] Albertus drew from Avicenna and Averroes to defend Aristotle's theory that vision occurs when the object alters the transparent medium between it and the eye and then the eye absorbs the altered medium.[257] Albertus certainly knew that, for Aristotle, the transparent medium between the eye and object was crucial to the visual process. As Aristotle described,

> The evidence for this is clear; for if one puts that which has colour right up to the eye, it will not be visible. Colour moves the transparent medium, *e.g.,* the air, and this, being continuous, acts upon the sense organ. Democritus is mistaken in thinking that if the intervening space were empty, even an ant in the sky would be clearly visible; for this is impossible. For vision occurs when the sensitive faculty is acted upon; as it cannot be acted upon by the actual colour which is seen, there only remains the medium to act on it, so that some medium must exist; in fact, if the intervening space were void, not merely would accurate vision be impossible, but nothing would be seen at all.[258]

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humor. However, despite its secondary nature, the glass humor was instrumental for the visual process to occur.

[255] Lindberg, *Theories of Vision*, 116; 104-105.

[256] Ibid., 104-105.

[257] Ibid., 105 notes, "In place of these discredited theories, [Albert] attempts to establish the Aristotelian doctrine that vision is caused by an alteration (*immutatio*) of the transparent medium by the visible object and the propagation of this alteration to the watery substance of the eye."

[258] Quoted in ibid., 7.

Aristotle defined the transparent medium as something "which is visible, only not absolutely and in itself, but owing to the colour of something else. This character is shared by air, water, and many solid objects; it is not *qua* water or air that water or air is transparent, but because the same nature belongs to these two as to the everlasting upper firmament."[259] It is worth considering that, although in Aristotle's time transparent glass was not widely available and thus not a likely example to cite, by the thirteenth and fourteenth centuries transparent glass not only fit the definition of the medium but was widely available, more so than crystal, and easily manipulated for the decoration of devotional art, unlike water or air.

Thus, when looking across various fields of early modern culture, it becomes apparent that the presence of glass was simultaneously influencing scientific theory, practical experiences, religious constructs, and the production of artworks. Theoretically glass was also intimately involved in the process of sight and the structure of the eye itself. By using mirrors and lenses, natural scientists like Roger Bacon tested their theories and churchmen like Peter of Limoges contextualized this science within Christianity. As will be discussed further below, other men of the cloth, such as Alexander della Spina, blended the world of preacher and craftsman by spreading word of this innovation to the larger public and actually fashioning eyeglasses. Finally, various people, including artists, used mirrors and eyeglasses to view themselves and their surroundings more clearly.

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[259] Quoted in ibid.

Glass Optical Devices

That artists played a complex role within this interrelated web of cultural exchange should not be surprising. As will be discussed in further detail below, through their artworks depicting mirrors and eyeglasses it is apparent that artists such as Giotto and Tommaso da Modena certainly knew of the various symbolic interpretations of these optical devices either on their own or from theological advisors.[260] Furthermore, due to the nature of their work, it is likely that many artists benefitted from lenses or glasses especially when doing fine, detailed work or after working for several decades. It is also possible that glass devices had a more complex impact on art and culture of early modern Italy as in the case of Brunelleschi's perspective demonstration panel with a depiction of the Florentine Baptistery using a mirror, a rich topic best described through Samuel Edgerton's work.[261]

The earliest instance of an optical instrument depicted in a monumental fresco dates to 1305. In the Arena Chapel, Giotto painted a series of grisaille personifications of virtues and vices running along the bottom of the two side walls. The figure of Prudence sits behind a broad desk and holds a measuring compass in one hand and a small, circular mirror in the other (fig.

[260] Ilardi, *Renaissance Vision*, 22 notes that among his many travel destinations, Giordano was in Florence from 1302-1305. According to John White, *Art and Architecture in Italy: 1250-1400* (New Haven, CT: Yale University Press, 1993), 309, in 1301 Giotto was listed as living in the parish of Santa Maria Novella at this time. Thus, it was possible that Giotto heard the preacher referencing his interest in optics in a sermon at the nearby church of Santa Maria Novella. Also of interest is the fact that this potential encounter could have happened just before Giotto left for Padua to paint a depiction of a mirror in the Arena Chapel.

[261] Samuel Y. Edgerton, *The Renaissance Rediscovery of Linear Perspective* (New York: Basic Books, 1975); idem, *The Heritage of Giotto's Geometry: Art and Science on the Eve of the Scientific Revolution* (Ithaca, NY: Cornell University Press, 1991); idem, *The Mirror, the Window, and the Telescope: How Renaissance Linear Perspective Changed our Vision of the Universe* (Ithaca, NY: Cornell University Press, 2009).

5.10).[262] She wears simple attire. Free from the distraction of an elaborate wardrobe, she directs her attention to the mirror and the open book propped up on a pedestal before her. She has two faces; the one in front is youthful while the one in the back appears older. Her attributes identify her ability to see the past, present, and future with equal clarity because, as described by Cicero and well known in the medieval period, "Prudence is the knowledge of what is good, what is bad and what is neither good nor bad. Its parts are memory, intelligence, [and] foresight. Memory is the faculty by which the mind recalls what has happened. Intelligence is the faculty by which it ascertains what is. Foresight is the faculty by which it is seen that something is going to occur before it occurs."[263] Thus, the older face symbolized knowledge of the past, the measuring compass and book represented one's understanding of the present, and the mirror signified knowledge of the future, or foresight.

Giotto or his workshop painted two other mirrors with similar meanings about twenty years later in the vault of the Lower Church of Assisi.[264] Within the fresco depicting the Franciscan virtue of obedience in the vault near the crossing, one finds Prudence holding a mirror out to a friar and another possible mirror set in front of the personification and seen from

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[262] For more on the figure of Prudence and the fresco cycle in addition to numerous high-quality images, see Joachim Poeschke, *Italian Frescoes in the Age of Giotto, 1280-1400* (New York: Abbeville Press, 2005). See also Guiseppe Basile, *Giotto: The Frescoes of the Scrovegni Chapel in Padua* (New York: St. Martin's Press, 2002); Bruce Cole, *Giotto: The Scrovegni Chapel, Padua* (New York: George Braziller, 1993); James Stubblebine, *Giotto: The Arena Chapel Frescoes* (New York: Norton, 1969). For more on the mirror specifically, see David P. Lackey, "Giotto in Padua: A New Geography of the Human Soul," *Journal of Ethics* 9 (2005): 551-72; Eva Frojmovic, "Giotto's Circumspection," *Art Bulletin* 89 (2007): 195-210.

[263] Quoted in Paula M. Hancock, "Transformations in the Iconography of the Mirror in Medieval Art" (Ph.D. diss., Emory University, 1988), 108-114. For more on early modern references to Cicero, see Edgar Wind, *Pagan Mysteries in the Renaissance* (New Haven, CT: Yale University Press, 1958), 260.

[264] On the vault frescoes in the Lower Church at Assisi, see Poeschke, *Italian Frescoes,* 109-113 and Kessler, "Speculum," 16.

the back (fig. 5.11). As with the figure of Prudence in the Arena Chapel, this figure's identity is revealed through an accompanying inscription, "S.PRUDENTIA," indicating this is a representation of Sacra Prudentia, or Holy Prudence, an alias for Wisdom. However, while their names are very similar, during the ancient and medieval periods there was a distinct difference between Prudence as practical knowledge and Sacred Prudence, which had a higher, usually more spiritual nature. In the apocryphal writing from the Septuagint now referred to as the Book of Wisdom or the Wisdom of Solomon, Sacred Prudence was described as "the brightness of eternal light, and the unspotted mirror of God's majesty, and the image of his goodness."[265]

The notion that the mirror could reveal divine truth was reiterated in early Christian times. In the third century, Origen wrote, "Wisdom is also called the stainless mirror of the…working of God…. For as the image formed in a mirror unerringly reflects all the acts and movements of him who gazes on it, so would Wisdom have herself to be understood when she is called the stainless mirror of the power and working of the Father."[266] Thus, the symbolic mirror, like the actual mirror, offered more visual information than was previously available.

During the Middle Ages, the stainless mirror became associated with the Virgin Mary.[267] Because Mary miraculously conceived Christ through the power of the Holy Spirit, she was able to retain her virgin state despite giving birth. Mary was likened to a mirror that allowed light to pass through the glass and reflect off the lead backing without breaking.[268] The earliest glass

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[265] Book of Wisdom, 7:26.

[266] Hancock, "Iconography of the Mirror," 109. For original translation, see Alexander Roberts and James Donaldson, eds., *Ante-Nicene Fathers: Translations of the Writings of the Fathers Down to AD 325,*vol. 4 (New York: Scribner's Sons, 1926), 251.

[267] Hancock, "Iconography of the Mirror," 114-115.

[268] The lead backing was thought to symbolize Mary's humility; see ibid., 114.

mirrors' ability to reflect the viewer and their surroundings must have provided a strikingly unusual visual experience for the early-modern viewer, since the mirror could extend one's visual field in a new direction and provide more visual information than was possible with natural eyesight alone.

In a monumental public altarpiece, his *Maestà* of Massa Marittima from the 1330s (fig. 5.12), Ambrogio Lorenzetti depicted another mirror with meaning similar to the mirrors painted by Giotto, in that it also provided a view of something not typically seen or possible to view without some type of divine aid. As Herbert Kessler summarizes, Ambrogio's mirror "captures the image of what is opposite while it shields the viewer from direct exposure."[269] He painted an enthroned Madonna and Child positioned atop three stone steps. Upon each step sits a personification of a theological virtue; from the bottom to the top, they are: Faith, Hope, and Charity. Faith holds and gazes into a mirror, which originally had silver leaf covering the now visible red bole.[270] During the 1970s this painting was closely examined and it was discovered that the reflection in the mirror originally featured two faces back-to-back and a soaring bird (fig. 5.13). Faint traces of the bird and faces are still visible in incised lines in the bole. The bird in the reflection is likely a dove, the symbol of the Holy Spirit, suggesting that Faith's mirror revealed the mystery of the Holy Trinity.

Ambrogio's inspiration for this depiction of Faith may have come from Nicola Pisano's Siena Cathedral pulpit, which featured a sculpture of Faith holding a scroll bearing the words,

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[269] Kessler, "Speculum," 32. For analysis of the other elements, see ibid., 21-33.

[270] For a detailed study of this figure see Howard Hibbard, "A Representation of Fides by Ambrogio Lorenzetti," *Art Bulletin* 39 (1957): 137-138 and Norman Muller, "Reflections in a Mirror: Ambrogio Lorenzetti's Depiction of the Trinity," *Art Bulletin* 61 (1979): 101-102. For more on the original silver facing see specifically ibid., 101.

"Now faith is the substance of things to be hoped for, the evidence of things that appear not."[271] However, unlike Pisano's inscribed scroll, Lorenzetti's attributes catered to a more visually inclined analogy. Howard Hibbard notes that Lorenzetti, by "discarding cumbersome and pedantic inscriptions, expressed their meanings by new and even revolutionary symbols."[272] Though Hibbard does not go into detail about the reception of these revolutionary elements, it is worth noting that they were optical devices rather than scrolls with text.

This change is significant, as Michael Camille convincingly equated artistic depictions of scrolls with symbols of oral forms of communication and information. For Camille, the text on the scroll represented words that were typically read aloud.[273] He noted that oftentimes a speaking figure was denoted by its possession of a scroll, an assertion he corroborated with thirteenth-century commentary.[274] In 1286 Bishop Durandus wrote that "before the advent of Christ… many things were not made clear; to represent this, the patriarchs and prophets are painted with scrolls to signify that imperfect knowledge. But because the apostles were perfectly taught of Christ, therefore the books, which are the emblems of this perfect knowledge, are open."[275] Thus, the book was seen as a symbol of writing, a medium absorbed optically, whereas the scroll indicated speech, a system of oral communication. If one accepts Camille's thesis, then it is possible to interpret Lorenzetti's transformation of the scroll into a mirror as an instance

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[271] "Fides est substantia Rerum Sperandarum Argumentum non Aparentuium." See Hancock, "Iconography of the Mirror," 121; Hibbard, "A Representation of Fides," 137.

[272] Hibbard, "A Representation of Fides," 138.

[273] Michael Camille, "Seeing and Reading: Some Visual Implications of Medieval Literacy and Illiteracy," *Art History* 8 no. 1 (1985): 29.

[274] Ibid., 31.

[275] Quoted in Michael Camille, "Visual Signs of the Sacred Page: Books in the *Bible moralisée," Word and Image* 5 no.1 (Jan. 1989): 111-130.

when the "speaking" banderole of the oral tradition morphed into an optical symbol indicative of a visually inclined culture.

Thus, as with the mirrors by Giotto and optical aids in general, the mirrors depicted by Pisano and Lorenzetti revealed more visual information to the viewer than was available without them. That the mirrors in the Arena Chapel, Lower Church, and Ambrogio's altarpiece have similar, but not identical, meanings may have been one of the reasons for the inscriptions identifying the personifications. Without labels for the virtuous personifications, the mirror's meaning could have easily been misidentified. This potential confusion reveals that the mirror's symbolic meaning depended on its context.

Testifying to the mirror's versatility was another mirror painted by Ambrogio Lorenzetti with a very different connotation. Around the same time as his Massa Marittima altarpiece, ca. 1340, Lorenzetti depicted a mirror in his cycle of the *Allegory of Bad Government* in the council chamber of the Council of the Nine in Siena's Palazzo Pubblico.[276] In this fresco, Lorenzetti painted the three primary vices of Vanity, Pride, and Avarice hovering around the enthroned personification of Tyranny (fig. 5.14). The personification of Vanity is dressed in sumptuous garb and holds a branch in one hand and a small, golden, circular mirror in the other.[277] Like the classical figure of Narcissus, she tilts her head and gazes at her captivating reflection in the small mirror. Her elaborate golden headdress is an adornment worthy of Venus herself. When Vanity saw herself reflected in the mirror, her headpiece would have produced a shimmering golden

[276] For more on this fresco cycle, see, Diana Norman, "'Love Justice, You Who Judge the Earth:' The Paintings of the Sala dei Nove in the Palazzo Pubblico, Siena," in her *Siena, Florence, and Padua: Art, Society and Religion: 1280-1400,* vol. 2 (New Haven, CT: Yale University Press, 1995), 145-167.

[277] Hancock, "Iconography of the Mirror," 155 noted that this is the earliest instance of Vanity holding a mirror.

aura surrounding her face, almost like that produced by a halo. Vanity's virtuous counterpart on the adjacent wall is Hope, who, instead of being absorbed with superficial earthly appearances, views God's face and his golden virtuous halo directly (fig. 5.15).

Thus, the pair of mirrors by Lorenzetti, the one in the hands of the Massa Marittima Faith and that in the hands of Vanity in the Palazzo Pubblico, illustrate the complexity of the mirror's meaning and also illustrated its most famous symbolic reference by St. Paul, discussed in more detail in chapter 6. In 1 Corinthians 13:12, Paul wrote, "For now we see through a glass, darkly; but then face to face: now I know in part; but then shall I know even as also I am known." Thus, this is a situation where two mirrors painted around the same time by the same artist held two completely divergent meanings. Whether the mirror symbolized good or evil depended on context.[278]

Authors also used mirrors as a potent symbol throughout early modern literature. Literature, especially in the vernacular, was a form of information and entertainment that was growing in the late medieval period. Thus, as the book came to replace the scroll in art, silent, individual reading and visual imaginings replaced oral, group-oriented reading.[279] Also increasing was the use of the word *speculum* in medieval literature. As Heinrich Schwartz noted, "The metaphorical use in literature of the word *speculum* to indicate the complete and precise

[278] Other examples of depictions of mirrors with various meanings support this conclusion. They include: Andrea di Bonaiuto's depiction of a mirror held by Wisdom in the roundel at the pinnacle of St. Thomas Aquinas's throne in the Spanish Chapel of Santa Maria Novella from ca. 1366; the mirror held by an angel in the pinnacle of Giotto's Baroncelli Altarpiece from ca. 1333 in San Diego; and Buffalmacco's fresco of Hell in the Pisa Camposanto from ca. 1335 featuring a mirror in the hands of one of the damned souls in the bottom right corner. For general notes on the Spanish Chapel see Poeschke, *Italian Frescoes*, 362-365. For comments on fresco in Pisa, see Luciano Bellosi, *Buffalmacco e il trionfo della morte* (Milan: 5 Continents Editions, 2003). The most comprehensive discussions on the symbolism of the mirror are found in Kessler, *Speculum* 1-41 and Hancock, "Iconography of the Mirror," 80-174.

[279] For more on the shift to silent reading see Crosby, *The Measure of Reality,* 134.

image of a theme, although extending back into antiquity, becomes particularly frequent following the thirteenth century."[280]

Further solidifying the relationship between literature and an interest in visual cultures was the fact that many of the most widely read works of medieval literature employed highly detailed visually descriptive language and used the mirror and sight as metaphors. The *Roman de la rose* was a French poem written by two different poets over the course of the thirteenth century that presented an allegory of ideal courtly love.[281] The poem opens with a dream sequence, a literary trope that references the contemporary debate over the validity of visionary dreams. Once asleep, the protagonist, referred to as the Dreamer, encounters the Garden of Love enclosed within a formidable wall and guarded by a beautiful personification of Idleness who, among other things, holds a mirror. She allows the Dreamer to enter the garden and, once inside, he encounters the fountain of Narcissus and has to fight the seductive powers of his reflection in order to progress on his journey to meet his true love, symbolized by the Rose. This infamous reflective pool had an ancient history as the place where Narcissus futilely fell in love in with his own reflection and therefore was similar in meaning to the mirror held by Lorenzetti's depiction of vanity.

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[280] Heinrich Schwartz, "The Mirror in Art," *Art Quarterly* 13 (1952): 103. For more on this, see Sister Ritamary Bradley, "Backgrounds of the Title *Speculum* in Medieval Literature," *Speculum* 29 (1954): 100-115 and Herbert Grabes, *The Mutable Glass: Mirror-Imagery in Titles and Texts of the Middle Ages and English Renaissance* (Cambridge: Cambridge University Press, 1983).

[281] Guillaume de Lorris and Jean de Meun, *The Romance of the Rose,* trans. Charles Dahlberg (Hanover, NH: University Press of New England, 1986). For specific references to the mirror and optics in this text, see Hancock, "Iconography of the Mirror," 149-153 and Crosby, *The Measure of Reality*, 171.

Dante's *Divine Comedy,* from around 1310, describes a pilgrim's journey for the revelation of divine light.[282] Dante the Pilgrim traverses the dark lands of Hell and Purgatory before his arrival in Heaven where he, for a fleeting, brief moment, glimpses the divine glory of God. Throughout the course of the poem, Dante refers to a mirror no less than thirty times.[283] One such instance occurs when the pilgrim encounters Rachel and Leah in Canto 26 of Purgatory. The former, emulating Venus, uses the mirror for vain purposes and the latter, in the manner of Faith, uses it contemplate deeper truths.[284] Then in Canto 2 of Paradise, Beatrice, having assumed the role of Dante's guide, explains that the dark spots on the moon are not due to different matter reflecting light differently, but rather to the object's ability to reflect divine

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[282] Dante, *Divine Comedy,* in *The Portable Dante,* trans. Mark Musa (New York: Penguin, 1995), 3.

[283] H.D. Austin, "Dante and Mirrors," *Italica* 21 no. 1 (March 1944): 13.

[284] Dante, *Divine Comedy*, 350. Another interesting connection between the Massa Marittima altarpiece and Dante's poem is the fact that Dante described colored stairs leading to paradise that match those depicted by Lorenzetti, and compares one of these steps to a mirror:

We reached the steps. White marble was the first,
and polished to the glaze of a looking glass;
I saw myself reflected as I was.
The second one was deeper dark than perse,
of rough and crumbling, fire-corroded stone,
with cracks across its surface—length and breadth.
The third one, lying heavy at the top,
appeared to be of flaming porphyry,
red as the blood that spurts out from a vein;

(Purgatory 9, verses 94-102; ibid., 244) As far as I am aware, this connection has not yet been made. If Lorenzetti knew Dante's work, he could have been inspired by the steps but also by the symbolism of the mirror in the verse and throughout the poem.

illumination solely to the extent that God allowed it. She makes her divine logic clear to Dante by performing an experiment involving three mirrors.[285]

In addition to the portrayal of mirrors, eyeglasses were also painted at an increased rate from around mid-century onwards, likely because of the increasing interest in vision as well as their growing availability. Documentary evidence suggests eyeglasses were first made around 1285 near Pisa and, at least by 1306, a large public knew of their invention.[286] In 1306—only one year after Giotto painted the earliest extant depiction of an early-modern mirror—a contemporary chronicler recorded how the preacher Fra Giordano described the recently invented eyeglasses to the crowd in his Lenten sermon and thus spread the news of this technological development to the general Florentine public.[287] As the chronicler noted, "It is not yet twenty years since there was found the art of making eyeglasses, which make for good vision, one of the best arts and most necessary that the world has. And it is so short a time that this new art, never before extant, was discovered. And the lecturer [Giordano] said: I saw the one who first discovered and practiced it, and I talked to him."[288] That news of this invention spread from preacher to public demonstrated that these visual aids were not seen as necessarily deceptive.[289] Again, like the mirror, eyeglasses could be used to augment one's natural sight and increase one's spiritual virtue.

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[285] For further discussion of the three-mirror experiment, see Hancock, "Iconography of the Mirror," 170-172.

[286] For an extensive summary on the literature discussing the invention of eyeglasses, see Ilardi, *Renaissance Vision,* 3-49.

[287] Ibid., 5.

[288] Quoted in ibid., 5.

This was certainly the case when men of the cloth were depicted with various forms of lenses by Tommaso da Modena (1325/6-1379) in 1352. Tommaso painted a fresco series depicting forty famous Dominicans in the Chapter House at San Nicolò, Treviso.[290] Within the series, the portrait of Cardinal Hugh of St. Cher (ca. 1200-1263) is anachronistically depicted using an early form of eyeglasses (fig. 5.16), Cardinal Nicholas of Rouen (d. 1325) is shown with a magnifying glass (fig. 5.17), and the preacher Pietro Isnardo da Chiampo of Vicenza (d. 1244) is painted with a concave reading mirror on his shelf (fig. 5.18).[291] Not long after he painted the Chapter House, the Dominicans in Treviso commissioned Tommaso for additional work in the church. There he painted an image of St. Jerome (ca. 341-420) on a nave column, with a reading mirror in a leather case resting on Jerome's shelf.[292]

Later in the fourteenth century, several other artists included depictions of eyeglasses. In 1367, less than a decade after Tommaso's paintings, Andrea dei Baroli, a Bolognese contemporary of Tommaso, depicted eyeglasses and a magnifying lens in the Lower Church at Assisi. In the chapel dedicated to the early Christian martyr, St. Catherine, he painted the scene *Philosophers Confronting St. Catherine* (fig. 5.19). Because of her steadfast faith and high education, Catherine was able to convert pagan philosophers and the wife of the Emperor. Then,

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[289] For more on the popularity of Giordano's comments see ibid., 21-22 where Ilardi notes that Giordano's sermons that were recorded in the vernacular numbered roughly seven hundred and were widely disseminated. For more on this, see Daniel R. Lesnick, *Preaching in Medieval Florence: The Social World of Franciscan and Dominican Spirituality* (Athens, GA: University of Georgia Press, 1989), 111.

[290] For more on Tommaso and his work in Treviso see, Robert Gibbs, *Tomaso da Modena: Painting in Emilia and the March of Treviso, 1340-80* (Cambridge: Cambridge University Press, 1989), 50-87, 257-267.

[291] Ibid., and Ilardi, *Renaissance Vision*, 19-21.

[292] Ilardi, 20.

in 1382, Giusto de' Menabuoi painted his *Miracle of the Tower* in the Chapel of the Beatified Luca Belludi in the Basilica of St. Anthony, Padua, which included another early depiction of eyeglasses (fig. 5.20).[293]

Further attesting to the close connections between eyeglasses and the clergy was the fact the friar Alexander della Spina—who, like Fra Giordano, met the unnamed inventor in Pisa—actually manufactured eyeglasses. In the *Ancient Chronicle of the Dominican Monastery of St. Catherine in Pisa*, the friar Bartolomeo da San Concordio (d. 1347) recorded that

> Friar Alexander della Spina, a modest and good man, whatever he saw that had been made, he knew how to make it. Eyeglasses, having first been made by someone else, who was unwilling to share them, he [Spina] made them and shared them with everyone with a cheerful and willing heart. He knew how to sing, write, illuminate [manuscripts] and everything which mechanically skillful hands can do. Ingenious in corporeal things, by his ingenuity he made himself a room in the house of the Eternal King.[294]

Not only did Spina spread word of the invention, he spread the actual product and, by doing so, earned spiritual virtue. Thus, even if the initial inventor kept his craft secrets, because of industrious individuals like Spina, knowledge and use of eyeglasses spread quickly.[295] As Ilardi pointed out, after observing one pair of glasses, one could easily imitate the basic idea.[296]

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[293] For other instances of eyeglasses, see Chiara Frugoni, *Medioevo sul naso: Occhiali, bottoni e altre invenzioni medievali* (Rome: Laterza, 2001).

[294] Cited in Ilardi, *Renaissance Vision*, 6.

[295] Ibid., 22 notes, "Once the process of making glasses had been revealed, it would not have taken long for artisans and monks everywhere to learn the craft and satisfy the enormous demand for an article that extended the comfortable working life of people in virtually all professions. Despite the scarcity of early documents, one can be bold in assuming therefore, that the diffusion of the invention must have radiated rapidly and widely within the much-traveled community of monks, scholars, and merchants…. In brief, by the time Tommaso da Modena painted his frescoes, almost three generations of persons in Italy and probably outside the peninsula had used spectacles, and knowledge of them and perhaps of their place of origin, must have been

Glass Production

As suggested by the increasing number of depictions, glass products had become significantly more available in the fourteenth century than in previous centuries in the Latin West.[297] Originally, glass was invented around 3000 BCE near Egypt or Mesopotamia; however, the earliest glass was opaque, not transparent.[298] It was not until the first century BCE that glassmakers developed the technique of glass blowing and could create high quality, thin, and transparent glass.[299] After its invention somewhere near present day Syria or Iran, transparent glass was not used widely or in the same ways in all glassmaking circles.[300] The ancient Roman and the late-medieval European industries were the two primary industries to most effectively

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widespread given the announced intention of the Dominicans to spread the word for the benefit of mankind."

[296] Ibid., 7.

[297] In addition to the mirrors and eyeglasses discussed, there were also an increasing number of transparent glass drinking vessels and containers depicted in Trecento art by some of the most famous artists of the time: Duccio's *Last Supper* from the *Maestà* for Siena's cathedral included transparent glass drinking vessels, Giotto's Arena Chapel included an illusionistic chandelier with transparent glass lamps, and Taddeo Gaddi's Baroncelli Chapel featured an illusionistic cupboard with transparent glass vases.

[298] Macfarlane, *Glass,* 10-12.

[299] Ibid., 12-13.

[300] Ibid., 12. Macfarlane, 6 notes that "glass was practically non-existent in most civilizations and… where it was present, its role has varied enormously... [and] it does not follow that once glass has been invented it will be used and also that some civilizations used glass and then gave it up."

capitalize on transparent glass's many and varied applications. However, the ancient Romans did not use it for windows, mirrors, and lenses as much as the late medieval Europeans would.[301]

It was in the late medieval Latin West that one finds the most evidence of Macfarlane's theory that glass fostered new views and ideas. As Macfarlane notes, "the long-term consequence of the perfecting of clear glass manufacture was the development of glass as a thinking tool, through mirrors, lenses, and spectacles."[302] Certainly, there was a decline in European glass production after the fall of Rome; however, Macfarlane convincingly argued there was not a complete destruction of the industry.[303] Rather, the Italian peninsula continued to develop and preserve techniques, especially in the area around Venice.[304]

By the thirteenth century, Venetian glass was thriving and influencing the rest of Europe, and the Venetians continued to develop their techniques into the Trecento.[305] That the transparent glass being produced in late-Duecento Venice was of very high quality is evidenced by the mandate prohibiting glassmakers from imitating crystal that was issued in 1284 and again

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[301] Ibid., 15-20.

[302] Ibid., 14.

[303] Ibid., 17-18 notes that the archeological evidence has suggested this because it does not provide many samples. However, Macfarlane identifies several reasons why archeologists did not find samples of medieval glass: they were not looking for it, it was recycled and thus not left for them to find, it was not being buried in graves as Christianity rose in popularity, and the glass made in Europe after the ninth century used potash made from woodland plants rather than marine plants and thus its decay was more severe.

[304] Ibid., 21. For other important Italian and non-Italian centers of production including Altare, Padua, Mantua, Ferrara, Ravenna, and Bologna in Italy, as well as Germany, France, Flanders, and Britain, see ibid., p. 22-23. For more on the Venetian glass industry specifically, see Patrick McCray, *Glassmaking in Renaissance Venice* (Brookfield, VT: Ashgate, 1999).

[305] Macfarlane, *Glass,* 21 and Ilardi, *Renaissance Vision,* 7.

in 1300.[306] In 1321 Venice was exporting such a high volume of eyeglasses that they had established a five percent export duty.[307] The Venetian community of mirror and drinking-glass makers had become so numerous by 1321 that they required appropriate designation within the Order of the Merchants in the city."[308] There is also evidence that Pisa had a thriving glass industry at least from the early years of the fourteenth century and possibly earlier.

In summary, the evidence indicates that there was a growing interest in sight, transparent glass devices, and optical symbolism. The increasing number of depictions of optical devices and the important spiritual emphasis on visual symbolism combined with the fact that mirrors and eyeglasses could enhance one's visual experiences—either by revealing that which is not seen (as in the case of the mirror) or by improving one's apprehension by seeing more clearly what is there (as in the case of eyeglasses)—suggest that glass functioned as a "thinking tool" in that it contributed to a shifting view of the world based more on an optical relationship. With this new attitude in mind, it may be possible to investigate reliquaries that used transparent glass roundels in a consistent manner as both reflections of this cultural trend and stimulants for further investment in the visual encounter with the holy relics.

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[306] Ilardi, *Renaissance Vision,* 8. Ilardi, 11 notes that "this breakthrough in glass technology may have been the result of the use of superior Levantine (mostly Syrian but also Egyptian) alkali ashes being imported into Venice from about 1375 or earlier for the making of glass and soap." For more on this see Eliyahu Ashtor and Guidobaldo Cevidalli, "Levantine Alkali Ashes and European Industries," *The Journal of European Economic History* 12 no. 3 (1983): 487-91.

[307] Ilardi, *Renaissance Vision,* 9.

[308] Ibid., 7, 12. For more on the glass industry in Pisa, see Tito Antoni, "Note sull'arte vetraria a Pisa fra il Tre e il Quattrocento," *Bollettino storico pisano* 51 (1982): 295-309.

Reliquaries with Glass Relic Windows

The growth of the relic trade and travel to the Holy Land in the thirteenth and fourteenth centuries inspired the growth of the reliquary market. In particular, one saw the increased production of portable reliquaries and reliquary altars in the form of panel painting or triptych.[309] Relics were more readily available through pilgrimage or through the expanding relic trade, which was experiencing an influx of relics from Byzantium, where regulations over handling and dividing relics were more relaxed than in the West.[310] As the number of relics increased in the West, their rarity—and, in a sense, value and prestige—decreased. There was also growing concern about forgeries and the way in which the relics were venerated.[311] In order to preserve the sacredness of the relics and ensure that the faithful did not treat them as magical talismans or protective amulets, the church attempted to impose regulations. At the Fourth Lateran Council of 1215, the church declared that relics were not allowed to be worshipped unless they were in an appropriate container and sanctioned by the authority of a bishop.[312]

Reliquary tabernacles with visible relics offered viable solutions to many of the church's growing concerns regarding relic veneration. Firstly, the reliquaries encased the relics, providing them with a container. Secondly, the format of the reliquaries, which featured a vertical composition framed by a central pointed arch and flanked by spires on either side, emulated the architectural model of a Gothic church and therefore literally and symbolically enshrined the

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[309] Rowlands, "Sienese Painted Reliquaries," 124.

[310] Ibid.

[311] Ibid., 125.

[312] Ibid., 125 n. 25, "Ne reliquiae sanctorum ostendatur extra capsam; ne novae habeantur in veneratione sine Romana ecclesia." Transcribed in Ernst Günther Grimme, *Goldschmiedekunst im Mittelalter: Form und Bedeutung des Reliquars von 800 bis 1500* (Cologne: DuMont, 1972), 164.

relics within the church's authority. The display of these reliquaries within a chapel further associated the objects with the church and deterred from their use as wearable protective amulets. These relics could not be worn around one's neck or treated as apotropaic devices.[313] Instead, they were firmly set within the authority of the church as a physical structure and, in turn, as an institution. The church's official approval of these relics was also certified by the presentation of the relics' authentics and the assumed blessing of heavenly saints painted on the reliquaries. Other ways in which the church authenticated the relics and their divine powers was through the important inscriptions, materials, and network of various relics, and thus, saints, working as a unified chorus.[314]

Having investigated some of the technological, optical, and spiritual implications of glass during the Trecento, it is important to consider how these associations might have influenced viewers' interpretations of the prominent use of glass in reliquaries. Because the reception of glass depended largely on its context, an examination of the glass in the reliquaries should also consider the relics, the other decorations in the reliquary, and the spiritual and artistic contexts of the work.

Artists made many different types of Trecento reliquaries that displayed their relics behind sheets of glass. Because this study is most interested in glass as a medium and viewing the relics, what follows will focus on the reliquaries that used glass and visible relics prominently and in a consistent manner. In the case of Lippo Vanni's reliquary from the Walters Art Museum (fig. 5.2), Naddo Ceccarelli's from the same collection (fig. 5.1), and Bartolo di Fredi's in a private collection (fig. 5.7), each reliquary featured transparent glass roundels displaying

[313] Ilardi, *Renaissance Vision,* 10.

[314] Hahn, "Reliquaries," 289-290.

relic fragments distributed around naturalistic imagery in a portable altar tabernacle or triptych. Helping to solidify this group is the fact that these three reliquaries were all made in mid-fourteenth-century Siena.

However, it should be noted that the comments and analysis made here could also apply to varying degrees to the other reliquaries with visible relics and glass compartments. It is worth noting that other reliquaries from this same period also put relics on display using materials other than glass or used rectilinear panels of glass rather than round ones. The earliest example of round relic compartments comes from a late-thirteenth-century work from the circle of Guido da Siena (fig. 5.21).[315] In this reliquary, the protective compartments for the relics were made of a painted metal framework, not transparent glass. A possible explanation for this choice may have been the lack of accessible transparent glass at this early time. Another late-thirteenth-century reliquary, the *End of a Reliquary Shrine with the Triumphant Christ* from the Walters Art Museum (fig. 5.22), achieved an effect similar to that produced by transparent glass with sheets of translucent horn. Again, it is worth considering whether the early date of this object precluded the use of glass because it was not yet widely available to all craftsmen. Interestingly, the artist of this reliquary obviously had access to rock crystal, a material sometimes used to cover valued relics or otherwise important things. However, in this reliquary, the crystal does not cover the relic but was used more like a gemstone, that is, it was meant to be appreciated on its own merit rather than in relation to the relics. This practice indicates crystal was not always the preferred material for covering relics.

One of the earliest reliquaries that featured glass compartments is the *Reliquary Diptych with Virgin and Child with Saints* in the Victoria and Albert Museum (fig. 5.23). This diptych is

[315] This object is discussed and illustrated in Rowlands, "Sienese Painted Reliquaries," 129-130.

dated to 1300-1320 and included depictions of various saints: Blasius, Nicholas, Bartholomew, Mary Magdalen, Urban, Agatha, Anthony, John the Evangelist, Scholastica, and Agnes. Other examples featuring different arrangements include Simone di Filippo's (di Crocifissi) diptych from ca. 1360s in the Walters Art Museum (fig. 5.9), which was originally part of a larger ensemble as indicated by missing hinges. In the spandrels between the narrative imagery are rectilinear relic compartments of inconsistent sizes covered with sheets of glass. Among these cavities, in the uppermost register of the left panel, are four small, circular relic windows. In the following decade, this same artist produced another reliquary very similar in nature to those by Ceccarelli, Vanni, and Fredi. In his *Reliquary Triptych with the Virgin and Child, St. Baptist, Mary Magdalen, and the Annunciation* now in the Louvre (fig. 5.8), Simone flanked the central painted panel with a ring of relic chambers that were originally filled with sheets of transparent glass.[316] However, Simone's treatment of these cavities is slightly different from those by Ceccarelli because the artist carved the relic chamber into a quatrefoil form, which distracted from the circular shape.

Of all the Trecento reliquary tabernacles with glass roundels that belong to the primary type under discussion here, the work by Naddo Ceccarelli from ca. 1350 now in the Walters Art Museum (fig. 5.1) has received the most scholarly attention because of its excellent state of physical preservation and the scholarly consensus regarding its attribution to Naddo Ceccarelli.[317] It is characteristic of Ceccarelli's style in its extensive use of gilding and the

[316] Simone's interest in transparent glass may have been inspired by his contact with his fellow Bolognese artist, Tommaso da Modena, who depicted optical devices and, as will be discussed in chapter 6, also incorporated glass into a reliquary panel.

[317] See Rowlands, "Sienese Painted Reliquaries," 123; Mann, "Relics," 251-259; idem, "Naddo Ceccarelli, Reliquary Tabernacle with Virgin and Child," in *The Walters Art Gallery: Guide to the Collection* (London: Scala Books, 1997), 24.

architectural emphasis, which reflected the work of contemporary goldsmiths as seen in Ugolino di Vieri's *Reliquary Head of St. Savinus.*[318] Characteristic of this artist's style, the figures and garments were painted in a delicate, yet precise manner, showing this artist's debt to Simone Martini.[319]

Ceccarelli's panel followed the conventions for this type of small shrine in that it emulated the aedicule shape.[320] Eliot W. Rowlands argues that this was intentional as the reliquary was meant to symbolize the church with the Madonna serving as the gate to heaven, the *porta caeli,* and the relics symbolizing the family of saints within the church.[321] Rowlands asserts that these roundels derived from Byzantine art and finds them to be correlations to the painted roundels in the frames of panels such as Duccio's *Ruccellai Madonna* and Simone Martini's *Maestà* in the Palazzo Pubblico.[322] C. Griffith Mann supports this assessment, calling

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[318] Rowlands, "Sienese Painted Reliquaries," 128. This reliquary is illustrated in ibid., 129.

[319] Ibid., 123.

[320] Ibid., 123, 128.

[321] Ibid., 123-124 incorrectly identifies the relics. C. Griffith Mann's catalog entry on this object ("Naddo Ceccarelli," 24), corrects this, noting, "Relics identified by inscriptions: (inner frame, clockwise from top) illegible (pair), illegible, a bone of Saint John the Baptist, a stone from the column of the flagellation, illegible, a stone from Calvary, a stone from…[illegible], a stone from the place where Christ's cross was found, illegible, a nail from the gates of Jerusalem (?), a relic from the sepulcher of… [illegible], illegible, illegible, a stone from the sepulcher of Saint John the Evangelist, a stone from the ground where the wood of the cross stood (?), a stone associated with Mary Magdalene, a piece of the stone from which Christ ascended, illegible, a stone from the sepulcher of Christ, illegible, a stone from the sepulcher of Christ; (left pilaster from top down) bones from Saint Barnabas the Apostle, a fragment of the tunic of Saint Francis; (right pilaster from top down) illegible, illegible, a piece of the tunic of Saint Agnes (?), a relic of Saint James the Apostle, a relic of the sepulcher; (rectangular chamber from left to right) the bones of Saint Peter Martyr, relic of Saint Damascus Pope, the bones of Saint Gregory the Great, a relic of Saint Alexis, a stone from the temple of God, stones used in the martyrdom of Saint Stephen, an illegible saint's relic, and a relic of the True Cross (?)."

[322] Rowlands, "Sienese Painted Reliquaries," 129.

the roundels in the frame and the painted Madonna "a confrontation between matter and spirit."[323] Indeed, both the church as an institution and the reliquary by Ceccarelli were points of intersection between the spiritual and material realities.

This study agrees with the assessments of Rowlands and Mann and would like to add to them by applying a similar line of reasoning to Ceccarelli's reliquary as well as extending the analysis to the reliquaries of a similar type. Implicit in the juxtaposition between physical and spiritual elements in Ceccarelli's reliquary is a confrontation between empirical validation and faith. The relics were authenticated by a series of different authorities and therefore the saints represented were confirmed to have lived, died, and joined the heavenly court in heaven. However, when considering the imagery at the center and the lack of primary relics belonging to Christ and the Virgin Mary, one is confronted with the reality that the physical bodies—and relics of them—belonging to the Virgin Mary and Christ were firmly out of reach because these holy figures were assumed into heaven in both body and spirit. One's understanding of their human existence and heavenly afterlife therefore was based on belief in the stories from the Bible and doctrine of the Christian church.

The reliquary's format evoked the church as a physical structure and as a spiritual institution; positioned within the framework of the tabernacle, the saints' relics functioned like symbolic walls of the church. Like the ribs of the Gothic cathedrals, these fragments of bones and stones supported the pointed arch and pinnacles above the Madonna and Child.[324] The saints were both symbolically and visually the foundation and support for the church. As Origen's commentary on the Gospel of John said, "Christ was a stone, set at naught by the builders but

[323] The quote is from Mann, "Relics," 252; discussion of this topic continues to p. 257.

[324] As the catalog of relics from Mann, "Naddo Ceccarelli," 24 (listed above) indicates, the group of relics contains a large group of stones and bones.

placed on the head of the corner, for the living stones are built up as on a foundation on the other stones of the Apostles and prophets."[325] When set upon a chapel altar, this reliquary could have offered compelling evidence that the heavenly and earthly worlds were connected and that one's faith would help one ascend to the divine afterlife.

Lippo Vanni, a Sienese contemporary of Ceccarelli who was also influenced by Simone Martini, created a similar reliquary at approximately the same time as Ceccarelli that also featured prominent glass roundels as windows to relics surrounding a central image of the Virgin and Child (fig. 5.2). Unlike Ceccarelli's reliquary, however, Vanni's used the triptych format. When the two outside panels were open, the reliquary could have supported itself for use as a portable altar. This functional requirement necessitated a different distribution of the relic chambers. Rather than surrounding the central panel, these glazed compartments were confined to the central panel, filling the space above and below the enthroned holy family but not surrounding it on the sides. The wings of this triptych do not have the structural integrity to support the relic chambers, which required a deeper armature than the wings could have allowed. Rather than the saints represented as relics, the areas to either side of the Virgin and Child are filled with painted descriptions of the saints such as St. Aurea, St. John the Baptist, and St. Dominic.

Several other extant reliquaries that display visible relics suggest that Vanni's arrangement was an anomaly that may have been due at least in part to the fact that it did not have a proper pedestal to support it and that it may have been preferable to entirely surround the central imagery with a framework of relic chambers. In another reliquary triptych by the same

[325] Allan Menzies, D.D., ed., *The Ante-Nicene Fathers: Translations of the Writings of the Fathers down to AD 325,* original supplement to the American edition, vol. 9 (New York: Charles Scribner's Sons, 1912), 319.

artist now in the Vatican Collection (fig. 5.3), Vanni encircled the painted figures with the relic chambers. Likewise, the Cleveland Museum's Reliquary Frame, discussed in chapter 7, featured relic roundels surrounding the central panel.[326] Thus, in other examples, the relation of the relics to the central imagery seems to have been consistent.

Like the Cleveland frame and Ceccarelli's panel, Bartolo di Fredi's *Reliquary Triptych with the Annunciation, St. Ansanus, the Adoration of the Magi, and the Crucifixion* (fig. 5.7) from the mid-fourteenth century (private collection, London) also features relic roundels framing the central scene and enhancing the idea that the relics acted like bones or structural support for the symbolic chapel. Bartolo's reliquary has two side wings with painted imagery that could fold inward to cover and protect the central panel with its ivory reliefs of the Adoration and Crucifixion, painted portrait of St. Ansanus, and glass-covered relic chambers. This feature, combined with its prominent base, would have allowed it function in a way similar to a large altarpiece. It could have been set upon the altar at all times; on non-feast days when it might have been in the closed position, it could have functioned as a reminder of the presence of the relics. On special occasions, it could have been left opened to reveal the relics and imagery.

Bartolo's reliquary appears to support and advance the notion that such reliquaries functioned as symbolic chapels, especially when considering the treatment of the wings in relation to the central panel. When the side panels were opened, the smaller pinnacles created by the side panels flanked the larger pointed arch at the center. Such a format resembled a style of church façade popular in the fourteenth century as demonstrated by the façades of the cathedrals in Siena and Orvieto. One finds the same architectural elements—three pointed arches—repeated at the top of the ivory panels at the center of Barolo's reliquary. As many altarpieces

[326] As this work combined these relic roundels with verre églomisé panels, it will be more fully discussed in chapter 7 after a consideration of verre églomisé reliquaries. See fig. 7.1.

and chapels used similar architectural forms, this juxtaposition between the triptych panel and the ivory reliefs could have contributed to the sense that the entire panel represented a chapel and the ivory reliefs, an altarpiece set within the chapel. In such a situation, the images of Gabriel and the Virgin Annunciate on the side panels would have framed the central scenes of the Adoration and Crucifixion depicted in the ivories. Thus, Christ's entire life, from his early childhood to his death, would have been physically and symbolically framed by the communication between Gabriel and the Virgin Annunciate.

Arranging Gabriel and the Virgin Annunciate across physical space, as if their communication spanned and thus sanctified it, was not unique to this reliquary. The most famous early-fourteenth-century example is Giotto's *Annunciation* in the Arena Chapel but it can also be found at the Baroncelli Chapel in Santa Croce, Florence. This chapel incorporated stained-glass windows and a fresco cycle by Taddeo Gaddi and an elaborate polyptych altarpiece by Giotto and his workshop. Just before entering the Baroncelli chapel, one finds sculptures of the Angel Gabriel on the left and the Virgin Annunciate on the right by Giovanni di Balduccio from 1327 set upon pedestals on either side of the entry portal (fig. 5.24).[327]

That Bartolo may have appreciated such an arrangement is suggested by the fact that in the 1380s he made a large polyptych of *The Coronation of the Virgin* (fig. 5.25) for the shoemaker's guild in Montalcino. For this same chapel, the guild had also commissioned two over-life-sized sculptures of Gabriel and the Virgin Annunciate (fig. 5.26) from Angelo di Nalduccio, which were likely set up on either side of Bartolo's altarpiece.[328] Bartolo's reliquary

[327] Diana Norman, "Those Who Pay, Those Who Pray and Those Who Paint: Two Funerary Chapels," in her *Siena, Florence, and Padua*, vol. 2, 171.

triptych would have effectively recreated a similar spatial situation when the wings were partially open. Such an arrangement would have allowed Gabriel and the Virgin to make more direct eye contact and simultaneously pushed them forward in space, suggesting that they stood before the imagery in the central panel and, in a sense, mediating the viewer's experience of the imagery in the central panel.

It is possible that the reliquaries discussed here combined various media such as glass, paintings, and, at least in the case of Bartolo's, ivory, to evoke the transition that Christ and the saints made between the spiritual and material realities. Such a theory would highlight the most important function of any reliquary: to bring to life the fragments of bone and stone by setting them within their theological context. Like Francis of Assisi's view on the Eucharist mentioned earlier, these bones, stones, and cloth were tangible loci of the intersection between heaven and earth. As Mann observed, "This program takes its point of departure from the wings, which introduce the theme of spirit's entry into matter. Combined with episodes from the beginning and the end of Christ's earthly life, the relics extended the theme of the Incarnation into the core of the object. Moreover, the move from painted to sculpted decoration reinforced the shift from spiritual to physical presence."[329] By combining different media to express the different states of being, divine and earthly, reliquaries such as Bartolo's emphasize the transitions between heavenly to earthly. Supporting this emphasis on the transitory are the implied sight lines throughout the piece. Gazes and gestures guide the viewer from God the Father down to the

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[328] Catherine King, "The Arts of Carving and Casting," in *Siena, Florence, and Padua: Art, Society and Religion: 1280-1400*, ed. Diana Norman, vol. 1 (New Haven, CT: Yale University Press, 1995), 116-117.

[329] C. Griffith Mann, "Reliquary Triptych with the Annunciation, St. Ansanus, the Adoration of the Magi, and the Crucifixion," in *Treasures of Heaven: Saints, Relics, and Devotion in Medieval Europe*, eds. Martina Bagnoli and others (New Haven, CT: Yale University Press, 2010), 205.

Angel Gabriel and then over to the Virgin. Then, when coming to the center panel, one works one's way up from the stories of Christ's life to St. Ansanus, whose prominent gaze upward points to the relics and, ultimately, heaven. In following these lines and what they represent, this reliquary, and others like it, could have served as portals for the spiritual imagination. By using one's earthly sight to attain spiritual insights, the viewer went on the imaginative journey from earthly to spiritual realities.

The formal elements of the glass relic-windows in all three of the reliquaries discussed are not only important to understand because they reveal the relics but because, visually, these round cavities create a strong visual impact on the entire composition. The perfectly round circles evoked the forms found in eyeglasses and magnifying lenses in that they were transparent, round pieces of glass, which allowed one to see the relics in a new way. As with eyeglasses and mirrors, the glass relic-window offered a visual advantage not possible without it. This openness was a departure from earlier reliquaries such as the *Staff of St. Peter* that encased the precious relics inside layers of gold, gems, and various spolia.[330] The Trecento reliquaries with transparent glass roundels allowed one to protect and encase the holy relics while simultaneously revealing them and allowing for visual contact.

Other connections strengthen the case for a link between the glass roundels and issues related to looking. By juxtaposing the naturalistic figurative imagery with the relic-windows, the reliquaries seem to emphasize the importance of the role of earthly sight in the pursuit of divine

[330] Of the *Staff of St. Peter,* Hahn, "Reliquaries," 287 notes, "Typical of reliquaries made in the western medieval world, this golden staff holds its relic tightly and invisibly, inaccessible to either devout or skeptical eyes." Elaborating on this idea, Hahn, 290 notes, "While at the same time the relic is thus made 'fully visible' in its power and associations, it is also unquestionably hidden from view. Obscured by a glittering container covered with gems (meaningful even in its very materials), it was given very specific value in an elaborate system of provenance and exchange, exchange through gift, theft, or even invention."

insight. Using one's powers of observation—honed to more careful looking due in part to the new optical technology and interest in the natural world—one could study the realistic representations of the holy figures and appreciate their life-like qualities. Thus, by viewing the three-dimensional, highly detailed, and realistically modeled depictions of the Virgin Mary and Christ Child within a framework of relic fragments, the viewer could simultaneously reflect on both the human existence of the divine saints as well as their eternal life after death.

In conclusion, the extant artworks suggest that, beginning in the late 1100s and running throughout the Duecento and Trecento, the public's desire to directly view relics was rising and, at the same time, theologians were capitalizing on vision as a spiritual metaphor, and the market was responding to the increasing demand for high-quality eyeglasses and mirrors. Because of the prominent role played by transparent glass in some Trecento reliquaries it is important to consider the possibilities that all these cultural currents conflated with and informed one another. Thus, when analyzing these Trecento Italian reliquaries featuring glass roundels, one should closely consider the ways they could have potentially resonated with both their eastern and western associations. On the one hand, they were a continuation of the eulogia tradition and embedded with strong geographical connections to the Holy Land. They were also imbued with a sense of virtue, verging on magic, because of the medium's early strong correlations with rock crystal. On the other hand, the small glass relic-windows came to represent something new with the developing glass industry and optical science in the west. They were thin, flat, and without the distorting effects of crystal. In this respect, the use of glass calls upon its role as Aristotle's intervening medium, an element crucial for establishing a visual connection. Thus, through exploring the potential benefits of seeing these various cultural influences as related and working together to inform the Italian glass reliquaries, one can appreciate the ways these intercultural

encounters between the Latin West and the Islamic East contributed to the development of Early Renaissance visuality.

CHAPTER SIX

VERRE ÉGLOMISÉ GLASS

As described in chapter 3, fourteenth-century central and northern Italy witnessed a revival of verre églomisé*,* the decorative technique of inscribing imagery into a gilded glass panel.[331] While verre églomisé panels certainly enhanced large, public works like Simone Martini's *Maestà* and Nicola Pisano's Siena Cathedral pulpit with awe-inspiring lighting effects, they also decorated small, private reliquaries. In fact, their use for decorating reliquaries was recommended by Cennino Cennini in his late-fourteenth-century treatise, *The Craftsman's*

[331] This technique goes by many different names, some of which include *vetro dorato*, gold glass, gilded glass, reverse painted glass, *hinterglasmalerei,* and *verre églomisé*. For more on the technique's history, see Silvana Pettenati, *I vetri dorati graffiti e i vetri dipinti* (Turin: Museo Civico d'Arte Antica, 1978), xv-xlviii.

Handbook.[332] This chapter examines the history and fourteenth-century associations of verre églomisé reliquaries by situating some extant reliquaries featuring this technique within prominent trends and practices in fourteenth-century visuality and devotion. It discusses the characteristic features of the reliquaries, posits reasons for the revival of the medium, and suggests how Trecento associations with glass and vision may have shaped the reception of these objects. It then specifically focuses on two case studies, one from the Metropolitan Museum of Art in New York (fig. 6.1) and another from the Walters Art Museum in Baltimore (fig. 6.2). The former example features characteristics shared by a large group of Umbrian reliquaries while the latter example is unique among the surviving works. By looking at these two very different works, this study provides a model of formal analysis that can be applied to a wide range of verre églomisé reliquaries, which, when combined with historical contextualization, can reveal possible reasons for the revival of verre églomisé and its suitability for decorating reliquaries.

The importance of such a study stems from the fact that—although they have not yet been given a substantial place in the canon of Trecento art—verre églomisé reliquaries feature characteristically fourteenth-century traits, making them an ideal lens through which to view this period and its art. They responded to the Trecento's increasing interest in visual culture and visually presented information with their display of relics and their accompanying identification labels, known as authentics. The reliquaries capitalized on the recently developed medium of transparent glass, using it in two different ways simultaneously: clear glass was gilded with gold

[332] Cennino Cennini, *Il libro dell'arte*, ed. Daniel V. Thompson, Jr. (New Haven, CT: Yale University Press, 1933), text on pp. 107-108, translation on pp. 112-114. For Italian text, see Carlo and Gaetano Milanesi, eds., *Il libro dell'arte o trattato della pittura, di Cennino Cennini da Colle Valdelsa; di nuovo pubblicato con molte correzioni e coll'aggiunta di più capitoli tratti dai codici fiorentini* (Florence: Felice Le Monnier, 1859). More will be said about Cennini's description of the technique and his comment on reliquaries later in the chapter.

and thus operated in a similar manner to the works discussed in chapter 3 and, at the same time, other portions of glass were left transparent and functioned in a manner similar to the works discussed in chapter 5. By combining these two approaches in a single work, the verre églomisé reliquaries offered the viewer a theologically complex devotional tool capable of embodying current optical theory and light theology.

These objects serve as informative case studies for an investigation of how fourteenth-century viewers, artists, and patrons conceptualized vision and its role in devotion and the devotional arts. Ultimately such a study demonstrates how well suited the verre églomisé reliquaries were to their time; they simultaneously responded to previous medieval traditions and looked forward to Renaissance ones. Finally, although Trecento art is rarely discussed in terms of a scientific underpinning, this examination suggests that fourteenth-century artists, and their patrons and viewers, harnessed optical theory for devotional purposes.

Modern scholarship has contributed to our technical and contextual understanding of verre églomisé reliquaries, but no scholar has yet conducted a study of these reliquaries' devotional function alongside Trecento visuality. Three other important aspects of scholarship that require further discussion include the long-held but rarely explained Sienese association with this medium, how these reliquaries can contribute to the debate over the impact of the Black Death, and the reasons why so many of the works appear to have been commissioned by Franciscans.

Pietro Toesca laid the foundation for the study of verre églomisé reliquaries over one hundred years ago with his 1908 article in *L'Arte.*[333] About thirty years later, W.B. Honey described the technique and the medium's historical development in a brief article in *The*

[333] Pietro Toesca, "Vetri italiani a oro con graffiti," *L'Arte* 11 (1908): 247-261.

Connoisseur.[334] Around 1940, Emma Zocca and Georg Swarzenski addressed the historical development in more detail and argued, based mostly on stylistic grounds, that there were two main centers of production: one in the north, near Bologna, and one based in and around Umbria and the Marches.[335] Swarzenski and Zocca featured illustrations of a variety of examples from Umbria and the former made important connections between examples to form stylistic families. The latter half of the twentieth century saw a series of more focused case studies and two catalogs of verre églomisé from the Museo Civico in Turin and the Bargello in Florence.[336] In the early 1990s, Dillian Gordon and Irene Hueck addressed the issues of mass production, the hands of individual artists, and the Franciscan patronage of a group of verre églomisé reliquaries from near Assisi.[337] Cristina De Benedictis, currently the leading scholar on Umbrian verre

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[334] W. B. Honey, "Gold-Engraving Under Glass," *The Connoisseur* 92 no. 388 (Dec. 1933): 372-381. For another brief overview of the medium in a later volume of the same journal, see Maria D. Murray, "Reverse-Painted and Gilded Glass through the Ages," *The Connoisseur* 180 no. 725 (July 1972): 201-211. F. Sydney Eden wrote about later examples of verre églomisé in two other articles also found in *The Connoisseur*: "Verre Églomisé," *The Connoisseur* 89 (June 1932): 393-96, and "Verre Églomisé," *The Connoisseur* 92 (Sept. 1933): 180-81.

[335] Emma Zocca, "Vetri umbri dorati e graffiti," *L'Arte* 10 (1939): 174-84; Georg Swarzenski, "The Localization of Medieval Verre Églomisé in the Walters Collection," *Journal of the Walters Art Gallery* 3 (1940): 35-68.

[336] Colin Eisler, "Verre Églomisé and Paolo di Giovanni Fei," *Journal of Glass Studies* 3 (1961): 31-37; William D. Wixom, "Eleven Additions to the Medieval Collection," *The Bulletin of the Cleveland Museum of Art* 66 no. 3 (March-April 1979): 87-151; Dillian Gordon, "A Sienese Verre Églomisé and its Setting," *Burlington Magazine* 123 no. 936 (1979): 148-151; Giovanni Previtali, ed., *Il gotico a Siena: Miniature, pitture, oreficerie, oggetti d'arte* (Firenze: Centro Di, 1982), 246-49; Francesca Cerri, "Le croci reliquiario di Gubbio tecnica e stile," *Paragone Arte* 43 no. 503 (Jan. 1992): 3-11; Liana Castelfranchi, "Due vetri dorati umbri e un affresco de 'Maestro di Fossa,'" *Prospettiva* 91-92 (July-Oct. 1998): 36-40.

[337] Dillian Gordon, "The Mass Production of Franciscan Piety: Another Look at Some Umbrian Verres Églomisés," *Apollo* 140 no. 392 (1994): 33-42; Irene Hueck, "Ein umbrisches Reliquiar im Kunstgewerbemuseum Schloss Kopenick," *Forschungen und Berichte. Staatliche Museen zu Berlin* (1991): 183-8.

églomisé reliquaries, has recently written two important works examining the conditions of their production, format, dating, and authorship.[338]

This chapter contributes an important component to this ongoing discussion by addressing the phenomenon of verre églomisé reliquaries as an artistic trend firmly situated within Trecento visuality, devotion, technology, and optical theory. Such an investigation can also add greatly to our understanding of Trecento Franciscan devotional practices by addressing other unanswered—or unasked—questions about Trecento verre églomisé reliquaries. As mentioned, scholars have noted but not yet explained why verre églomisé objects were commonly designated as "Sienese" in earlier documents.[339] Also lacking is an explanation of the way these objects can inform our understanding of the Black Death's relationship to Trecento art. These devotional artworks were made before, during, and after the plague and produced in a region that experienced great loss due to the plague's effects. Because the production of verre églomisé reliquaries spans the entire fourteenth century, such a study can transcend the traditional approach to Trecento art based on the influence of the Black Death and focus on how artworks reflected the interrelated themes of science, art, and religion within Trecento culture, thus adding yet another dimension to the complex discussion of the relationship between the visual arts and the Black Death.

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[338] Cristina De Benedictis, "Percorso di fra Pietro Teutonico: devozione e artigianato," *Mitteilungen des Kunsthistorischen Institutes in Florenz* 44 (2000): 106-135; idem, *Devozione e produzione artistica in Umbria* (Florence: Edifir, 2010).

[339] As Swarzenski notes in his discussion of Francesco di Vanuccio's double-sided processional image in "Medieval Verre Églomisé in the Walters Collection," 50, "No one knows, however, why in old collections… églomisé objects were labeled with an obstinate predilection as 'Sienese.'"

Cennini on Verre Églomisé Reliquaries

As mentioned above, Cennino Cennini described the technique of verre églomisé in his treatise, *The Craftsman's Handbook.* After his discussion of glass for windows, he describes verre églomisé, as follows:

How to Gild Glass for Reliquary Ornaments

> There is another process for working on glass, indescribably attractive, fine, and unusual, and this is a branch of great piety, for the embellishment of holy reliquaries; and it calls for sure and ready draftsmanship. This process is carried out as follows. Take a piece of white glass, with no green cast, very clean, free from bubbles; and wash it, rubbing it down with lye and charcoal. And rinse it with good clear water, and let it dry by itself. But before you wash it, cut it to the size you want. Then take the white of a fresh egg; beat it with a good clean whisk just as you do that for gilding, so that it is thoroughly beaten; and let it distil overnight. Then take a minever brush, and with this brush wet the back of the glass with this glair; and when it is thoroughly wet all over, take a leaf of the gold, which should be quite heavy gold, that is, dull; put it on the paper tip, and lay it deftly on the glass where you have wet it; and press it down with a little very clean cotton, gently, so that the glair does not get on top of the gold; and lay the whole glass in this way. Let it dry without sun for the space of some days.

Arrangements for Drawing on this Glass

> When it is all dry, get a nice flat little panel, covered with black cloth or silk; and have a little study of your own, where no one will cause you any sort of interruption, and which has just one cloth-covered window; and you will put your table in this window, as if for writing, so arranged that the window shines over your head when you have your face turned toward this window. With your glass laid out on this black cloth:

How to Draw on the Gilded Glass

> Take a needle, fastened in a little stick as if it were a little brush, and have it quite sharp pointed. And, with the name of God, begin to draw lightly with this needle whatever figure you wish to make. And have this first drawing show very little, for it can never be erased; and therefore work lightly until you get your drawing settled; then proceed to work as if you were sketching with a pen, for this work has to be done freehand. And do you want to be convinced that you need to have a light hand, and that it should not be tired?—[Know] that the strongest shadow you can make

> consists in penetrating to the glass with the point of the needle, and no more; that the intermediate shadow consists in not piercing through the gold all over; that it is as delicate as that, and you must not work with haste—rather with great enjoyment and pleasure. And I give you this advice, that the day before the day you want to work at this job, you hold your hand to your neck, or in your bosom, so as to get it all unburdened of blood and weariness.
>
> How to Scrape the Gold Off the Backgrounds
>
> When you have got your drawing finished, and you want to scrape away certain grounds, which generally want to be put in with ultramarine blue in oil, take a leaden style, and rub the gold, which it takes off for you nearby; and work carefully around the outlines of the figure. When you have done this:
>
> How to Back Up the Drawing with Colors
>
> Take various colors ground in oil, such as ultramarine blue, black, verdigris, and lac; and if you want any drapery or lining to glisten [in lines of gold] on green, apply green; if you want it on lac, apply lac; if you want it on black, apply black. But the black is the most striking of all, for it shows up the figures better than any other color.[340]

Though he gives many informative details on the procedure, missing from Cennini's commentary—and contemporary scholarship as a whole—is an explanation of why this technique was suddenly revived in the late-thirteenth century, why it was so appropriate for decorating reliquaries, and who might have commissioned and used them. Nor does Cennini provide further elaboration on why verre églomisé was considered so "indescribably attractive, fine and unusual" and why was it associated with such "great piety." One could certainly posit that the "attractive" and "fine" qualities to which he refers are related to the shimmering, golden highlights of the gilded imagery. With its almost supernatural sparkle, the verre églomisé Crucifixion scene appears at once part mosaic, part metalwork, and part miniature, certainly an

[340] Cennino Cennini, *Il libro dell'arte*, text on pp. 107-108, translation on pp. 112-114. For the text in its original Italian, see Carlo and Gaetano Milanesi, *Il libro dell'arte*, 123-5.

"unusual" trait for the devotional art of this time. The "great piety" associated with verre églomisé is equally difficult to explicate with extant documentation, but may find explanation in its ancient usage.

Although the exact reasons for the resurgence of verre églomisé are not known, the Early Christian verre églomisé found in the Roman catacombs likely inspired its popularity and association with relics in the Trecento. Verre églomisé was originally developed by the ancient Romans, who used it to decorate the bottoms of bowls, cups, and other vessels (fig. 3.17).[341] Upon their owner's death, these gold glass medallions were detached from the functional objects they decorated and impressed into the cement wall of the deceased's tomb in the catacombs. These verre églomisé roundels would have been seen by late-medieval Christians around the same time as the medium was revived because at this time, there was an increase of interest in Roman catacombs. Seen as simultaneously both a response to already occurring pilgrimages and an impetus for more in the future, Pope Boniface's papal bull, the *Antiquorum habet fida relatio*, codified a generous indulgence policy for the Roman Jubilee in 1300 that awarded pilgrims to Rome a spiritual reward similar to that offered to crusaders.[342] Inspired by the promise of salvation, medieval Christians traveled to Rome to pray at, among other sacred sites, the burial grounds of the venerated Early Christian martyrs.

In addition to their association with the holy sites of Rome, the ancient verre églomisé medallions may have also carried the aura of a secondary relic, that is, an object sanctified by physical contact with the remains of a holy figure. Not only did the gold-glass roundels press

[341] For more on the Early Christian use of verre églomisé, see C. Louise Avery, "Early Christian Gold Glass," *The Metropolitan Museum of Art Bulletin* 16 no. 8 (Aug. 1921): 170-175; O.M. Dalton, "The Gilded Glasses of the Catacombs," *Archaeological Journal* 58 (1901): 225-53.

[342] Gary Dickson, "The Crowd at the Feet of Pope Boniface VIII: Pilgrimage, Crusade and the first Roman Jubilee (1300)," *Journal of Medieval History* 25 no. 4 (1999): 280-281.

against the wall containing the remains of the deceased martyr but also, while he or she was still living, the glass would have come into physical contact with the revered early Christian, who used it as a dish or vessel. Considering such conditions, it is not difficult to imagine that an encounter with the gold-glass roundels pressed into the catacomb walls could have inspired the use of verre églomisé in Christian reliquaries.

The Surviving Objects and Their Franciscan Context

There are about sixty pieces of extant verre églomisé;[343] however, because these works were portable and made of fragile glass, one must assume there were many more examples lost to damage over time. The surviving works demonstrate that verre églomisé reliquaries were made in a variety of portable formats, such as diptychs, triptychs, roundels, and processional crosses or panels. As the majority of these objects are too small to serve more than one viewer at a time, they appear to have been for private devotion. To afford a private reliquary one must have either been a wealthy layperson or an established member of a religious order. Most—if not all—of these reliquaries were Italian productions of the Trecento. There are a small number dating to just before 1300[344] and some examples dating to the fifteenth century, but these earlier and later works do not seem to follow the same trends as those dating to the Trecento.

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[343] According to Swarzenski, "Medieval Verre Églomisé in the Walters Collection," 55, there are 60 extant pieces but it is unclear what types of objects are included in this inventory. Cristina De Benedictis includes many examples of Umbrian verre églomisé, but no complete catalog of all types of this medium from all locations exists at this time. In a future project, I will conduct a complete catalog and analysis all the known examples of this important medium in fourteenth-century Italy.

[344] Swarzenski, "Medieval Verre Églomisé in the Walters Collection," 55. For more information on the works dating to the late Duecento see ibid, n. 1.

There is little documentation to aid in attributing these works. Complicating the attempt to more firmly identify the works is the fact that it is unclear whether a group of craftsmen specialized in this field or if artists worked simultaneously in painting and verre églomisé. To understand which role the artist might have played, it is useful to examine what steps Cennini includes in his directions. In his discussion of stained-glass windows, Cennini omits the instructions for making stained glass but includes advice on designing and painting the glass. This would seem to indicate that his reader was not expected to cast the glass, but was designing and painting it. In the next section, when giving his instructions for verre églomisé, Cennini again does not provide details on how to cast the glass panel but he does include directions for every other step of the verre églomisé.

This text seems to suggest that, aside from casting the clear panel of glass, the entire process was done by one person, the artist. Thus, it seems unreasonable to assume that well-known artists such as Lippo Memmi designed the glass and had someone else execute it. Because art historians have traditionally privileged fresco and panel painting above the so-called "minor arts," the tendency has been to assume that a well-known artist like Simone Martini would not have executed the small verre églomisé panels found within his fresco of the *Maestà* in the Palazzo Pubblico of Siena or his panel of St. Louis of Toulouse. Perhaps this assumption is due for reevaluation. With greater sensitivity to the importance of the aesthetic function of glass and verre églomisé, further documentary research may bring more answers to this question.

Within the extant group of verre églomisé reliquaries, a large number of works, almost identical in format, style, and composition, feature Franciscan saints. This group has led scholars to identify them as a family of mass-produced verre églomisé reliquaries dating from the mid-to-

late-fourteenth century produced in Umbria or the Marches.[345] Further evidence of their Franciscan origin stems from the fact that many display strong compositional similarities to the frescoes in San Francesco of Assisi and still exist in Franciscan collections today. Though this art form was not practiced exclusively by the Friars Minor, because of the large number of extant Franciscan objects, one should address why this genre of art was so appealing to the Franciscans.

It is easy to imagine that the verre églomisé reliquaries' relatively inexpensive materials and limited amount of gold leaf would have been appreciated by the fourteenth-century Franciscans. Unlike many of the other religious orders at the time, the friars minor were committed to a vow of poverty.[346] Michael J. P. Robson argues that, because of Francis's lavish upbringing, he was well acquainted with the temptations and problems associated with wealth and found it imperative to integrate a vow of poverty into his order.[347] According to Francis, for one to follow in Christ's footsteps, poverty was essential. In his *Later Rule*, the *Regula bullata*, which served as the basis for the Franciscan lifestyle, Francis emphasized the value of poverty, noting that the brothers may not receive any money, either directly or indirectly: "As payment for their work they may receive whatever is necessary for their own bodily needs and [those of] their brothers, but not money in any form; and they should do this humbly as is fitting for servants of God and followers of most holy poverty."

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[345] Cristina De Benedictis, *Devozione e produzione artistica in umbria* (Florence: Edifir, 2010); Dillian Gordon, "The Mass Production of Franciscan Piety: Another Look at Some Umbrian Verres Églomisés*," Apollo* 140 no. 392 (1994): 33-42; and Irene Hueck, "Ein umbrisches Reliquiar im Kunstgewerbemuseum Schloss Kopenick," *Forschungen und Berichte. Staatliche Museen zu Berlin* (1991): 183-8.

[346] Michael J. P. Robson, ed., *The Cambridge Companion to Francis of Assisi* (Cambridge: Cambridge University Press, 2012), 3-4.

[347] Francis not only understood the potential problems with having wealth but also anticipated its strong temptation and, perhaps for this reason, dictated in his Rule that friars should not even be allowed to touch money. Robson, *The Cambridge Companion to Francis of Assisi*, 6.

For Francis, poverty was important because it brought one closer to the "self-emptying" state of Christ, a state comprised of a combination of humility and love.[348] However, for Francis's later followers, the matter was not so straightforward. The Franciscan commitment to poverty evoked great debate and dissension throughout the thirteenth and fourteenth centuries.[349] Many of Francis's followers, who would come to be known as the spirituals or *fraticelli*, remained deeply committed to his vow of poverty. [350] The majority of the order's leaders, sometimes referred to as "the community," believed that the order needed to adapt to its growing role within medieval society by accumulating wealth in order to finance a more established presence in the major cities of Europe and sustain greater pastoral care of the people.[351] Because of their limited use of gold leaf and otherwise inexpensive materials, the verre églomisé reliquaries could have appropriately honored the sacred relics through modest means.

Further enhancing their Franciscan appeal may have been the prominent use of glass. The fragility of the glass could have resonated with the Franciscans because, in the second

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[348] David Burr, *The Spiritual Franciscans: From Protest to Persecution in the Century after Saint Francis* (University Park: Pennsylvania State University Press, 2001), 2.

[349] For more on this debate, see Burr, *The Spiritual Franciscans*, 261-277 and more recently, idem, "Effects of the Spiritual Franciscan Controversy on the Mendicant Ideal," in *The Origin, Development, and Refinement of Medieval Religious Mendicancies*, ed. Donald S. Prudlo (Leiden: Brill, 2011), 277-305.

[350] Illustrating the complicated nature of such an issue is the fact that even those who were committed to the virtue of poverty experienced problems arising from the order's attitude toward money. The story of John Pecham's rise to archbishop nicely illustrates this situation. Though Pecham was deeply committed to his Franciscan vow of poverty, he nevertheless had to spend a great deal of money to travel to Rome to be mitered and then to travel to his post in Canterbury. This debt had long-lasting negative effects for the archbishop. Burr, *The Spiritual Franciscans*, 7; Decima Douie, *Archbishop Pecham* (Oxford: Clarendon Press, 1952), 49.

[351] For a discussion of the term used to describe the group which opposed the view of the spirituals, see Burr, "Effects of the Spiritual Franciscan Controversy on the Mendicant Ideal," 279.

version of his *Letter to the Faithful*, Francis describes the Incarnation of Christ for his followers as follows:

> Through his angel, Saint Gabriel, the most high Father in heaven announced this Word of the Father—so worthy, so holy and glorious—in the womb of the holy and glorious Virgin Mary, from which he received the flesh of humanity and our frailty. Though He was rich beyond all other things, in this world He, together with the most blessed Virgin, His mother, willed to choose poverty.[352]

The glass panel in the reliquary, so easily broken and destroyed, could have served as a reminder of the transience of this human life for one well versed in Franciscan beliefs.

A Franciscan audience would have also appreciated the subject matter regularly found in the verre églomisé reliquaries. Many of the reliquaries feature the Nativity, Crucifixion, and Annunciation. Because Francis of Assisi received the stigmata, the image of the Crucifixion would have held special significance for Francis's followers. Juxtaposing the Crucifixion with the Nativity and Annunciation emphasized Christ's dual human and divine nature. The theme of Christ's duality was well suited to the object's function as a reliquary since the relics represented both the spiritual and physical nature of the commemorated saint.

The narrative scenes' compositions evoked imagery found in frescoes at the church of San Francesco in Assisi, creating a strong visual connection between these portable devotional devices and the order's headquarters. Also like the Assisi frescoes, the imagery depicted in many verre églomisé panels features the new, naturalistic style so often associated with the artistic trends of the fourteenth century. Figures display naturalistic modeling and there are often hints at a background setting. The relationship between the foreground and background, as well as that among the figures within the scene, seems to closely resemble the style seen in Nicola

[352] Regis J. Armstrong and Ignatius C. Brady, *Francis and Clare: The Complete Works* (New York: Paulist Press, 1982), 66-67.

Pisano's pulpit for the Cathedral of Siena in that they both use hierarchical scale, the figures are not arranged on a consistent ground line but rather "staged up," and both feature classical motifs and foliage patterns. These stylistic similarities may be related to larger, Trecento artistic trends, but it is interesting to consider the formal links between the pulpit and the reliquaries because, as mentioned in chapter 3, the earliest known use of verre églomisé panels is found in Pisano's Sienese pulpit.

As previously mentioned, one of the most important features of the verre églomisé reliquaries was their ability to appropriately celebrate the sacred Christian relics without using copious amounts of gold or sumptuous gems. By manipulating these relatively inexpensive materials in specific ways, the reliquaries could evoke the central Christian belief, namely, Christ's dual human and divine nature. They achieved this goal by displaying their own duality in the composition and treatment of the glass. The imagery in the panels has two clear levels on which it operates. The first of these is the framework of portrait busts at the panel's boarder. These small portraits are confined to small rectilinear compartments at the edge while the central narrative scene is given a more expansive central placement. Rather than small, frontal portraits, this central image features a powerful Christian narrative.

Another way in which the panels operate in two ways simultaneously is by treating the glass in different manners. On the one hand, there are portions of the glass left transparent, which allowed natural light to penetrate to and illuminate the small but precious relics and authentics. On the other hand, portions of the glass have been decorated with verre églomisé, which would have produced glowing golden highlights evocative of God's presence when struck by ambient light. Thus, by using these two different treatments, the reliquaries simultaneously served as both a window to the relics and as a mirror of the divine, a feature that I would argue

made them well suited to Trecento visuality and, by extension, made them very powerful devotion aids.

The Metropolitan Museum of Art's *Reliquary Diptych*:

Looking Through the Glass vs. At the Glass

The Metropolitan Museum's *Reliquary Diptych* (fig. 6.1) is a characteristic example of the group of mass-produced verre églomisé reliquaries from the mid-to late-fourteenth century produced in central Italy for the Franciscan order that feature the newly revived technique.[353] The Metropolitan's reliquary uses the verre églomisé technique to illustrate the Nativity and Crucifixion in the center of each panel and the Angel Gabriel and Virgin Annunciate in the lunette atop each panel. The Nativity is surrounded by symbols of the four evangelists and two unidentified saints while portraits of Saints Peter, Paul, Francis, and Clare, along with two other unidentified saints, frame the Crucifixion. Interspersed between the saints' portraits in the borders are a series of rectangular fields without gilded imagery.[354] These small relic-windows reveal a variety of relic fragments with their authentics, displaying such relics as that of Mary Magdalene and the True Cross.

Initially, the different treatments of glass within the reliquary—that decorated with verre églomisé and that left transparent—seem to be at aesthetic odds with one another, but after contextualizing the visual experiences offered by each treatment within contemporary optics and

[353] For a list of other reliquaries of a similar type, see Gordon, "The Mass Production of Franciscan Piety," 33-42.

[354] The unidentified saint in the center of the left border is a male figure holding the martyr's palm and the one in the center of the right panel is female, potentially St. Veronica holding the sudarium.

devotional practice, a potential resolution for these different approaches becomes more clear. As described previously in conjunction with works such as Naddo Ceccarelli's *Reliquary Tabernacle with Virgin and Child* (chapter 5), the portions of the reliquary's glass that are left transparent compelled the viewer to look *through* the glass's surface to the relic fragments of wood, cloth, and hair. Because of the small size of the relics, the Trecento viewer needed to get close, perhaps even strain one's sight, in order to see the relics. Such intense gazing likely lent the process of viewing the panel a very intimate tone. The devotee's reliance on vision was further strengthened because, in order to obtain validation of the relics, they needed to be literate and read the visually presented text contained in the authentic. In a general way, this type of spiritual devotion, so dependent on one's physical sense of sight, may be categorized as an empirical viewing experience, a harbinger of the growing interest in scientific investigation and, by extension, Renaissance values.[355] Viewing the relics in this manner allowed the viewers to use their human eyes to see, or to know, the human side of Christ and the saints by engaging with evidence of their material form as a means of contemplating the divine. Fourteenth-century viewers could have established a powerful connection to their spiritual role models, and ultimately Christ, based on examining evidence of their shared human experience.

In a manner very different from the transparent portions of glass, the areas of the reliquary's glass decorated with verre églomisé depict canonical Christian narratives and

[355] This discussion stems from Paul Hills's discussion of the shift from an interest in materiality and what he calls "surface light," to a more naturalistic style and lighting that illuminates the scene, which he defines as "pictorial light." Paul Hills, *The Light of Early Italian Painting* (New Haven, CT: Yale University Press, 1987), 3-28. The visual display of relics was not commonplace in medieval reliquaries. When describing the *Reliquary of the Staff of St. Peter* on p. 287, Hahn notes, "Typical of reliquaries made in the western medieval world, this golden staff holds its relic tightly and invisibly, inaccessible to either devout or skeptical eyes." Cynthia Hahn, "What do Reliquaries Do for Relics?" *Numen* 57 no. 3/4 (2010): 284-316.

emphasize the surface of the glass panel. When viewing the golden reflections bouncing off the gilded imagery, one would have been witness to sharp, bright reflections of light. As discussed in chapter 3, Paul Hills suggests that such an experience could have been interpreted as a powerful connection between the viewer and the holy image because, at this time, light and spiritual enlightenment were commonly associated with one another.[356] Such gilded imagery could have reminded the Trecento viewer of the more traditional medieval reliquaries which typically concealed relics behind an array of precious materials, particularly gold, in order to evoke the precious nature of the divine.[357] Using their inner mind's eye, or their spiritual insight, the Trecento faithful could reflect on the divine nature of God in a more abstract way. Thus, the transparent glass provided Trecento viewers with an opportunity to use their sensory perception to examine physical evidence of the saints' human nature while, at the same time, the golden highlights had the potential to abstractly symbolize the divine.

By treating the glass in these divergent manners, the artist offered the viewer two dramatically different, but equally valid, visual experiences capable of inspiring spiritual insight: one through reflection on Christ's humanity and the other, on his divinity. Presented with these

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[356] In his discussion of the gilded panel's highlights in relation to Trecento light and optics, Paul Hills notes, "the lustre moving over the surface…could be experienced as a personal link between the worshipper's eyes and the sacred image…the light of Christ's brightness could literally shine upon the eyes; and this physical light entering the eyes would have been intuitively understood as metaphor for spiritual illumination." Hills, *The Light of Early Italian Painting*, 18.

[357] The description of heaven from Revelations 21 describing Heavenly Jerusalem as a city of gold covered in gems and jewels was well known in the Trecento. The association between gold and the divine was further strengthened after the influx of Byzantine icons into Italy in the thirteenth century, which inspired early modern Italy's assimilation of the characteristically Byzantine gilded panels and chrysography. Hills, *The Light of Early Italian Painting*, 25. Gold was even enlisted to work miracles; the early modern physician Gentile da Foligno prescribed a beverage with gold emulsion as a remedy for the plague. This instance is recounted in Millard Meiss, *Painting in Florence and Siena After the Black Death: The Arts, Religion and Society in the Mid-Fourteenth Century* (New York: Harper and Row, 1951), 75 n. 5.

opposing decorative treatments, one wonders if the Trecento viewer struggled to reconcile them or privilege one over the other. If early the principles behind early modern Christian doctrine can serve as a model, it would follow that Trecento viewer did not expect cohesion and may have even appreciated the paradoxical approach when contemplating spiritual matters. After all, the reliquary's primary function was to commemorate the relics, the physical evidence of the human nature of Christ and his saints. At the same time, it needed to appropriately celebrate the corresponding celestial spirit. By fusing the two different decorative treatments within a single sheet of glass, the reliquary could have elegantly evoked the central mystery of the Christian faith: the nature of Christ as both fully human and fully divine. In so doing, it referenced the medieval tradition's penchant for a more abstract approach to the divine with the golden highlights as well as a more empirical approach indicative of burgeoning Renaissance tradition.

It is possible to find further correlations between the different treatment of the glass and the two main visual theories of the day—intromission and extramission—as well as with the early modern anatomical understanding of the eye. As noted in chapter 3, the Platonic model of visual theory, known as extramission, permeated Western European thought from the fourth century through the end of the thirteenth century. Plato theorized that the eye sent out visual beams that coalesced with external light and reached out to the object, resulting in visual perception.[358] Thus, when praying to a reliquary, Trecento viewers sympathetic to Plato's visual theory would have been able to conceive of the dramatic golden reflections as more than just indications of the holiness of the reliquary. These sharp rays of light bouncing off the glass could have been understood as visual manifestations of Plato's fiery rays emitted from the eye,

[358] David C. Lindberg, *Theories of Vision from al-Kindi to Kepler* (Chicago: University of Chicago Press, 1976), 5: "Visual fire emanates from the eye and coalesces with its like, daylight, to form 'a single homogeneous body' stretching from the eye to the visible object: this body is the instrument of the visual power for reaching into the space before the eye."

hitting their object of perception, and returning to the viewer with the input. In this context, the reliquary's gilding offered visual verification of the moment of contact between the viewer and the reliquary, ensuring a solid foundation for one's devotional practice. That Plato's visual theory resonated with the golden highlights from the verre églomisé portions of glass rather than the transparent glass is fitting because Plato's philosophical outlook was more interested in abstract concepts rather than the observable.

If, however, instead of God's divine nature one desired to reflect on the humanity of Christ and the saints, the viewer could have reflected on the emerging philosophy and visual theory of Aristotle rather than that of Plato while praying to the reliquary.[359] Aristotle's visual theory superseded that of Plato by the beginning of the fourteenth century after its reintroduction to the Latin West through Muslim and ancient Greek optical treatises.[360] Aristotle combined certain aspects of Plato's extramission with its main theoretical opponent, intromission, which maintained that the perceived object sent forth images of itself, known as *eidola,* into the eye. In order to reconcile these two seemingly opposed systems, Aristotle developed what David Lindberg has termed the "mediumistic" visual theory. [361]

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[359] As Paul Hills notes, "In Christian Europe before the late twelfth century it would not have been considered spiritually rewarding to pay close attention to the physics of light or to the physiology of human vision. True knowledge, it was believed, following what was originally a Platonic doctrine, could not be gained from the senses, because they were by nature fallible and because the objects of sensory perception, belonging to the material world, were but dim reflections of reality. To perceive the eternal reality, which lay behind the accidental and changing aspects of the world of matter, required the gift of intuition – a contemplation, or 'looking into', which sees beyond appearances." Hills, *The Light of Early Italian Painting*, 12-13.

[360] Hayden Maginnis, *The World of the Early Sienese Painter* (University Park, PA: Pennsylvania State Press, 2001), 2; David Lindberg, *Studies in the History of Medieval Optics* (London: Variorum Reprints, 1983), 349-350.

[361] Lindberg, *Theories of Vision*, 6-9.

Aristotelian theory asserted that the perceived object sent forth *eidola*, or images of itself, into the intervening medium, usually air, and it was through this medium that the visual properties were absorbed and processed by the eye. Lindberg describes Aristotle's position as one not focused on directional rays from the object or eye, but rather one that paid more attention "toward the medium between the observer and the visible object."[362] As Lindberg describes it, Aristotle "perceives the absolute necessity of this medium… [which is] diaphanous or transparent, a nature or power found in all bodies, but especially air, water, and certain solid substances."[363] For Aristotle's theory, then, which was ascendant at the time of the fabrication of the Metropolitan's *Reliquary Diptych* and similar verre églomisé reliquaries, a great deal of emphasis and importance was placed on the space between the viewer's eye and the observed object. And, for visual contact to be made, this medium needed to be transparent.

While I am not aware that either Aristotle or Lindberg entertained transparent glass as a suitable "solid substance," it is worth considering that the portions of clear glass set before the relics in the *Reliquary Diptych* certainly could have met the necessary requirements. Viewing the verre églomisé reliquary with an Aristotelian model of vision in mind, a fourteenth-century observer could have interpreted the transparent glass panel as a stable, physical manifestation of the visual process, reaffirming the point of contact between the relic and the Trecento viewer.

The ability of the Metropolitan's *Reliquary Diptych* to resonate simultaneously with both the Aristotelian and Platonic modes of vision is, again, not a conceptual weakness, but constitutes a fitting reflection of a historical context in which both theoretical models were available and possible. Though there was a general shift from the Platonic to the Aristotelian

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[362] Ibid., 7.

[363] Ibid.

model, the debate between these two models continued from the time of the medieval scholastics until Johannes Kepler. Thus, throughout the fourteenth century, Plato's theory was still an option, for it was regarded as a theory valid enough to dispute.[364]

When contextualizing these visual theories within the sphere of devotional art and the verre églomisé reliquaries, it is important to note that visual theories were not purely scientific pursuits but rather were considered a means to an end, specifically a spiritual end. Devotional effectiveness superseded optical debate and purely scientific goals. Furthermore, the private nature of prayer afforded the viewer the opportunity to employ whichever theoretical model or models served the ultimate goal of bringing one closer to God. Even if the viewer had exposure to optical theories—which would have at least been somewhat likely if the viewer was an educated member of the Franciscan order, as will be further discussed below—the devotee using the reliquary would not have been primarily concerned with the specifics of the theoretical models while deep in prayer. Rather, when faced with the potential of spiritual enlightenment, the Trecento devotee would have employed any and all methods at his or her disposal to affect spiritual insight.[365]

[364] Ibid., 122-132.

[365] For an excellent overview of the wide range of cultural perceptions of sight and a corresponding bibliography see Cynthia Hahn, "Vision," in *A Companion to Medieval Art: Romanesque and Gothic in Northern Europe*, ed. Conrad Rudolph (Oxford: Blackwell Publishing, 2006), 44-64.

Vision, Visuality, and Verre Églomisé Reliquaries

As mentioned in chapter 4, there was another aspect of optical science that could have resonated with the viewer's experience of the transparent glass relic-windows, namely, the anatomy of the eye. The ancient scholar who codified much of the early modern understanding of the eye's anatomy was Galen; however, the Latin West obtained most of its information on the eye's structure from Hunain's *Ten Treatises on the Eye.*[366] Hunain described the lens of the eye as an ice-like or crystal-like humor, which is uncolored, transparent, luminous, and round with a flattened face.[367] Its transparent nature, he noted, allowed it to quickly receive the color of perceived objects, its round shape prevented breaking or chipping, and its flatness provided a nice surface on which to receive visual stimuli.[368] As the seat of vision, the crystalline humor occupied the central position in the eye so that it could be served by the other elements.[369]

After the crystal-like humor, the next most important supportive membrane was the one located directly behind the lens. This element was described as the vitreous humor, that is, having a "glass-like" nature. Although the "glass-like" substance within the eye was not considered the exact location where vision occurred, it was crucial for fostering the visual process. The vitreous membrane served the crystalline humor by mediating between the seat of vision and the blood vessels of the retina. Because, as Hunain explained, "A substance is most quickly transmitted into the thing which resembles its own nature most closely," the glasslike

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[366] Hunain's description of the anatomy of the eye was extremely influential for both Islamic and Italian understanding of the nature of the eye. Lindberg, *Theories of Vision*, 34-41.

[367] Ibid.

[368] Hunain, *The Book of the Ten Treatises on the Eye,* trans. Max Meyerhof (Cairo: Government Press, 1928), 3.

[369] Lindberg, *Theories of Vision*, 34.

substance was ideally suited to serve the crystalline seat of vision.[370] Just as glass was similar to but not identical to the properties of crystal, the corresponding elements within the eye were similar enough that the glasslike component could transmit the visual information to the locus of vision.

Such an association with the eye's "glasslike" component could have easily resonated with the glass panels of the reliquaries. As the faithful gazed at the relics through the glass, they could imagine that the glass panel fostered a form of visual contact. The idea that vision was a form of contact had been promoted by Alexander of Hales: in the thirteenth-century debate over the benefits of viewing the Elevation of the Host, he argued that visual contact was sufficient to receive the Host's virtues. He explained that because the host bestowed spiritual, immaterial benefits, the sense of sight was the most appropriate sense organ with which to receive them, as it was the most immaterial of the five senses.[371] The belief that, by viewing these relics, contact was made would have been especially helpful to one viewing the small fragments within the verre églomisé reliquaries.

While it is difficult to ascertain the extent of critical engagement among Trecento viewers with the aforementioned optical theories about the nature of the visual process or the structure of the eye's anatomy due to a lack of contemporaneous documentation, the Franciscans were some of the most interested among the religious orders at the time in studying and capitalizing on an understanding of optics for their devotional pursuits. The Franciscan order, the likely patrons and viewers of many of the verre églomisé reliquaries, had a strong penchant for visual media

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[370] Hunain, *The Book of the Ten Treatises on the Eye*, 6.

[371] Roland Recht, *Believing and Seeing: The Art of Gothic Cathedrals,* trans. Mary Whittall (Chicago: University of Chicago Press, 2008), 71.

and optics.[372] Not only did Franciscans commission many of the most famous works of visual art of the early modern period but also several members of the order made important contributions to the science of optics and many others referenced optical theory in their theological writings. Alexander of Hales was a Franciscan as were many of the most influential theorists of thirteenth-century optics, including Roger Bacon, John Pecham, John Duns Scott, and William Ockham.[373] Another famous Franciscan to write extensively about both branches of optics, that is, both sight and light, was St. Bonaventure. In the mid-thirteenth century, St. Francis's official biographer expressed a characteristically Franciscan position when he noted, "Behold how the Divine Wisdom lies hidden in sense perception, and how wonderful is the contemplation of the five spiritual senses in the light of their conformity to the senses of the body."[374]

The Franciscan emphasis on the visual finds particular support in some of the order's most famous works of literature and visual art. *The Meditations on the Life of Christ,* written around 1300, was a text devised by a Franciscan friar and addressed to a nun of the Poor Clares

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[372] For more on the Franciscan use of images in devotional practice, see Anne Derbes, *Picturing the Passion in Late Medieval Italy: Narrative Painting, Franciscan Ideologies, and the Levant* (New York: Cambridge University Press, 1996). For a discussion of how Franciscans relied more heavily on sensory experience and the Dominicans on logic, see David L. Jeffrey, "Franciscan Spirituality and the Growth of Vernacular Culture," in his *By Things Seen: Reference and Recognition in Medieval Thought* (Ottawa: University of Ottawa Press, 1979), 150-151.

[373] Roger Bacon and John Pecham both joined the Franciscan order around 1250 in Oxford: David C. Lindberg, "Lines of Influence in Thirteenth-Century Optics: Bacon, Witelo, and Pecham," *Speculum* 46 no. 1 (Jan 1971): 67. For more on John Duns Scotus, see Katherine H. Tachau, *Vision and Certitude in the Age of Ockham: Optics, Epistemology and the Foundations of Semantics, 1250-1345* (Leiden: E.J. Brill, 1988), 55.

[374] Emma Therese Healy, ed. and trans., *Reductione artium ad theologiam*, 2nd ed. (New York: Franciscan Institute, 1955), 51. For Ockham, see ibid., 113.

in an attempt to help her with her devotional practice. It vividly described biblical events and implicated the reader as a witness by invoking a rich sensory experience with the goal of inspiring the reader to envision the events in one's mind's eye.[375] Further evidence of the Franciscan privileging of visual media is found in the extensive artistic program at San Francesco in Assisi, which not only used the naturalistic style to mimic the natural world, but also incorporated many references to optical devices throughout its walls.

In the decades preceding the production of the gold-glass reliquaries, the Franciscans at Assisi commissioned many artworks incorporating actual glass or depictions of optical devices made of glass, making it likely that at least some of the Franciscan patrons and viewers of the verre églomisé reliquaries had exposure to optical theory and technology. As described in more detail in chapter 5, optical instruments and glass can be found throughout the decorations in the Lower Church of San Francesco in Assisi. For instance, to convey the powerful insight of Prudence, Giotto painted her holding a mirror.[376] Approximately 30 years later, Andrea de' Bartoli da Bologna painted one philosopher holding a pair of eyeglasses and another holding a

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[375] In a similar way, the detailed description of Francis's physical appearance recorded by Thomas of Celano and the portrait of Francis in the Lower Church at San Francesco in Assisi, made to Celano's specifications, preserved the physical appearance of Francis so that a follower could conjure up a mental image of their founder at any time. "He was of middle height, inclining to shortness; his head was of moderate size and round; his face somewhat long and prominent, his forehead smooth and small; his eyes were black, of moderate size, and with a candid look; his hair was dark, his eyebrows straight; his nose symmetrical, thin, and straight: his ears upright, but small; his temples smooth…His teeth were set close together, white and even; his lips thin and fine, his beard black and rather scanty, his neck slender; his shoulders straight, his arms short, his hands attenuated, with long fingers and nails; his legs slight, his feet small, his skin fine, and his flesh very spare." Thomas of Celano, *Vita prima,* 83; trans. A.G. Ferrers Howell, *The Life of St. Francis by Thomas de Celano* (London: Methuen, 1908), 81; quoted in Hills, *The Light of Early Italian Painting*, 12.

[376] Found in the *Allegory of Obedience* in the Lower Church of San Francesco at Assisi and dated to around 1330. For more on this see, Herbert L. Kessler, "Speculum," *Speculum* 86 no. 1 (Jan. 2011): 1-41.

magnifying glass in his scene of *The Philosophers Confronting St. Catherine* in the burial chapel of Cardinal Albornoz. In addition to these illustrations of glass objects, an abundance of actual mirrors, in the form of convex glass backed with silver, covers the ceiling of the Lower Church, simulating stars against a dark blue sky.[377]

Along with their interest in the sense of sight, Franciscans studied the nature and theology of its optical counterpart, light. St. Bonaventure wrote extensively about the theoretical implications of light in his commentary on the *Sentences* of Peter Lombard. Following in the tradition started by Augustine, Bonaventure conceptualized light as having three different modes: *lux*, *lumen*, and *color*.[378] He distinguished the three as follows: "*Lux* can be considered as threefold, that is in itself, and in transparent media, and as terminated at the limits of the perspicuous: in the first mode it is *lux*, in the second *lumen*, in the third the hypostasis of color."[379] In other words, *lux* is the essential nature and original source of light, *lumen* is the radiance that stems from this source, and *color* is the effect produced when light falls onto solid objects.[380]

Comparing Bonaventure's description to the formal characteristics of the Metropolitan Museum's *Reliquary Diptych* reveals interesting connections between the different aspects of light and the visual experience of the verre églomisé reliquaries. As the essential nature and source of light, *lux* was comparable to God in a spiritual analogy and a flame or the sun in a

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[377] Hayden Maginnis, "Assisi Revisited: Notes on Recent Observations," *The Burlington Magazine* 117 no. 869 (Aug. 1975): 512.

[378] Arthur Zajonc, *Catching the Light: The Entwined History of Light and Mind* (Oxford: Oxford University Press, 1993), 97-98; Edward Grant, ed., *A Source Book in Medieval Science* (Cambridge, MA: Harvard University Press, 1974), 383.

[379] Bonaventure I. sent., d.17, p.1; quoted in Hills, *The Light of Early Italian Painting*, 11.

[380] Hills, *The Light of Early Italian Painting*, 11.

more practical corollary. Bonaventure referred to God as the "Father of Lights" in his prologue to *The Soul's Journey into God,* noting, "In the beginning I call upon the First Beginning, from whom all illuminations descend as from the Father of Lights, from whom comes every perfect gift."[381] Evoking a more practical analogy, John Pecham, a thirteenth-century Franciscan natural scientist known for his work on optics, equated *lux* to a candle flame.[382]

Lumen, the emanation of *lux*, was most commonly observed as the aura of light radiating out from a candle flame or as the rays of the sun. In terms of a symbolic interpretation, *lumen* could have been associated with Christ because he was seen as the ultimate emanation from God and the vehicle by which God's light entered the world. This analogy is corroborated by Bonaventure's description of Christ's relationship to God in his *Tree of Life,* "In this eternal kingdom, all good and perfect gifts come down in plenty and abundance from the Father of Lights (James 1:17) through Jesus Christ, who is the superessential Ray…For he is a pure effusion of the brightness of the power of the omnipotent God."[383]

According to Bonaventure, *color* was light resting on a solid, opaque object after making its way through a transparent medium such as air or clear glass. *Color*, in this sense, was the entity that made manifest the visual qualities of physical objects. One's experience of the natural world, and—as Bonaventure preached—the way in which it reflects God's goodness, depended on the presence of light as *color*. As with *lux* and *lumen*, *color* also finds a visual parallel

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[381] Bonaventure, "The Soul's Journey into God," in *Bonaventure: The Soul's Journey into God, The Tree of Life, The Life of St. Francis*, ed. Ewert Cousins (New York: Paulist Press, 1978), 53.

[382] Hills, *The Light of Early Italian Painting,* 11.

[383] Bonaventure, "The Tree of Life," 170-171. For an interpretation of the emanation of light as the divine Logos see Hills, *The Light of Early Italian Painting,* 14. While Hills's interpretation is logical and grounded in early modern optics, I argue in favor of a more specifically Franciscan source and interpretation when looking at a Franciscan reliquary.

operating in the *Reliquary Diptych* and similar verre églomisé reliquaries. The candle's *lux* emanated through the air and glass as *lumen,* and, as *color,* it made visible the relics' shape, texture, and other physical qualities. The saints represented by these relics were likewise examples of God's divine nature reflected in the mundane world. Theoretically, the presence of *color* in the world enabled one to appreciate God through his creation. Within the specific context of the *Reliquary Diptych*, *color* enabled one to view evidence of this phenomenon in its highest form through the presences of the relics.[384]

While many informative connections between theology and light can be found within the reliquaries, Bonaventure's system lacks a visual counterpart to the golden, sparkling reflections discussed earlier and in chapter 3. As if in response to this very issue, another Franciscan writing in the late thirteenth century, Bartolomeo da Bologna, added a fourth type of light to Bonaventure's system: *splendor*.[385] Bartolomeo observed that "when rays emanating from a luminous body reach another body that is smooth, polished and shining, such as a sword or gilded panel (*tabulam deauratam*), and rebound back from that body this is called *splendor*. And by such reflections on a polished and shining body the light (*lumen*) in space is multiplied and such multiplication of light is properly called *splendor*."[386]

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[384] For a similar description of Bonaventure's description of *color,* and the other qualities of light, see Umberto Eco, *Art and Beauty in the Middle Ages* (New Haven, CT: Yale University Press, 1985), 50.

[385] Hills, *The Light of Early Italian Painting*, 11. For more on Bartolomeo da Bologna (sometimes written Bartolomeo di Bartoli da Bologna, Bartholomew of Bologna, or Bartholomaei de Bononia), see Graziella Federici-Vescovini, *Le teorie della luce e della visione ottica dal IX al XV secolo: Studi sulla prospettiva medievale e altri saggi* (Perugia: Morlacchi Editore, 2003), 29-33.

[386] I. Squadrani, "Tractatus de luce fr. Bartholomaei de Bononia," *Antonianum* 7 (1932): 230-231; quoted in Hills, *The Light of Early Italian Painting*, 11.

The reliquary's highlights were a compelling part of its visual experience because they created a powerful connection with the viewer and perhaps embodied the fiery rays of the Platonic system. To clarify the nature of *splendor* versus *color,* one should note that while *color* is light striking an opaque body, *splendor* is light falling on a luminous one. Therefore, although both *color* and *splendor* are reflections, the former illuminated the relics while the latter illuminated gilded portions of the verre églomisé. When light reflected off the gilded glass panel, which had similar qualities to the *tabulam deauratam* described by Bartolomeo, reflections obscured one's view of the glass's surface and the gold leaf. Unlike *color,* which fell on the transparent glass and enabled one to study the physicality of the relics, the *splendor* negated the physical characteristics of the panel. In so doing, light as *splendor* became an almost supernatural quality, making it a particularly suitable symbol for God's divinity.[387]

Therefore, while *color* may have represented the divine as experienced through the natural, observable world, *splendor* could have reflected the presence of God in more supernatural, unobservable forms such as in the case of miracles or visions. In the case of both a miraculous encounter and *splendor,* the essence of the divine was appropriately out of reach. Although it was the focus of much study and contemplation, a human encounter with the divine was inherently elusive because true knowledge of God had to wait until one's afterlife.

A specific and powerful example of all this symbolism is the Trecento doctrine of the Beatific Vision. The *visio Dei* was the moment after death when one came into visual contact with the divine. As famously described by St. Paul in 1 Corinthians 13:12, "For now we see through a glass, darkly; but then face to face: now I know in part; but then shall I know even as

[387] A similar interpretation of light reflecting off gold as seen in the medieval tradition can be found in what Paul Hills describes as surface light. Hills, *The Light of Early Italian Painting*, 3-28.

also I am known."[388] While the message seems straightforward—while living an earthly existence one's knowledge of God is imperfect and perfect knowledge is only possible in heaven—around the 1330s, church leaders, especially the Franciscans, intensely debated exactly when this experience of mystical union occurred.[389] Some friars followed the 1330 position of Pope John XXII and believed that it happened after the Last Judgment, meaning that there was a waiting period between one's individual death and the Last Judgment. The opposing view, that promoted by Pope Benedict XII's *Benedictus Deus,* mandated that individuals, if properly cleansed of their sins in purgatory, could indeed experience the *visio Dei* after their individual death but before the end of time. [390]

Further complicating one's understanding of Paul's comment is the fact that the translation has been interpreted in various ways. Edward Peter Nolan's essay in his *Now Through a Glass Darkly: Specular Images of Being and Knowing from Virgil to Chaucer,* works to clarify the debate.[391] Nolan describes some of the translations as "through a glass darkly," "in a mirror dimly," and "puzzling reflections in a mirror" and argues that, if translated literally, it is likely more correct that Paul's passage refers to a mirror rather than a sheet of glass. However,

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[388] Other translations of the first portion include the Revised Standard Version's "Now we see in a mirror dimly" or the New English Bible's "Now we see puzzling reflections in a mirror." For a discussion and analysis of the various translations, see Edward Peter Nolan, "Introduction: The Cracked Looking Glass," in his *Now Through a Glass Darkly: Specular Images of Being and Knowing from Virgil to Chaucer* (Ann Arbor: University of Michigan Press, 1990): 1-13.

[389] Bernard McGinn, *"Visio dei:* Seeing God in Medieval Theology and Mysticism," in *Envisaging Heaven in the Middle Ages,* eds. Carolyn Muessing and Ad Putter (New York: Routledge, 2007), 16; Decima Douie, "John XXII and the Beatific Vision," *Dominican Studies* 3 no. 2 (1950): 154-74.

[390] Caroline Walker Bynum, *The Resurrection of the Body in Western Christianity 200-1336* (New York: Columbia University Press, 1995), 283-291.

[391] Nolan, *Now Through a Glass Darkly,* 1-13.

Nolan also points out that many translators have opted to use the word glass instead for its lyrical beauty and because it may in fact bring the reader closer to Paul's original meaning. Basing his analysis on the Latin translation—as this was the source of the medieval commentaries—Nolan deconstructs the passage, particularly its prepositions. He concludes that there is no precise or absolute translation possible and that therefore, the passage holds several interpretations simultaneously. Rather than seeing this as a mistake or problem of some sort, Nolan argues that this is very fitting for a passage which tries to explain a mystery when he writes "that the utterance written to clarify an enigma is itself an enigma."[392]

It is worth considering the verre églomisé reliquaries within the context of St. Paul's comment on the Beatific Vision context because, as previously mentioned, it was commonly believed that physical vision reflected its spiritual counterpart and because St. Paul specifically equated the human experience of God to viewing him through a piece of glass or reflected in a mirror, depending on the translation. I would argue that it is not a coincidence that the reliquaries with verre églomisé combined with transparent glass are able to offer visual correlaries to either the translation as glass or mirror.

When reflecting on the concept of the Beatific Vision using a work such as the Metropolitan Museum's reliquary, a Trecento viewer would have understood that any real understanding of God could not be perfect while still inhabiting the earthly realm. This is not to imply that the impossible nature of the exercise was discouraging. On the contrary, such a devotional tool was uniquely suited to the task at hand. Just as the viewer's spiritual relationship with their God was constantly evolving, so was the meditative aid before them.

[392] Ibid., 2.

The reliquary offered many different options: one could have focused on glass as mirror or window. By employing a more Aristotelian outlook, the viewer could carefully examine physical evidence that saints such as St. Francis—their spiritual model, their order's founder, and their Umbrian compatriot—once walked this earth just as they did and now resided in heaven with God. At the same time, the verre églomisé scenes confirmed that some relationship with God, either through a miraculous vision or angelic messenger, however ambiguous or abstract, was also possible while still living. By approaching the golden highlights and complex narratives with a more Platonic mindset, the early modern Christian could reflect on the fact that God's light, though indefinable and elusive, did have a place in the natural world.

Thus, by invoking a combination of earthly senses and spiritual insight, the *Reliquary Panel* and other verre églomisé reliquaries offered a complex yet elegant visual aid for understanding the Beatific Vision by juxtaposing the relics behind the glass with the symbolic golden highlights reflecting off the gilded glass. For the reliquary to achieve this goal, the artist employed diverse methods. Fittingly for such a multivalent devotional tool, the artist of the *Reliquary Diptych* used a single sheet of transparent glass as both a window to relics and a mirror of the divine, in order to inspire faith and transcendental insights into the promise of the Beatific Vision and direct knowledge of God.

Tommaso da Modena's Reliquary Panel: Sketching the Divine

Another example of a reliquary using the verre églomisé technique that seems to draw on an optical understanding for reaching spiritual ends is the panel, originally part of a diptych or triptych, executed largely by Tommaso da Modena, now in the Walters Art Museum in

Baltimore (fig. 6.2). What follows contextualizes this reliquary panel within concurrent optical technology, Christian theology, and Franciscan devotional practice. In so doing, it demonstrates the potential ways this decorative technique could have resonated with Trecento viewers and situates the complex viewing experience offered by Tommaso's panel within Trecento visuality.

The 18-inch-high wooden panel from around 1360 features a variety of media; naturalistically painted portraits of saints and symbols of the Evangelists along with insets of marble and ceramic line the panel's outermost boarder.[393] The tabernacle is surmounted by a piece of verre églomisé at the pinnacle featuring the Virgin Annunciate in gold leaf with black backing (fig. 6.3).[394] At the center of the work is another panel of verre églomisé depicting the Crucifixion etched into gold leaf and backed with black pigment (fig. 6.4). This scene is surrounded by a series of saints inscribed into gold leaf and backed with red or green pigment.[395] Interspersed between the saints are portions of the glass panel that have been left blank. These areas of transparent glass reveal a group of small relic fragments and their authentics, displayed behind the glass panel.[396] While Tommaso is credited with the paintings and the overall artistic

[393] The painted saints include Francis and Michael in full-length view and Anthony Abbot, Anthony of Padua, and Cosmas and Damian, according to Robert Gibbs, *Tomaso da Modena: Painting in Emilia and the March of Treviso, 1340-80* (Cambridge: Cambridge University Press, 1989), 296.

[394] The fact that the Virgin Annunciate is shown without the Angel Gabriel is just one of the compelling reasons many scholars have assumed this panel was one side of a diptych.

[395] The saints in the glass panel include: Peter, Paul, Louis of Toulouse, John the Evangelist (?), Stephen, and Lawrence (?), according to Gibbs, *Tomaso da Modena,* 296.

[396] The panel contains relics of Sts. Andrew, Luke, Peter and Paul on the left side, the Holy Cross and the Holy Sepulcher at the top, the 11,000 Virgin Martyrs and one of the Three Kings on the right side, and St. James on the bottom, according to Martina Bagnoli and others, eds., *Treasures of Heaven: Saints, Relics, and Devotion in Medieval Europe* (New Haven, CT: Yale University Press, 2010), 203. The authentics are transcribed as follows: "de lingio sancte crucis / de lapide

direction, the gilded glass panels likely belonged to the aforementioned family of gilded glass, came pre-made, and were integrated into the piece by the artist. As will be discussed, as in the case of the Metropolitan's *Reliquary Diptych*, the emphasis on viewing the relics directly, the associations between transparent glass and optical technology, and the unique lighting effects created by the panel reflected characteristic features of Trecento visuality in significant ways.

Documentary evidence affirms that the Florentine public was well aware of visual aids made from glass by the early fourteenth century. As noted in chapter 5, in his Lenten sermon of 1305, Fra Giordano described the recently invented eyeglasses to the crowd.[397] That news of the invention of eyeglasses was spread through a sermon to the Florentine public indicates that both the clergy and the general populace were aware of optical aids made of transparent glass and how these devices could impact their visual experience in a very practical way. Taking this knowledge into account, it is likely that the patrons of the verre églomisé reliquaries were familiar with the development of optical aids made from glass and other innovations in optical technology, as the panels were made several decades after the sermon. There is no doubt that the artist, Tommaso, was well aware of eyeglasses and similar visual aids. About a decade prior to his reliquary panel, he painted a series of famous Dominicans in the monastery at San Nicolò in Treviso featuring a portrait of Cardinal Hugh of St. Cher with eyeglasses, Cardinal Nicholas of Rouen with a magnifying glass, and Pietro Isnardo da Chiampo of Vicenza with a reading mirror.[398] For the same patrons, Tommaso painted a portrait of St. Jerome in the adjacent church

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sepulcri; de ossibus sancti andree apostoli et luce evangeliste / de ossibus xi. milia virginium / de ossibus unius magorum; de ossibus Jacobi apostoli R." Gibbs, *Tomaso da Modena*, 296.

[397] Vincent Ilardi, *Renaissance Vision from Spectacles to Telescopes* (Philadelphia: American Philosophical Society, 2007), 5. See above, n. 286.

[398] Ilardi, *Renaissance Vision,* 18-20.

with another reading mirror. Showing church fathers wearing or using optical devices suggests that these inventions were not viewed as inherently manipulative or deceptive, but rather that their helpful properties could be harnessed for spiritually virtuous ends. And, as has been reiterated throughout this study, Tommaso da Modena and his Treviso patrons were not unique in their interest in optical aids.[399]

While it is certainly conceivable that visual artists may have had a more invested interest in optical aids because the very nature of their work relied upon accurate sight, Alfred W. Crosby observed a general increase in Western society's interest in vision during the late thirteenth and fourteenth centuries, noting that, "A society in which the chief conduit of authority was the ear, tilted to the recitation of Scripture and the church fathers, to the somniferous repetition of myths and epics, began to become a society in which the recipient of light ruled: the eye."[400] Verre églomisé reliquary panels in general, and Tommaso's panel in particular, seem uniquely suited to respond to an increasingly visually inclined Trecento culture in complex ways that harnessed optical theory to enhance spiritual devotion. The small size of the holy fragments, the detailed narrative scenes, and the almost illegible authentics, all encouraged a very focused and intense viewing experience. Further emphasizing the visual experience was the fact that, unlike earlier forms of relic worship, these relics did not offer the viewer an opportunity to touch, kiss, or

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[399] Many of the most famous artists of the Trecento painted optical devices made of glass in their frescoes and altarpieces. Examples include Andrea de' Bartoli da Bologna's 1367 scene of philosophers holding a pair of spectacles and a magnifying lens in *Philosophers Confronting St. Catherine* in the burial chapel of Cardinal Albornoz in the Lower Church at Assisi, Giotto's figure of Prudence holding a mirror in his Arena Chapel from 1305, and Ambrogio Lorenzetti's Massa Marittima altarpiece from 1335, which features a representation of Hope holding a mirror with the Trinity once visible in the mirror's reflection.

[400] Alfred W. Crosby, *The Measure of Reality: Quantification and Western Society, 1250-1600* (Cambridge: Cambridge University Press, 1997), 133.

ingest the holy fragments. Set behind the glass plate, these precious fragments were *only* available to one's sense of sight. Furthermore, for one to fully understand the meaning of the relics, they needed to be literate and read the authentics to confirm their sacred nature.

If the reliquary's use of transparent glass and emphasis on the visual experience were conscious responses to the growing interest in the sense of sight, how might Trecento viewers have used this panel to enhance their devotion? To answer this question, it is helpful to examine the ways in which most Trecento verre églomisé reliquary panels differed from their ancient Roman ancestors and other works of Trecento devotional art.

While the technical similarities between Trecento and Early Christian gold glass are undeniable, it is important to note that the fourteenth-century verre églomisé reliquary panels did not simply imitate their Early Christian predecessors. To conduct a more detailed comparison, it is helpful to consult a characteristic example of Early Christian gold glass from the Metropolitan Museum of Art featuring portraits of Saints Peter and Paul dating from the fourth century (fig. 3.17).[401] It is immediately apparent that ancient verre églomisé panels were circular in format while many made in the fourteenth century were rectangular. While the majority of Trecento panels are rectangular, however, at least two circular examples survive. A good example of a circular verre églomisé reliquary is that now incorporated into a fifteenth-century reliquary of St. Mary Magdalen in the collection of the Metropolitan Museum of Art (fig. 6.5).[402]

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[401] These two examples have been selected because, as C. Louise Avery mentions, the fourth century was the apex of Early Christian gold glass and Saints Peter and Paul were very popular Christian subjects. For more, see Avery, "Early Christian Gold Glass," 171 on the fourth-century popularity, 174 on the prevalence of Peter and Paul.

[402] The other circular Trecento example mentioned is the *Reliquary Roundel with The Virgin and Child* on one side and *The Crucifixion* on the other now located in the Kunstgewerbemuseum in Berlin and reproduced in Gordon, "A Sienese Verre Églomisé and its Setting," 148-151.

Another very striking difference between the Early Christian and Trecento examples is that the Trecento glass panel's composition includes a central narrative scene framed by a border of relics. However, it should be noted that the presence of the relics and the function of a reliquary do not explain the prominent stylistic differences. As demonstrated by the Metropolitan's example, the Early Christian compositions generally include frontal flat figures, minimal to no background detailing, and prominent gold-leaf inscriptions which detract from any sense of illusionistic space.[403] In the Trecento glass panels, the saints and holy scenes feature various levels of modeling, coloring, and detail whereas the Roman glasses display a consistent level of detail throughout the image, rarely use color, and do not exhibit the same emphasis on modeling. The degree of shading and color in the Trecento works far exceeds that in the Early Christian glass, a difference enhanced by the lack of a black, or colored, background in the fourth-century examples. The differences found between the Trecento and the Early Christian glass may have been part of a larger artistic trend towards more detailed modeling and naturalism, but these artistic choices should also be considered independent of larger stylistic shifts in order to glean as much meaning as possible. When the detailed, colored, and sketchy quality of the Trecento reliquary panels is contextualized within Franciscan meditative instructions, interesting correlations arise.

One of the most detailed meditative guides roughly concurrent with the reliquaries is Ugo Panciera's *Treatise on Perfection*. Only a few decades prior to the creation of many of the verre églomisé reliquary panels, in approximately 1320, this Franciscan friar described his attempts to elevate his spiritual understanding to divine insight in his *Trattato della perfezione (Treatise on Perfection)*. In his treatise, Panciera described how the process of contemplating the divine was

[403] For more on the types of subject matter featured, typical sizes, and dating, see Avery, "Early Christian Gold Glass," 170-75.

similar to the crafting of an artistic image: as the concept became clearer, it became more modeled, colored, and fleshed out. As Panciera notes, "In the first moment when the mind begins to think about Christ, Christ seems written in the mind and in the imagination; in the second, Christ seems to have been sketched; in the third, he seems to have been under-drawn and under-painted; in the fourth, he seems to have been colored and his flesh to have been painted; in the fifth he seems incarnate and *rilevato*."[404]

Exploring the connections between Tommaso's panel and Panciera's treatise is useful because they are roughly contemporary Franciscan productions of Italy both interested in attaining spiritual insight.[405] Before doing so, however, it is informative to first consider the parallels between Panciera's treatise and Cennini's description of verre églomisé cited earlier in this chapter. In both treatise and description there is clear progression from obscurity to clarity. Both outline how to make something more evident: for Panciera it is a mental conception, for Cennini a gold-glass painting. To begin each process, one must start with a blemish-free canvas. For Cennini this is evident when he specifies that the glass must be white, clean and devoid of

[404] "Nel primo tempo nel quale la mente comincia colle infrascritte circunstanzie di Cristo a pensare, Cristo pare nella mente e nella imaginativa scritto. Nel secondo pare disegnato. Nel terzo pare disegnato e ombrato. Nel quarto pare colorato e incarnato. Nel quinto pare incarnato e rilevato. Tanto ha la mentale virtù attiva di perfezione, quanto può colla corporale virtù attiva regnare. Questo stato della mentale virtù attiva, colla corporale virtuosa azione, merita, per divina giustizia, il dono della meditazione e della contemplazione." For the original Italian version, see Arrigo Levasti, *Mistici del duecento e del trecento* (Milano: Rizzoli, 1960), 273. For translated version, see Lars R. Jones, "Visio Divina? Donor Figures and Representations of Imagistic Devotion; The Copy of the *Virgin of Bagnolo* in the Museo dell'Opera de Duomo, Florence," in *Italian Panel Painting of the Duecento and Trecento,* ed. Victor M. Schmidt, Studies in the History of Art 61, Center for Advanced Study in the Visual Arts Symposium Papers XXXVIII (CASVA Symposium, Florence and Washington, June and October 1998) (Washington, DC, New Haven, CT, and London: Yale University Press, 2002), 44.

[405] The panel and treatise are not exact contemporaries; rather, the treatise predates the panel by a couple of decades. This time difference could have allowed Panciera's ideas to circulate, that is, if Panciera was not reflecting a general practice in the first place rather than innovating the ideas himself.

bubbles and green cast. For Panciera, it is assumed that one is coming as a Christian with an open mind and heart. From this foundation, one must build up one's design or understanding carefully and by relying on God's grace.

Applying the same conceptual framework to the devotional panel by Tommaso da Modena reveals that similar ideas were common in meditative practice, artistic technique, and in the visual arts. In a manner similar to Panciera's developing mental image, Tommaso's panel features different media and imagery with various degrees of detail, coloration, and modeling. As such, the imagery was capable of offering visual manifestations of the various stages of developing insight with an inverse relationship between the amount of visual definition and the complexity of the theological doctrine. In other words, the more complex the idea, the less clarity there is in both the conceptual understanding and visual description.

Panciera's fifth stage, where the idea is "incarnate and rilevato," equates a visually vivid image to conceptual clarity. The most accessible and straightforward elements of Tommaso's panel are arguably the relics. The holy fragments are not depictions of something else; rather, they *are* sacred entities. The relics are literally "incarnate and rilevato" as described in Panciera's fifth stage and, although they ultimately referred to the saint residing in heaven, they did so in very familiar terms, presenting the viewer with pieces of objects such as a tooth, hair, cloth, or wood. The authentics further verified and documented the identity of these fragments, making them even more clearly presented.

The full-length portraits of the saints and the symbols of the Evangelists in the outermost border of the wooden frame are the most developed illusionistic imagery in the piece. Painted with a relatively wide range of colors, high degree of spatial perspective, and naturalistic details, these figures are some of the largest in the panel. In addition, these painted portraits have

carefully modeled physiognomies, individualized facial expressions, and varied gestures. They wear different hairstyles and are shown in a range of formats (e.g., full-length, 3/4-length, and half-length). With their detailed description, these figures could have easily correlated with Panciera's fourth level, the level where the image "seems to have been colored and his flesh to have been painted."

Moving inward to the border of verre églomisé saints, one finds that these portraits are also highly individualized, but not modeled to the same degree of detail as their painted counterparts on the wooden frame.[406] These verre églomisé saints are smaller, their poses are more limited, and the use of color is restricted. The figures are comprised of black lines and gold leaf while the red and green color is restricted to the background. Therefore, the verre églomisé saints could have reflected Panciera's third stage, the under-painting and under-drawing, where the imagery is less developed but still has a fair degree of modeling and color.

Moving inward still, at the very center of the gold glass, Christ on the cross is modeled in a manner similar to the adjacent saints, but the scene's background is completely black. The only color used is the small amount of red describing the blood of Christ. This portion of the panel contains the least color and correspondingly this scene depicts one of the most complex Christian beliefs—the death and resurrection of Christ—allowing it to serve as a visual manifestation of the second, sketched phase of Panciera's model. The analogy to a sketch becomes even more appropriate when one observes that the individualized lines etched into the gold leaf are clearly visible, giving the image of Christ a very linear quality.

[406] Such a difference certainly stems from the fact that there is a difference in media; nevertheless, the end result is images with varied levels of modeling and I argue this is the key for the viewer and intended by the patron and artist.

During the first phase of Panciera's developmental scheme, one does not yet have a clear enough understanding to envision the concept. As Panciera explains, at this moment, the difficult concept is still in "written" form; it has not yet taken mental shape. The authentics are certainly one aspect of the panel that could relate to this description; however, these written labels are intimately connected to the relics, making it unlikely that they were meant to be viewed on their own. This is why it is useful to expand consideration of the "written" stage beyond the confines of the devotional panel to the Bible, the written word of God and the basis for all Christian belief. As it is said in the introduction of John's gospel, "In the beginning was the Word, and the Word was with God, and the Word was God." With this in mind, it is helpful to consider the most elusive story or concept in the Christian faith, namely the Beatific Vision, as a fitting correlation here.

By combining the painted figures with the imagery in the verre églomisé panel, Tommaso da Modena's reliquary tabernacle gave visual form to complex conceptual frameworks such as that behind Panciera's treatise. The tabernacle harnessed both the advantages of panel painting as well as those of verre églomisé to offer their viewer multiple contemplative avenues. In a style similar to Orcagna's *Christ with Madonna and Saints* from the Strozzi Chapel in Florence's Santa Maria Novella (fig. 6.6) and Bernardo Daddi's *Madonna and Child Enthroned* enshrined within Orcagna's tabernacle in Orsanmichele (fig. 3.2), the painted figures in Tommaso's panel were naturalistic and realistically colored, existed in illusionistic space, and evoked vernacular details. Set before a gold background, the painted figures seemed to hover in a supernatural realm, conveying the idea that the saints depicted resided in heaven. In the case of the verre églomisé portraits, the situation was reversed. The figures did not inhabit a golden realm; rather, the figures themselves emitted the radiant light. Perhaps it was this unique trait that inspired

Cennini's special appreciation for the medium and its use in decorating relics. These scenes and portraits shone their divine qualities from within, rather than merely deriving them from their setting.

The gilded figures' ability to emanate light was not only visually impressive but also reflected the Franciscan theology of light. Bonaventure, like many others of his time, held two basic beliefs about the nature of light: first, it was thought to have a corporeal form and, second, it was the very first form of matter, the form that gave way to all other forms of matter.[407] Thus, for Bonaventure, light had a dual nature: it was both material and spiritual and it was capable of existing in and symbolizing both the heavenly and the earthly. When viewing Tommaso's panel, a Trecento viewer could have found evidence for both these spiritual and mundane qualities of light. On the one hand, light reflected off the gilded glass and created radiant, shimmering golden highlights. When reflecting off the panel, the warm, golden light would have obscured the glass's surface and, in a sense, dematerialized the panel's physicality and evoked a more transcendental, or heavenly, splendor. In this way, the light could have served as a symbol of God's divine nature. On the other hand, when light fell on the portions of transparent glass, it illuminated the relics and the glass panel, offering one the opportunity to study the fragments and read the authentics. Able to now view these holy remains in a more empirical way, the viewer could have been reminded that, in addition to the spiritual nature of God, the divine also had a more earthly manifestation in the human form of Jesus. Thus, the lighting effects produced by the panel offered a powerful metaphor for one of Christianity's most complex and important doctrines by evoking both the spiritual nature and earthly form of the divine.

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[407] Lucia Miccoli, "Two Thirteenth-Century Theories of Light: Robert Grosseteste and St. Bonaventure," *Semiotica* 136 no. 4 (2001): 78-79.

Whatever developmental stage of Panciera's scheme the viewer was at, there was a corresponding visual element within Tommaso's panel on which to set one's gaze. Through the various lighting effects and the different treatments of the glass, the reliquary panel could have also accommodated whether one wanted to contemplate the human qualities of Christ or the divine aspects of God. By combining these seemingly opposing qualities, Tommaso's panel resonated with Trecento visuality and devotion in complex ways—demonstrating for the modern reader the means by which fourteenth-century art, religion, and science intersected, and shedding greater light on how Trecento devotional artworks were understood and used.

Thus, as was outlined in earlier chapters, the revival of verre églomisé in the late Duecento coincided with the rise of glass production, the introduction of Islamic glass arts and optical treatises, and the increasing general interest in the sense of sight. In practical terms, the rising availability of transparent glass caused an increase in the production and use of eyeglasses, mirrors, and lenses, extending one's period of optimal eyesight, allowing for more opportunities to see one's reflections, and informing scientific experiments. In theoretical terms, the Islamic and ancient treatises on optics and the anatomy of the eye inspired new debates and ultimately, new conclusions about the visual process. Spiritually, one's visual experience of the natural world was being harnessed to inspire divine insight, as both earthly sight and light were equated with heavenly counterparts, a shift due in large part to the growing popularity of the Franciscan outlook. Each of these significant cultural shifts affected people's relationship to vision and inspired new ways of using this powerful sense to enhance their understanding of the divine.

This chapter has analyzed and contextualized a group of verre églomisé reliquaries as well as two main case studies in order to better understand how these objects can contribute to a more informed view of Trecento art and visuality. The gilded glass within the reliquaries was

part of a larger artistic trend which simultaneously evidenced a continued interest in medieval tradition and aesthetics as well as an embrace of new glass-making technology. While the portions of transparent glass also capitalized on more efficient and effective glass-production techniques, the devotional function of the transparent glass was very different. Each type of glass embodied its own complex associations and symbolism. By combining these two seemingly opposing aesthetics and their related traditions, the verre églomisé reliquaries were capable of elegantly symbolizing the dual nature of Christ as both fully human and fully divine in a way that resonated with concurrent scientific theory, artistic practice, and devotional pursuits, particularly those of the Franciscans. Because of their ability to simultaneously embody all these various associations, the verre églomisé reliquaries were uniquely suited to the cultural crossroads that was the Trecento.

CHAPTER SEVEN

CONCLUSION

> "Glass shifts authority from the word, from the ear and the mind and writing, to external visual evidence. The authority of elders is challenged; the test is the individual eye and the authority of the doubt-filled and skeptical individual. The primacy of demonstration through showing something happening became obvious. One must test every piece of received wisdom by the evidence of one's eyes. What others see in an experiment, which is potentially reproducible, is more important than what is asserted by authority (the word)."[408]
>
> -Alan Macfarlane, *Glass: A World History*

Alan Macfarlane argues that glass contributed greatly to the early modern world's emerging emphasis on empirical observation and experimentation. Not surprisingly, the rising glass industry coincided with a growing interest in the sense of sight and visual information over the

[408] Alan Macfarlane and Gerry Martin, *Glass: A World History* (Chicago: University of Chicago Press, 2002), 48-49.

course of the thirteenth and fourteenth centuries. At this time, as Alfred W. Crosby observes, "A society in which the chief conduit of authority was the ear, tilted to the somniferous repetition of myths and epics, began to become a society in which the recipient of light ruled: the eye."[409] This study was inspired by similar lines of inquiry but has explored these ideas through an examination of a specific aspect of this trend, namely, the use of glass in the devotional context of viewing relics.

Unlike Macfarlane's work, this study has not argued that there was a linear development to the technology, reception, or use of glass. Neither does it claim to be a comprehensive catalogue of all the Trecento reliquaries or artworks that incorporate glass. Rather, it has followed Pamela Smith's methodology, which asserts that an understanding of the evolving and interrelated natures of science, technology, and medicine should be based on the way people interacted with raw materials.[410] By examining the various ways artists, theorists, and viewers used, interacted with, and conceptualized glass at this time, this study has aimed to demonstrate that the various uses and associations with glass in the areas of science, technology, art, and science were mutually informing each other and that understanding these relationships provides insight into the larger phenomenon of Trecento visuality.

With the growing availability of manufactured glass during the Trecento, early modern individuals were able to manipulate this medium in order to see, and thus presumably

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[409] Alfred W. Crosby, *The Measure of Reality: Quantification and Western Society, 1250-1600* (Cambridge: Cambridge University Press, 1997), 133.

[410] For more on what Smith calls *sci-tech-med,* see Pamela Smith, "Science on the Move: Recent Trends in the History of Early Modern Science," *Renaissance Quarterly* 62 no. 2 (Summer 2009): 247. Her assertion that one should begin a consideration of a culture's science by analyzing their interactions with raw materials was expressed at a roundtable discussion, Pamela Smith and others, "Roundtable Discussion: New Trends in the History of Renaissance Science and Medicine" (sponsored by The Renaissance Society of America, held at The Graduate Center, CUNY, New York, NY, October 19, 2012).

understand, the natural world in new ways. Transparent glass fashioned into lenses counteracted optical deficiencies and helped individuals see their natural environment more accurately. Glass mirrors and windows provided detailed visual access to one's reflection or vistas of landscape. At the same time, clear glass may have helped theorists to conceptualize the visual process and anatomy of the eye by equating the parts of the eye to crystal and glass.

One's visual experience of the world gained spiritual import with the increasing view that God's presence was discernible through his creation. The interest in the natural world, emblematic of the growing Franciscan movement, and the new optical technologies fueled the desire to *see* the physical evidence with one's own eyes. When it came to spiritual matters, experimentation was not possible, but visible proof of the divine presence in the earthly realm was available. Relics, as sacred intersections of the heavenly and earthly, served an important role in Christian devotion because they referred to their saints' human and sacred forms. Thus, ultimately, they were vehicles for better understanding Christ's dual nature as both human and divine.

In Trecento reliquaries, relics and authentics were put on display using transparent glass, a medium that could both reveal and contain holy relics. Viewers could have used their sense of sight to make a direct connection with the sacred relics. There was no longer a need to imagine the sacred fragments encased within the gem-covered gold containers. However, while many Trecento reliquaries utilized clear glass for the display of relics, it should also be noted that they did not completely abandon aspects of earlier reliquary decoration. Artists continued to incorporate figurative narrative imagery and used gilded glass to create dramatic lighting effects with gold reflections.

In order to explore the larger implications and questions raised by this situation and summarize some of the main points from the previous chapters, this discussion concludes with two case studies: the *Reliquary Frame* from the Cleveland Museum of Art (fig. 7.1) and the *Reliquary in the Form of a Triptych* from the Società degli Esecutori delle Pie Disposizioni of Siena (fig. 7.2).[411] Neither the *Reliquary Frame* nor the *Reliquary in the Form of a Triptych* fits neatly within any of the previous chapters; rather, they combine aspects from different chapters, and for this reason they are treated separately here. Both reliquaries incorporate a combination of round relic-windows made from transparent glass and verre églomisé imagery. Further uniting these two reliquaries is the fact that they were both produced around the middle of the fourteenth century in Siena, made for public viewing, and associated with prominent charitable institutions. Analyses of these reliquaries within the context of the previous chapters can serve as a summary of many of the points already made as well as suggest possible avenues for further research concerning the nature of a Trecento reliquary, the connections between theory and practice, and the implications for study of the impact of the Black Death.

The reliquary from Cleveland is a double-sided gabled rectangle framework punctuated by seventeen glass relic-windows. It once held two panels of verre églomisé back to back at the center of the frame. One panel, now in Cambridge's Fitzwilliam Museum, features the Virgin and Child Enthroned with Saints and the Annunciation (fig. 7.3).[412] The other panel, now lost,

[411] For more on the frame from Cleveland see Martina Bagnoli and others, eds., *Treasures of Heaven: Saints, Relics, and Devotion in Medieval Europe* (New Haven, CT: Yale University Press, 2010), 202-203. For the *Reliquary in the Form of a Triptych,* see Giovanni Previtali, *Il gotico a Siena: miniature, pitture, oreficerie, oggetti d'arte* (Florence: Centro Di, 1982), 246-248.

[412] The artwork has two inventory numbers: M. 56 and A-1904.

featured the Crucifixion.[413] Thus, in terms of iconography and the way the artist juxtaposed the relic fragments surrounding the verre églomisé imagery, this piece follows the basic pattern established in the Franciscan diptychs from Umbria discussed in chapter 6. However, this work was not affiliated with the Franciscans of Umbria. Rather, inscriptions and heraldic panels indicate that this work was associated with the Ospedale di Santa Maria della Scala and specifically with this charitable institution's rector from 1340 to 1351, Mino di Cino Cinughi.[414]

The *Reliquary in the Form of a Triptych* (fig. 7.2) was associated with a lay confraternity also based at Santa Maria della Scala. Originally this organization was known as the Compagnia della Madonna sotto le volte dello Spedale di Santa Maria della Scala, but was later called the Società degli Esecutori delle Pie Disposizioni. This reliquary, attributed to Lippo Vanni, is a large, vertical, rectangular panel supported by a small, footed base below and surmounted by three main pinnacles adorned with smaller sculptural spires at the top.[415] The wooden structure is not the original framework; rather, it is a later remake that followed the original.[416]

That both of these works were affiliated with the hospital of Santa Maria della Scala is not surprising; the civic world was intimately connected with the religious one at this time. In fact, the hospital and cathedral were closely related in physical terms—located across a piazza from one another—and aligned in terms of their mission to serve the spiritual and physical needs of the people of Siena. In addition to treatment rooms, the hospital also housed several chapels

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[413] Bagnoli, *Treasures of Heaven*, 203.

[414] Ibid.

[415] Leone de Castris attributed the work to Niccolò di Ser Sozzo in 1979 but, based on stylistic comparisons, Giovanni Previtali attributed it to Lippo Vanni in 1982; see Previtali, *Il gotico a Siena*, 246.

[416] Ibid.

and, as mentioned, was home to lay confraternities who were charged with serving the Lord through their service. During the first half of the fourteenth century, Siena's primary hospital not only cared for the sick and dying but also provided services to orphans and pilgrims. The institution's relics would have energized all these philanthropic endeavors.

The compositions of these two reliquaries reinforce their institutional associations. Like the reliquaries with transparent relic windows discussed in chapter 5, both works discussed here resemble a chapel or church façade. Particularly noteworthy is the resemblance between the *Reliquary in the Form of a Triptych* and the façade of the Sienese cathedral. Giovanni Pisano designed the cathedral's entrance and began construction on the lower portion in the late thirteenth century and completed it by the early fourteenth.[417] Thus, by the time Lippo Vanni was working on his reliquary, the archways surrounding the three main portals were completed. A comparison (fig. 7.4) between the lowest register of the façade and the largest register in the reliquary—that is, the third from the bottom—demonstrates that the artists took a similar approach. In both the church and reliquary, just under the three pointed arches one finds a roundel; in the church façade the roundel contains a sculptural bust of a saint while in the reliquary it contains a holy relic. Another strong visual link is found in the treatment of standing saints in niches on the far sides of the church and reliquary. In each case, smaller saints with full-length standing poses fill niches covered in pointed arches.

If this notion of the reliquary as church façade is extended further, in both the Cleveland frame and the *Reliquary in the Form of a Triptych*, the church's doorways compositionally correspond with the verre églomisé panels. The glass roundels containing the relics are not the main focus of attention. In compositional terms, the roundels with the relics seem to adorn or

[417] John White, *Art and Architecture in Italy: 1250-1400* (New Haven, CT: Yale University Press, 1993), 114.

frame the verre églomisé imagery just as the cathedral's sculptural busts set in roundels accent the large portals. If this formal analysis is extended to a metaphoric reading, the verre églomisé imagery may also function like the church portals. The cathedral's doorways allowed one to physically leave behind a more mundane setting and enter into a more sacred space, namely, the church interior. The reliquary panel may have performed a similar function by providing a conceptual pathway rather than a physical one. As Ugo Panciera's various meditative steps suggested, prayer could have been understood as a mental journey. Thus, when using the *Reliquary in the Form of a Triptych* as a devotional aide, the primary avenue for one's meditative progress would have corresponded to the verre églomisé imagery, not—perhaps surprisingly—the glass roundels containing the relics.

This point deserves extensive consideration, as it is similar to the situation found in the Franciscan diptychs and in transparent glass reliquaries. Though it seems counterintuitive at first, in many of the reliquaries discussed throughout this study, the relics are relegated to the margins. One of the reasons for this may derive from the small size of the relic fragments featured in the reliquaries and the lack of available, large, intact relics on the relic market. As individual fragments, the minute relics are not large enough to stand on their own as the compositional center and visual focus of a reliquary. Grouping them together at the center of the piece was certainly an option but, if that were the case, the main focus of the work would have been on the saintly intercessors rather than God. By placing the relics on the margins and putting focus on imagery featuring Christ and the Virgin Mary, the theological emphasis matched the compositional one. In other words, in terms of church hierarchy, the saints were intercessors and correspondingly, in terms of the reliquaries' compositions, the relics were secondary to imagery focused on the nature of Christ.

Thus, while the relics were undoubtedly very precious, this analysis suggests that they were not the devotional focus of the artworks but rather a means to an end. They functioned as meditative tools to help with the faithful viewer's ultimate spiritual aim: direct contemplation of God. The mysterious and miraculous nature of God was more accurately and directly expressed in the scenes of the Crucifixion or the Virgin and Christ Enthroned than through the various saints. As venerated as these relics were, they were incapable of capturing the sanctity of either Mary or Christ because these figures did not leave behind primary relics but rather were assumed into heaven with both their bodies and souls.

Although relics were some of the most inspirational and venerated objects owned by the Church, they had limitations. Relics were not able to provide a point of physical contact between the viewer and God. Indeed, the most holy figures to have walked the earth, Mary and Christ, did not leave even primary relics. Thus, the holy relics could only take one so far. To contemplate the most sacred mysteries of the Christian faith one needed to mentally ascend from contemplation of the intersection of the heavenly and earthly to direct meditation on God.

Glass, in its various forms, provided the Trecento artist a multifunctional medium that could simultaneously inspire complex devotional strategies. While the transparent glass used as relic windows could have resonated with the growing interest in the sense of sight and the value of empirical observation, the gilded imagery provided an opportunity to contemplate more metaphysical aspects of one's faith through the golden imagery of the verre églomisé. The artists realized that when it came to the notion of the Beatific Vision, not even the finest transparent glass or the strongest magnifying lens was helpful and they therefore employed a different visual system entirely.

Such an analysis raises important questions for further inquiry. Considering that the visible relics in some of the Trecento reliquaries are found on the margins, is it possible that, in these cases, the primary devotional focus was elsewhere? If so, this may indicate that there were different conceptions of the function of a reliquary or that the nature of the reliquary was in flux. If this were the case, it would be worth further exploring whether the different styles of presenting relics corresponded to different devotional functions. Whatever the case, the nature of the relationship between seeing and believing requires more study.

The notion that Trecento artists were employing various visual strategies in the first half of the century may help inform art history's debate regarding the nature of the impact of the Black Death. Though revised over the last several decades, Millard Meiss's theory that the devastating impact of the plague inspired stylistic experimentation away from naturalism still dominates any discussion of Trecento style. This study contributes to a more complete understanding of Trecento style before the plague because it demonstrates that multiple visual languages could be found within a single work already in the first half of the century. For example, Tommaso da Modena's reliquary incorporates naturalistic paintings of saints alongside a verre églomisé reliquary panel. This observation indicates that even before the infamous onset of the plague in 1348, there were artists employing non-naturalistic styles and, in fact, some of these artists were the very same artists who were contributing to the growing interest in naturalistic painting. Thus, it should be understood that different stylistic approaches were explored throughout the Trecento, not just after 1348.

Also due for more scholarly attention is the question of how late-medieval optical theory related to Trecento artistic practice. Though Hayden Maginnis and Paul Hills have made suggestions that such connections existed, further examination of the specific vehicles of

transference is needed. For example, further research into the fact that famous fourteenth-century artists were associated with various types of Trecento glass will no doubt reveal more information. For example, more needs to be done to contextualize Tommaso da Modena's extensive depictions of glass optical devices alongside the reliquary he made that used a verre églomisé reliquary panel. The same holds true for the case of Simone Martini, an artist who used verre églomisé insets into both panel paintings and frescoes as well as worked with stained glass. Perhaps most interesting of all are the many ways Giotto and his workshop incorporated glass—including the glass insets in the halo of Christ in his monumental crucifix for Santa Maria Novella and his or his workshop's depiction of mirrors at the Arena Chapel, Baroncelli altarpiece, and in the vault of the Lower Church at Assisi—alongside the artist's possible intersections with Fra Giordano, the preacher who alerted the Florentine public to the invention of eyeglasses in 1305.[418]

In the end, it must be acknowledged that the reciprocal relationship between the visual arts and a culture's visuality is a complex one. This study has contributed to a better understanding of the Trecento situation by using glass as a specific site of inquiry, but more research is needed to attain a fuller picture of the nature of Trecento art, science, and their relationship to one another.

[418] Vincent Ilardi, *Renaissance Vision from Spectacles to Telescopes* (Philadelphia: American Philosophical Society, 2007), 5.

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Illustrations

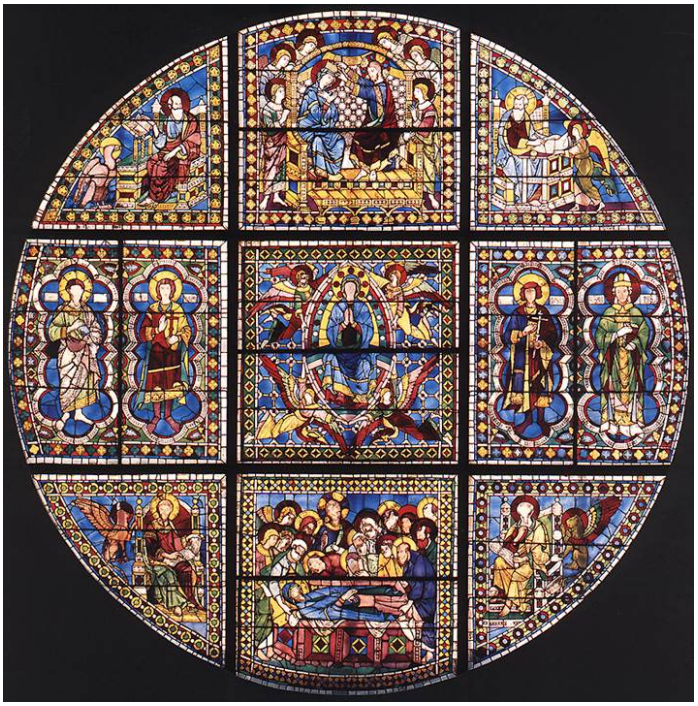

Fig. 2.1. Duccio, *Rose Window with Scenes of the Dormition, Assumption, and Coronation of the Virgin*, ca. 1288, Cathedral, Siena.

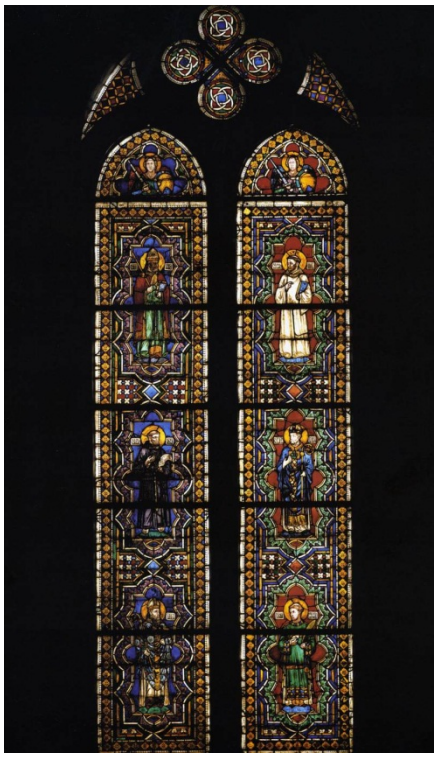

Fig. 2.2. Simone Martini, *Lancet Window with Saints*, ca. 1312, Chapel of St. Martin, Lower Church, Assisi.

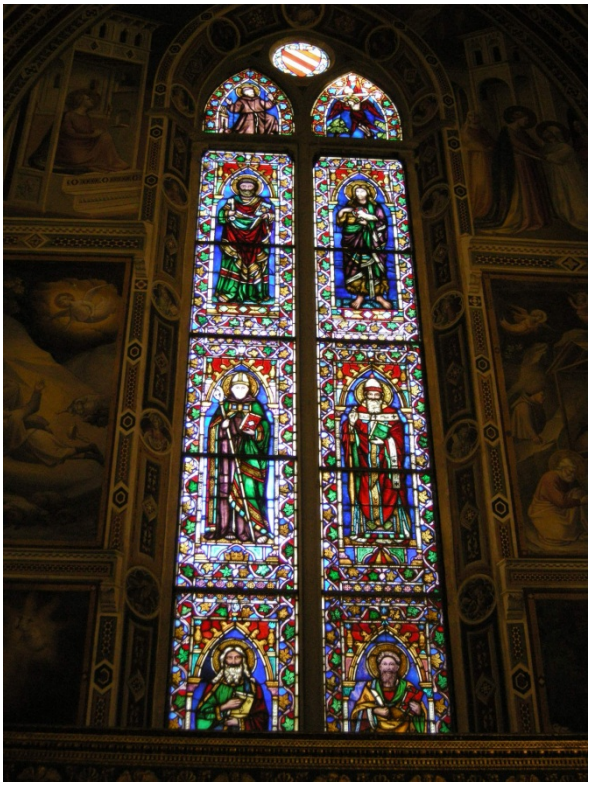

Fig. 2.3. Taddeo Gaddi, *Stained Glass Window with Saints, the Stigmata, and the Baroncelli Coat of Arms*, ca. 1330, Baroncelli Chapel, Santa Croce, Florence.

Fig. 2.4. Mesopotamian Workshop, *Glass Bottle from Ur*, ca. 1500 BCE, British Museum, London.

Fig. 2.5. Egyptian Workshop, *Eye Paint Container of Blue Glass*, ca. 1450 BCE, British Museum, London.

Fig. 2.6. Greek Workshop, *Mosaic Glass Bowl*, second century BCE, Metropolitan Museum of Art, New York.

Fig. 2.7. Flemish Workshop, *Stavelot Triptych,* ca. 1150, Morgan Library, New York.

Fig. 2.8. Limoges Workshop, *Chasse with the Crucifixion and Christ in Majesty,* ca. 1180–90, Metropolitan Museum of Art, New York.

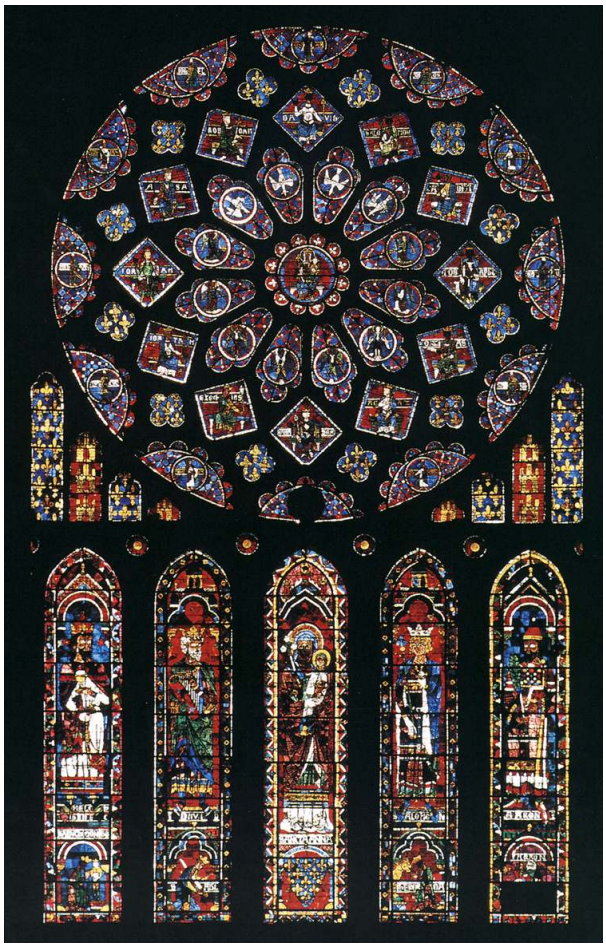

Fig. 2.9. French Workshop, *North Rose Window*, ca. 1220, Chartres Cathedral, Chartres.

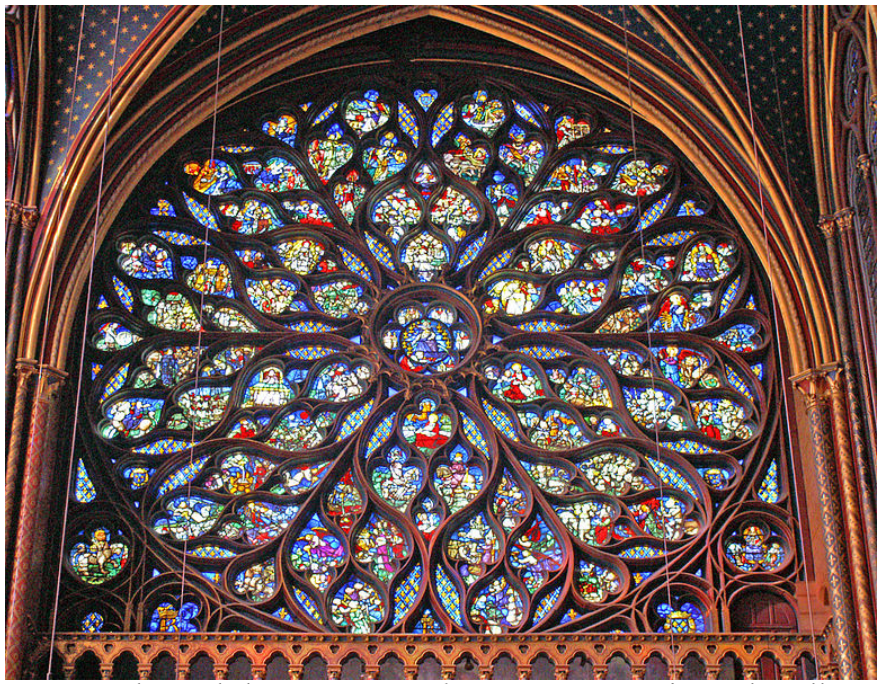

Fig. 2.10. French Workshop, *Rose Window*, ca. 1240s, Sainte-Chapelle, Paris.

Fig. 2.11. Duccio, Reconstruction of the *Maestà*, ca. 1308-1311, Cathedral, Siena.

Fig. 2.12. Duccio, Detail from *Maestà* showing *Virgin Enthroned,* ca. 1308-11, Cathedral, Siena.

Fig. 2.13. Duccio, Detail from *Maestà* showing the *Last Supper,* ca. 1308-11, Cathedral, Siena.

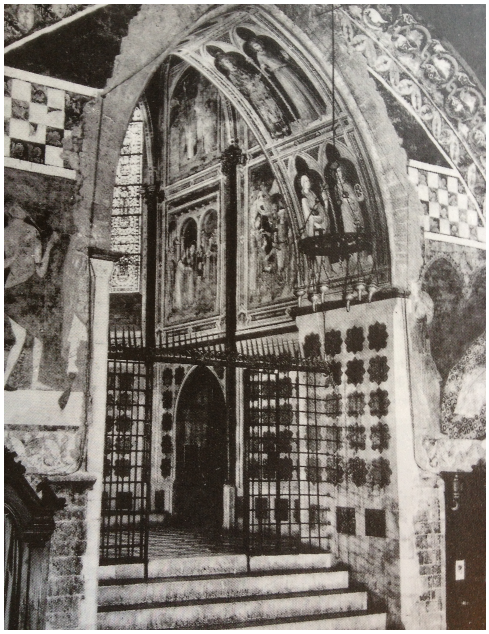

Fig. 2.14. Simone Martini, Chapel of St. Martin, ca. 1317, Lower Church, Assisi.

Fig. 2.15. Simone Martini, *Funeral of St. Martin,* ca. 1317, Chapel of St. Martin, Lower Church, Assisi.

Fig. 2.16. Simone Martini, *Painted Saints in Entry Archway*, ca. 1317, Chapel of St. Martin, Lower Church, Assisi.

Fig. 2.17. Simone Martini, *Saints from Stained Glass Windows*, ca. 1317, Chapel of St. Martin, Lower Church, Assisi.

Fig. 2.18. Simone Martini, *Angels from Stained Glass Windows*, ca. 1317, Chapel of St. Martin, Lower Church, Assisi.

Fig. 2.19 a-b. Simone Martini, (left) *The Knighting of St. Martin,* (right) *St. Martin and the Miraculous Mass*, ca. 1317, Chapel of St. Martin, Lower Church, Assisi.

Fig. 2.20 a-b. Simone Martini, (left) *St. Martin in Meditation*, (right) *Dream of St. Martin,* ca. 1317, Chapel of St. Martin, Lower Church, Assisi.

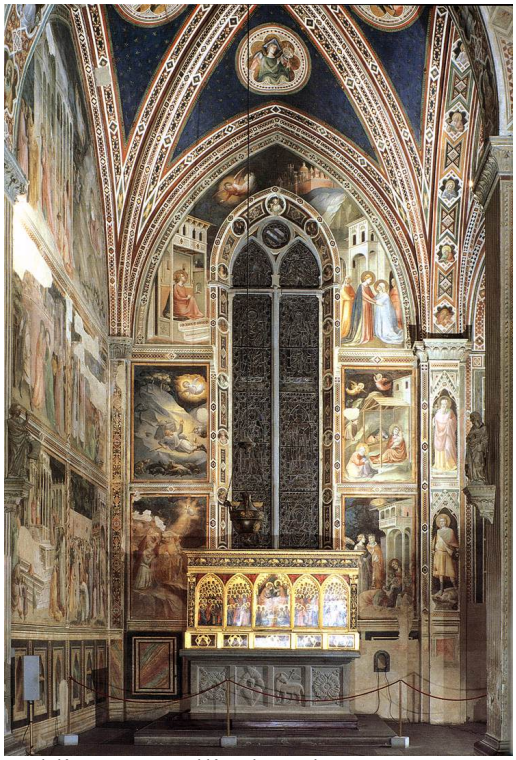

Fig. 2.21. Taddeo Gaddi, Baroncelli Chapel, ca. 1330, Santa Croce, Florence.

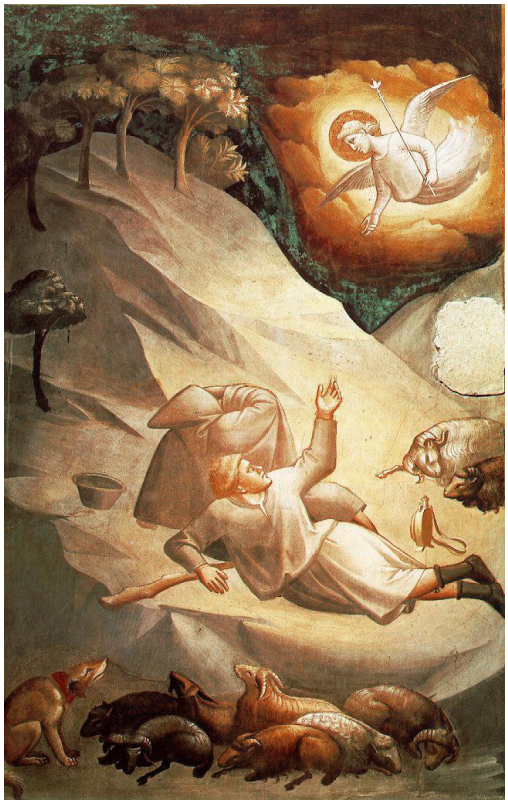

Fig. 2.22. Taddeo Gaddi, *Annunciation to the Shepherds*, ca. 1330, Baroncelli Chapel, Santa Croce, Florence.

Fig. 2.23. Giotto and Workshop, *Pinnacle for the Baroncelli Altarpiece*, ca. 1334, San Diego Museum of Art, San Diego.

Fig. 2.24. Taddeo Gaddi, *Illusionistic Niche*, ca. 1330, Baroncelli Chapel, Santa Croce, Florence.

Fig. 3.1. Giotto, Detail of *Crucifix*, ca. 1295, Santa Maria Novella, Florence.

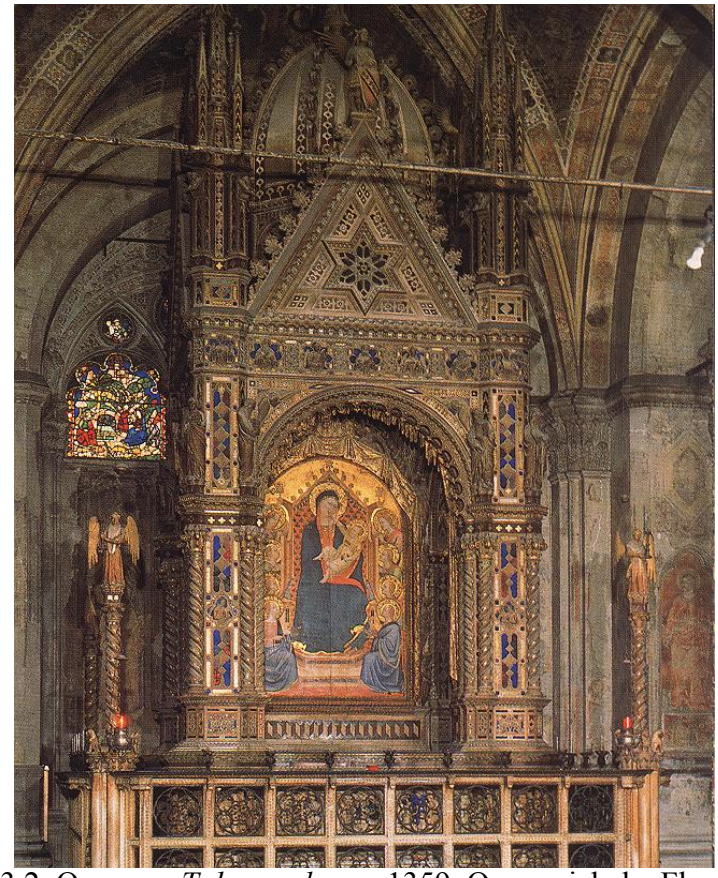

Fig. 3.2. Orcagna, *Tabernacle,* ca. 1359, Orsanmichele, Florence.

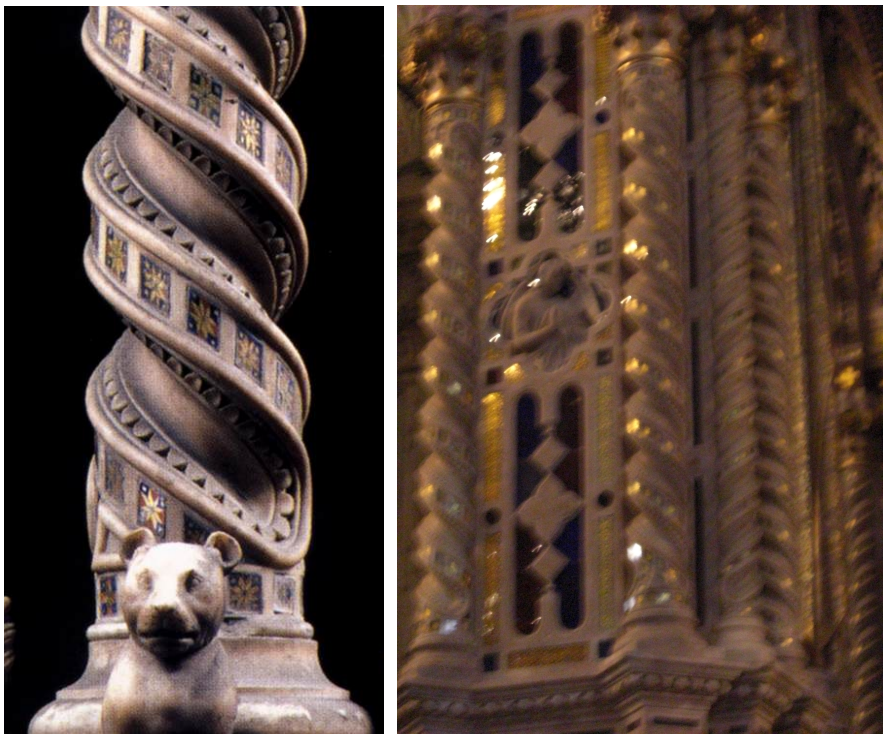

Fig. 3.3 a-b. Orcagna, Details of *Tabernacle,* ca. 1359, Orsanmichele, Florence.

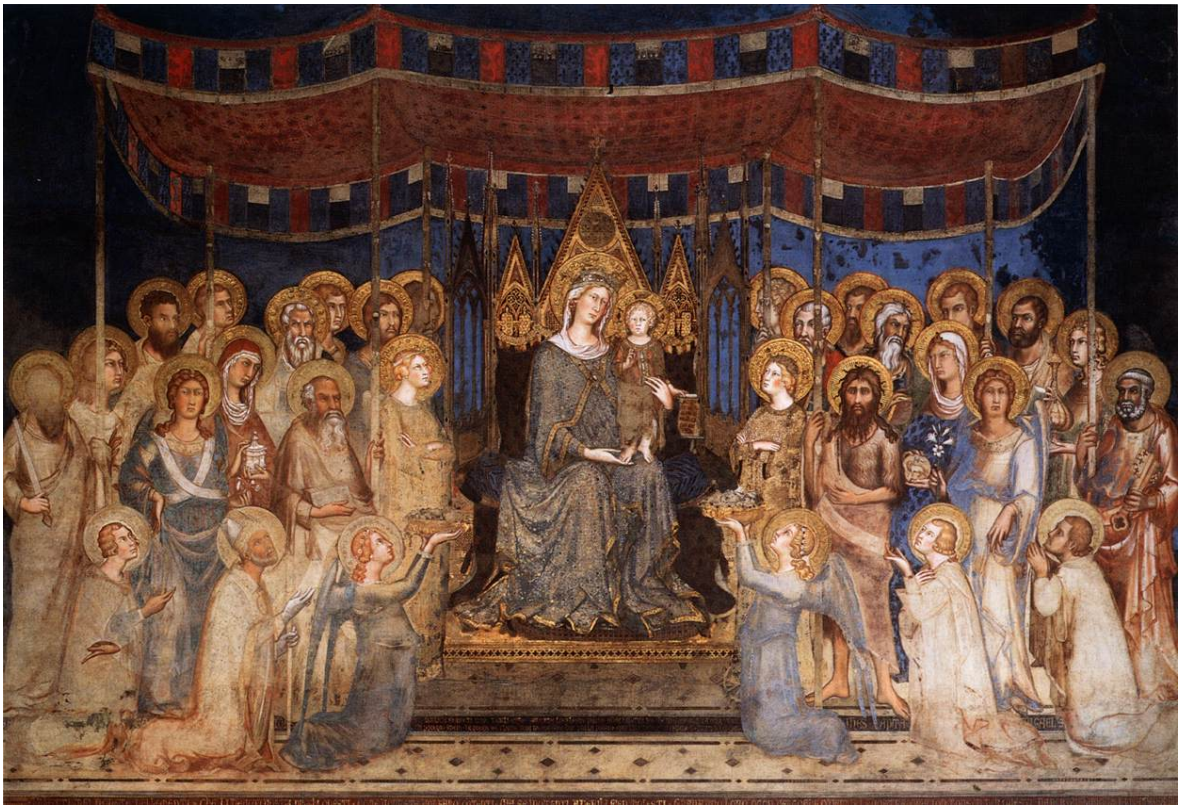

Fig. 3.4. Simone Martini, *Maestà,* ca. 1315, Palazzo Pubblico, Siena.

Fig. 3.5. Simone Martini, Detail of *Maestà,* ca. 1315, Palazzo Pubblico, Siena.

Fig. 3.6. Paolo di Giovanni Fei, *Madonna and Child,* 1370s, Metropolitan Museum of Art, New York.

Fig. 3.7. Lorenzo Monaco, *Virgin and Child Enthroned with Saint John the Baptist and Saint John the Evangelist,* ca. 1408, Museo Civico di Torino.


Fig. 3.8. *The Good Shepherd,* ca. 425, Tomb of Galla Placidia, Ravenna.

Fig. 3.9. Coppo di Marcovaldo, *Last Judgment,* ca. 1250-1300, Baptistery, Florence.

Fig. 3.10. Italian Workshop, Ceiling fresco with insets of silver-backed glass, mid-thirteenth century, Lower Church, San Francesco, Assisi.

Fig. 3.11. (left) Triptych with *Man of Sorrow*s, ca. 1380, (right) Detail of *Man of Sorrows,* ca. 1300, Basilica di Santa Croce in Gerusalemme, Rome.

Fig. 3.12. Orcagna, Back of *Tabernacle* with *Assumption,* ca. 1359, Orsanmichele, Florence.

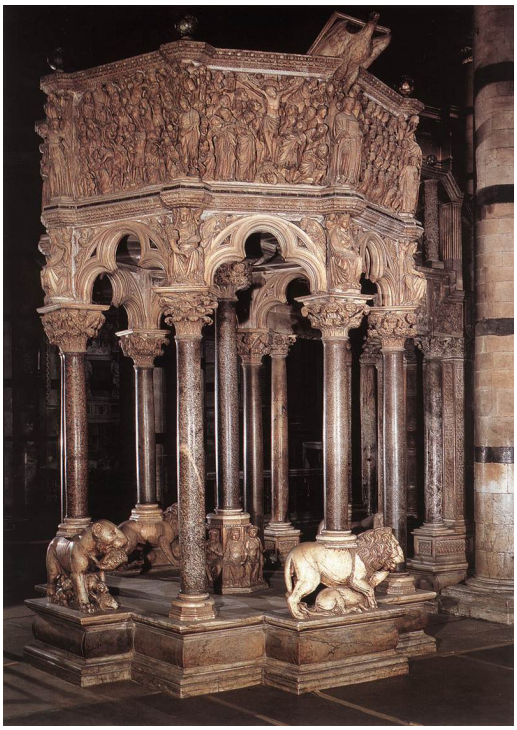

Fig. 3.13. Nicola Pisano, *Pulpit,* ca. 1365-69, Cathedral, Siena.

Fig. 3.14. Nicola Pisano and others, *Arca di San Domenico,* 1264-67 with later modifications through the sixteenth century, San Domenico, Bologna.

Fig. 3.15. Simone Martini, *St. Louis of Toulouse,* ca. 1317, Museo Nazionale di Capodimonte, Naples.

Fig. 3.16. Southern Italian Workshop, *Sandwich Gold-Glass Bowl*, third century BCE, British Museum, London.

Fig. 3.17. Roman Workshop, *Bowl Base with Saints Peter and Paul Flanking a Column with the Christogram of Christ*, late fourth century, Metropolitan Museum of Art, New York.

Fig. 3.18. Syrian Workshop, *Fragmentary Cup*, late 9th-10th century, The David Collection, Copenhagen.

Fig. 3.19. Syrian Workshop, *Bottle*, ninth-tenth century, British Museum, London.

Fig. 3.20. Syrian Workshop, *Cup*, ninth-tenth century, Corning Museum of Glass, Corning, NY.

Fig. 3.21. Nicola Pisano, Detail of *Arca di San Domenico,* 1264-67, San Domenico, Bologna.

Fig. 3.22. Nicola Pisano, Detail of *Arca di San Domenico,* 1264-67, San Domenico, Bologna.

Fig. 3.23 a-b. Nicola Pisano, Details of *Pulpit,* ca. 1365-69, Cathedral, Siena.

Fig. 3.24. Fra Guglielmo, *Pulpit,* ca. 1270, San Giovanni Fuorcivitas, Pistoia.

Fig. 3.25. Venetian Workshop (?), Fragment of verre églomisé originally from Fra Guglielmo's Pulpit, ca. 1270, San Giovanni Fuorcivitas, Pistoia.

Fig. 3.26. Simone Martini, Detail of *St. Louis of Toulouse,* ca. 1317, Museo Nazionale di Capodimonte, Naples.

Fig. 3.27. Paolo di Giovanni Fei, Detail of *Madonna and Child* showing Christ*,* 1370s, Metropolitan Museum of Art, New York.

Fig. 3.28. Paolo di Giovanni Fei, Detail of *Madonna and Child* showing *Angel Gabriel and Virgin Annunciate,* 1370s, Metropolitan Museum of Art, New York.

Fig. 3.29. Lorenzo Monaco, *Virgin and Child Enthroned with Saint John the Baptist and Saint John the Evangelist,* ca. 1400, Musée du Louvre, Paris.

Fig. 4.1. Eastern Mediterranean Workshop, *Chair of St. Peter*, backrest from eleventh-twelfth century combined with earlier elements, Basilica con Cattedrale di San Pietro di Castello, Venice.

Fig. 4.2. Iranian or Egyptian Workshop, *Glass Cup*, ca. ninth-tenth century; Byzantine Workshop, *Mount for Cup*, tenth-eleventh century, Procuratoria di San Marco, Venice.

Fig. 4.3. Egyptian Workshop, *Rock Crystal Vase,* late tenth century; Venetian Workshop, *Mount for Vase*, mid-thirteenth century, Procuratoria di San Marco, Venice.

Fig. 4.4. Roman or Palestinian Workshop, *Glass Pilgrim Vessel*, late sixth-early seventh century, Metropolitan Museum of Art, New York.

Fig. 4.5. Fatimid Workshop, *Crystal Flask*, eleventh-fourteenth century; European Workshop, *Mount*, fourteenth century, British Museum, London.

Fig. 4.6. Fatimid Workshop, *Crystal Flask*, tenth-eleventh century; German Workshop, *Mount for Reliquary with Tooth of Saint John the Baptist,* ca. 1375, Art Institute of Chicago, Chicago.

Fig. 4.7. German Workshop, *Cross of Nikomedes of Borghorst with two Fatimid Crystals*, ca. 1050, Pfarrgemeinde St. Nikomedes, Steinfurt-Borghorst.

Fig. 4.8. Venetian Workshop, *Beaker from the "Aldrevandin Group,"* early fourteenth century, British Museum, London.

Fig. 4.9. Syrian Workshop, *Two Beakers*, ca. 1260, Walters Art Museum, Baltimore.

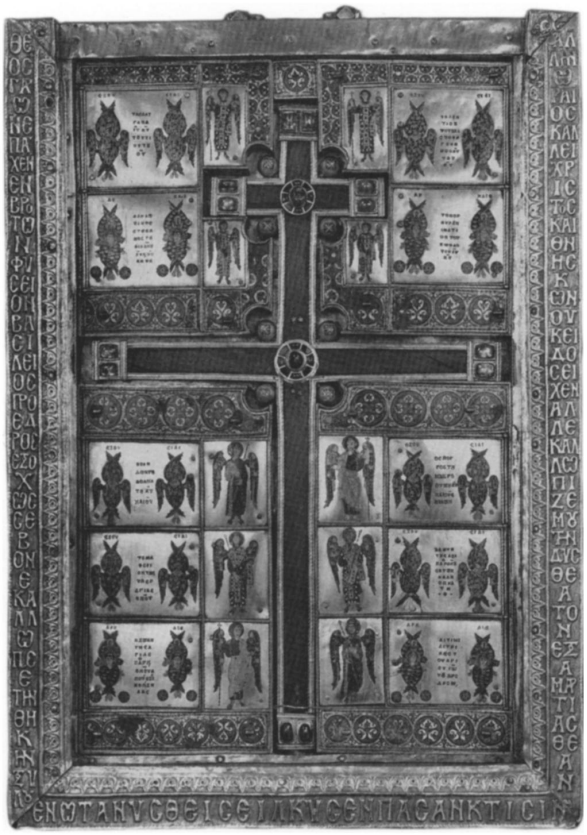

Fig. 4.10. German Workshop, *Limburger Staurotheke*, 968-985, Diözesanmuseum, Limburg.

Fig. 4.11. Byzantine Workshop, *Skull Relic of St. James the Younger,* before 1204, Domschatzverwaltung, Halberstadt.

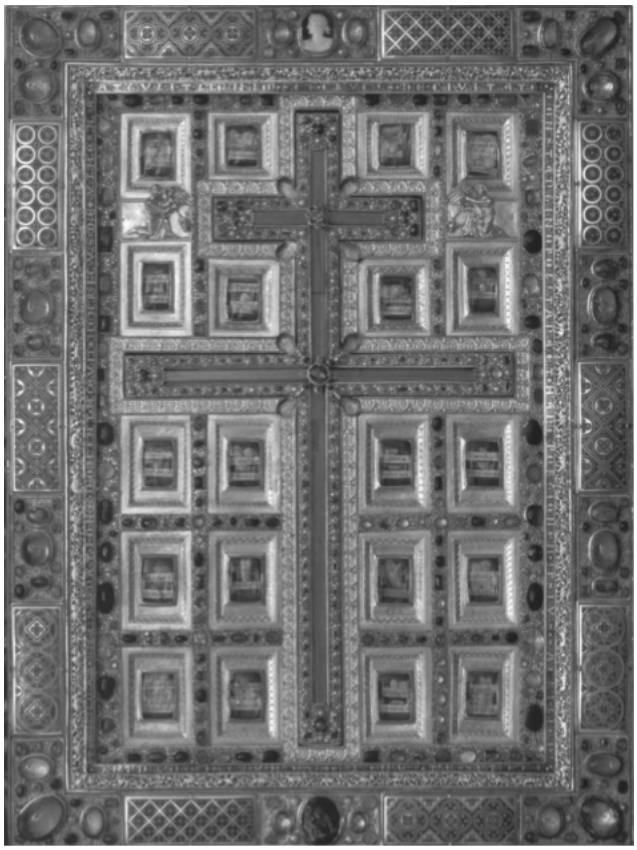

Fig. 4.12. German Workshop, *True Cross Reliquary*, ca. 1230-1240, St. Matthias Treasury, Trier.

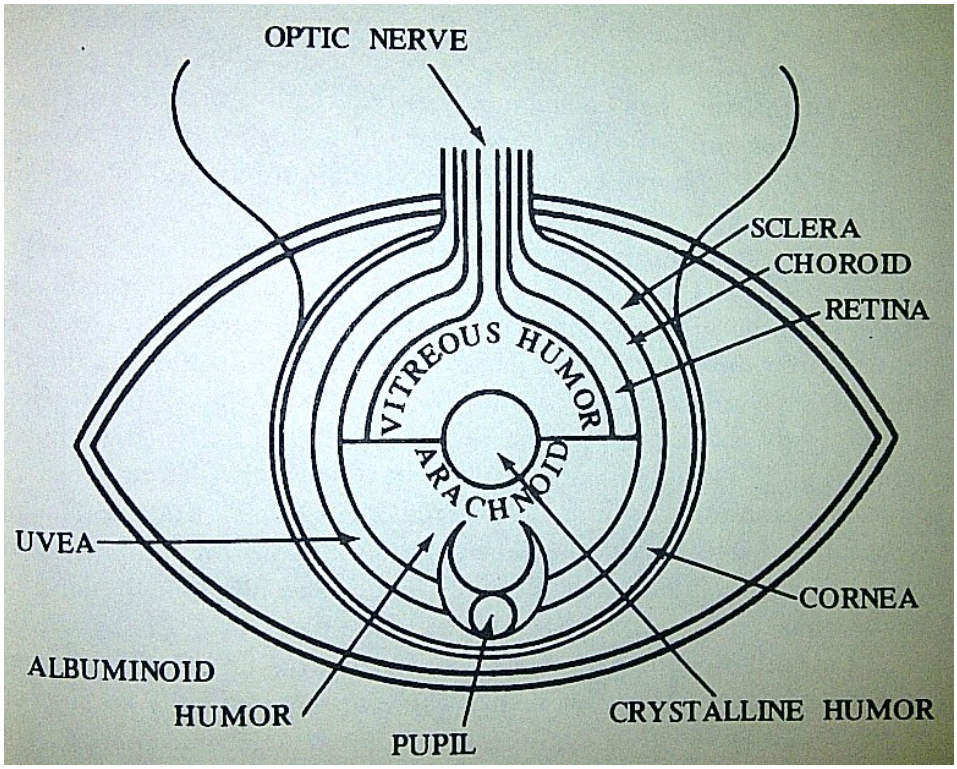

Fig. 4.13. Hunain ibn Ishaq, *Diagram of the Eye*, illustration from Lindberg, *Theories of Vision*.

Fig. 5.1. Naddo Ceccarelli, *Reliquary Tabernacle with Virgin and Child*, ca. 1350, Walters Art Museum, Baltimore.

Fig. 5.2. Lippo Vanni, *Reliquary with Virgin and Child with Saints,* ca. 1350-1359, Walters Art Museum, Baltimore.

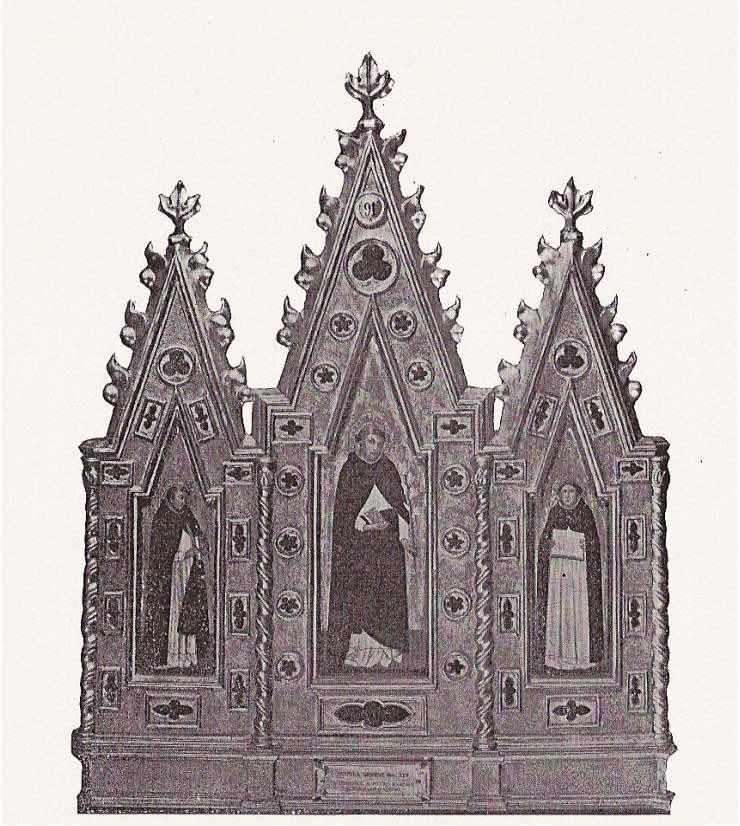

Fig. 5.3. Lippo Vanni, *Reliquary Triptych,* ca. 1350-1400, Vatican Gallery, Rome.

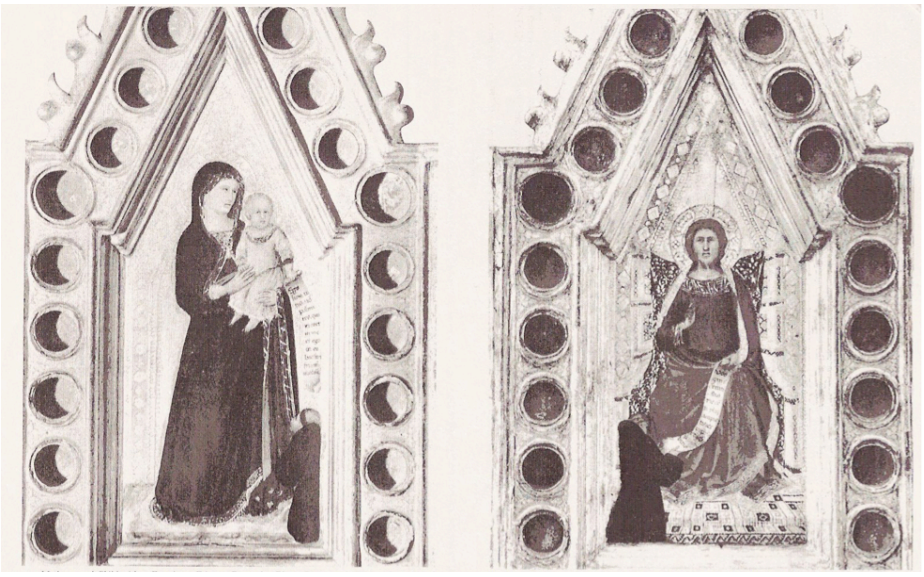

Fig. 5.4. The Master of the Dijon Tabernacle, *Reliquary with Madonna and Child and Franciscan Friar and Donor,* mid-thirteenth century, Berenson Collection, Settignano; *Christ Blessing a Franciscan*, mid-thirteenth century, Private Collection, Rome.

Fig. 5.5. Francesco di Vannuccio, *Reliquary Tabernacle,* ca. 1355-1390, formerly in the A. S. Drey Collection, Munich.

Fig. 5.6. Francesco di Vannuccio, *Reliquary with Madonna and Child and Saints John the Baptist, Paulinus of Nola, and Louis of Toulouse,* ca. 1355-1390, Museo Civico, Montepulciano.

Fig. 5.7. Bartolo di Fredi, *Reliquary Triptych with the Annunciation, St. Ansanus, the Adoration of the Magi, and the Crucifixion*, ca. 1370, Private Collection, London.

Fig. 5.8. Simone dei Crocifissi, *Reliquary Triptych with Madonna and Child*, ca. 1360-1370, Musée du Louvre, Paris.

Fig. 5.9. Simone dei Crocifissi, *New Testament and Apocryphal Scenes with Saints,* ca. 1360-1370, Walters Art Museum, Baltimore.

Fig. 5.10. Giotto, *Prudence*, ca. 1305, Arena Chapel, Padua.

Fig. 5.11. Giotto and Workshop, Detail from *Obedience*, ca. 1330, Lower Church, San Francesco, Assisi.

Fig. 5.12. Ambrogio Lorenzetti, *Maestà*, ca. 1335-1337, Museo di Arte Sacra, Massa Marittima.

Fig. 5.13. Ambrogio Lorenzetti, Detail of *Maestà*, ca. 1335-1337, Museo di Arte Sacra, Massa Marittima.

Fig. 5.14. Ambrogio Lorenzetti, Detail from *The Allegory of Bad Government*, ca. 1337-1340, Palazzo Pubblico, Siena.

Fig. 5.15. Ambrogio Lorenzetti, Detail from *The Allegory of Good Government*, ca. 1337-1340, Palazzo Pubblico, Siena.


Fig. 5.16. Tommaso da Modena, *Cardinal Hugh of St. Cher,* ca. 1352, Chapter House of San Nicolò, Treviso.

Fig. 5.17. Tommaso da Modena, *Nicholas of Rouen,* ca. 1352, Chapter House of San Nicolò, Treviso.

Fig. 5.18. Tommaso da Modena, *Pietro Isnardo da Chiampo of Vicenza,* ca. 1352, Chapter House of San Nicolò, Treviso.

Fig. 5.19. Andrea dei Bartoli, *Philosophers Confronting St. Catherine*, ca. 1367, Chapel of St. Catherine of Alexandria, Lower Church of St. Francis, Assisi.

Fig. 5.20. Giusto de'Menabuoi, *Miracle of the Tower,* ca. 1382, Chapel of the Beatified Luca Belludi, Basilica of St. Anthony, Padua.

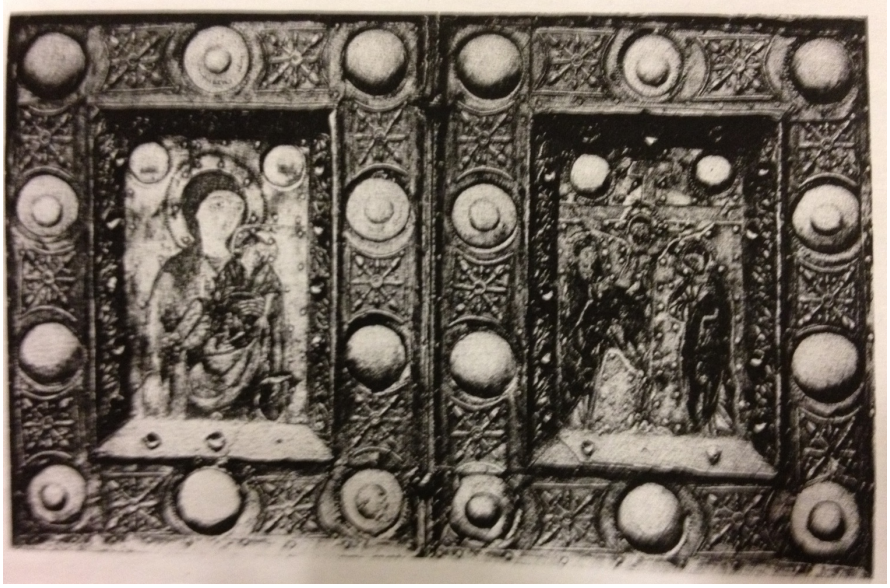

Fig. 5.21. Sienese School, *Reliquary Diptych*, late-thirteenth century, formerly in the Comte Georges de Piolant Collection, Poitiers.

Fig. 5.22. Mosan Workshop, *End of a Reliquary Shrine with the Triumphant Christ,* panel: late-eleventh century, frame: thirteenth century, Walters Art Museum, Baltimore.

Fig. 5.23. Master of Sant'Alo', *Reliquary Diptych with Virgin and Child with Saints,* ca. 1300-1350, The Victoria and Albert Museum, London.

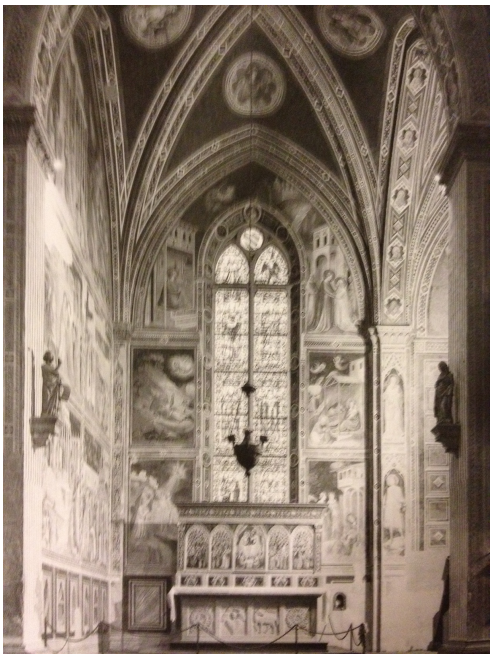

Fig. 5.24. Giovanni di Balduccio, *Angel Gabriel* (on the left of the entry portal) and the *Virgin Annunciate* (on the right of the entry portal), ca. 1327, Baroncelli Chapel, Santa Croce, Florence.

Fig. 5.25. Bartolo di Fredi, *The Coronation of the Virgin*, ca. 1388, Museo Civico e Diocesano d'Arte Sacra, Montalcino.

Fig. 5.26. Angelo di Nalduccio, *Virgin Annunciate* and *Angel Gabriel*, ca. 1370, Museo Civico e Diocesano d'Arte Sacra, Montalcino.

Fig. 6.1. Umbrian Workshop, *Reliquary Diptych*, mid-to late-fourteenth century, Metropolitan Museum of Art, New York.

Fig. 6.2. Tommaso da Modena, *Reliquary Panel*, ca. 1360, Walters Art Museum, Baltimore.

Fig. 6.3. Tommaso da Modena, Detail of *Reliquary Panel*, ca. 1360, Walters Art Museum, Baltimore.

Fig. 6.4. Tommaso da Modena, Detail of *Reliquary Panel*, ca. 1360, Walters Art Museum, Baltimore.

Fig. 6.5. Italian Workshop, *Verre Églomisé Reliquary Roundel*, fourteenth century, Metropolitan Museum of Art, New York.

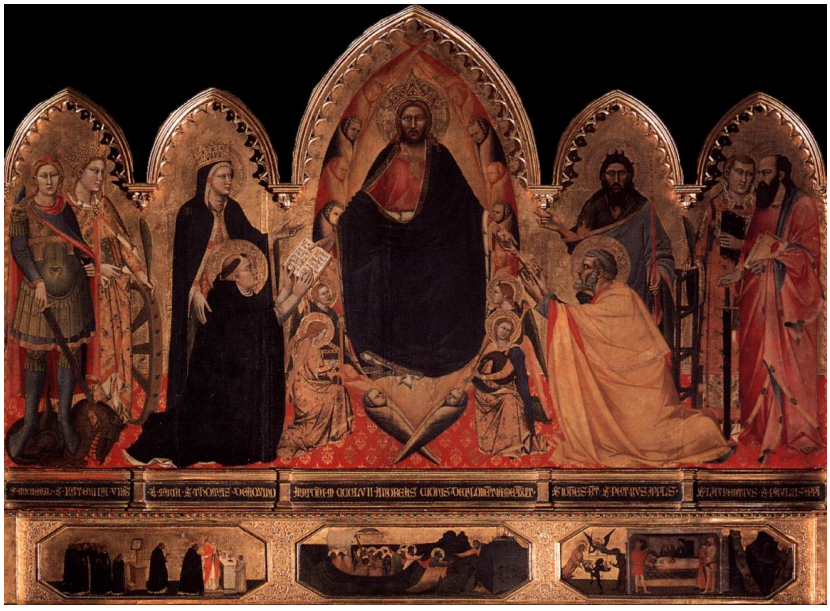

Fig. 6.6. Orcagna, *Strozzi Altarpiece*, 1354-37, Santa Maria Novella, Florence.

Fig. 7.1. Sienese Workshop, *Reliquary Frame*, 1347, Cleveland Museum of Art, Cleveland.

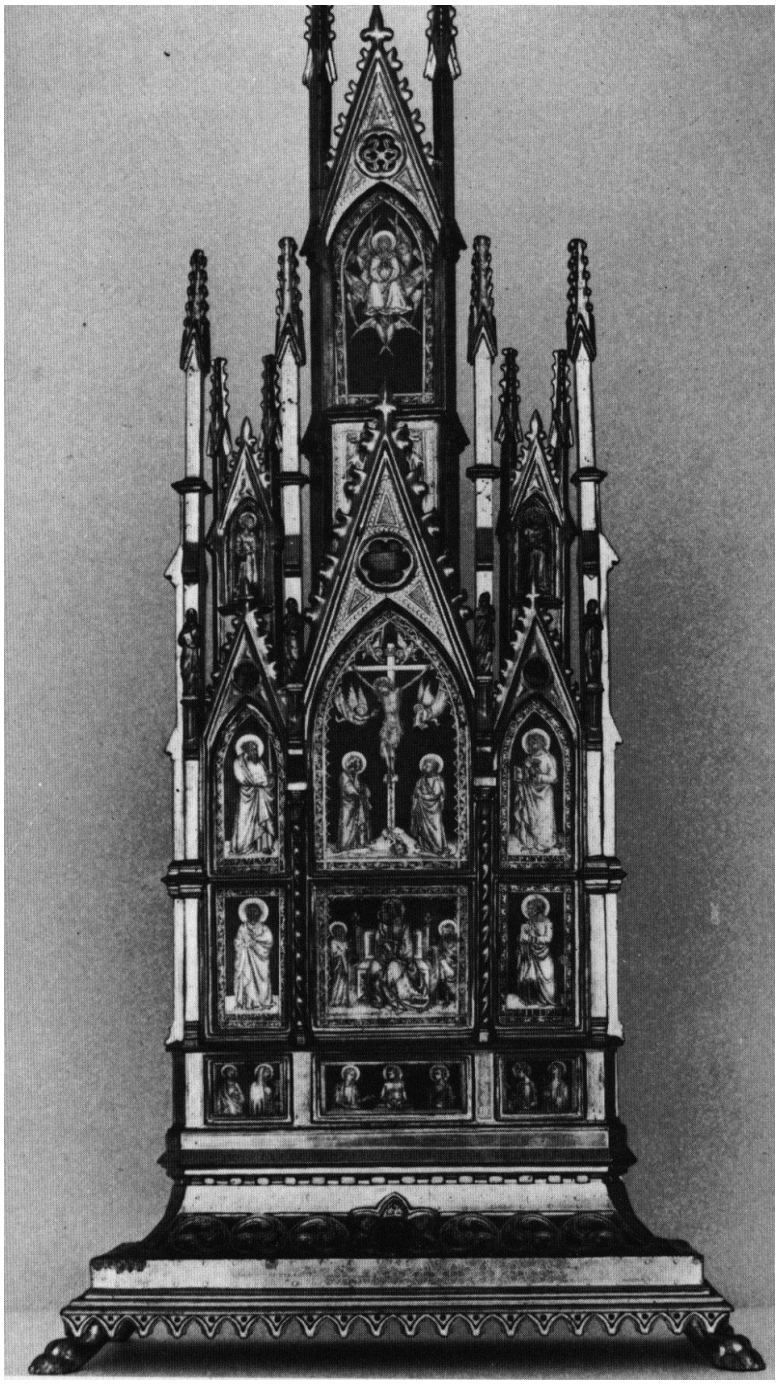

Fig. 7.2. Sienese Workshop, *Reliquary in the Form of a Triptych*, ca. 1340, Società degli Esecutori delle Pie Disposizioni, Siena.

Fig. 7.3. Sienese Workshop, *Verre Églomisé Panel* originally from *The Reliquary in the Form of a Triptych*, ca. 1340, Fitzwilliam Museum, Cambridge.

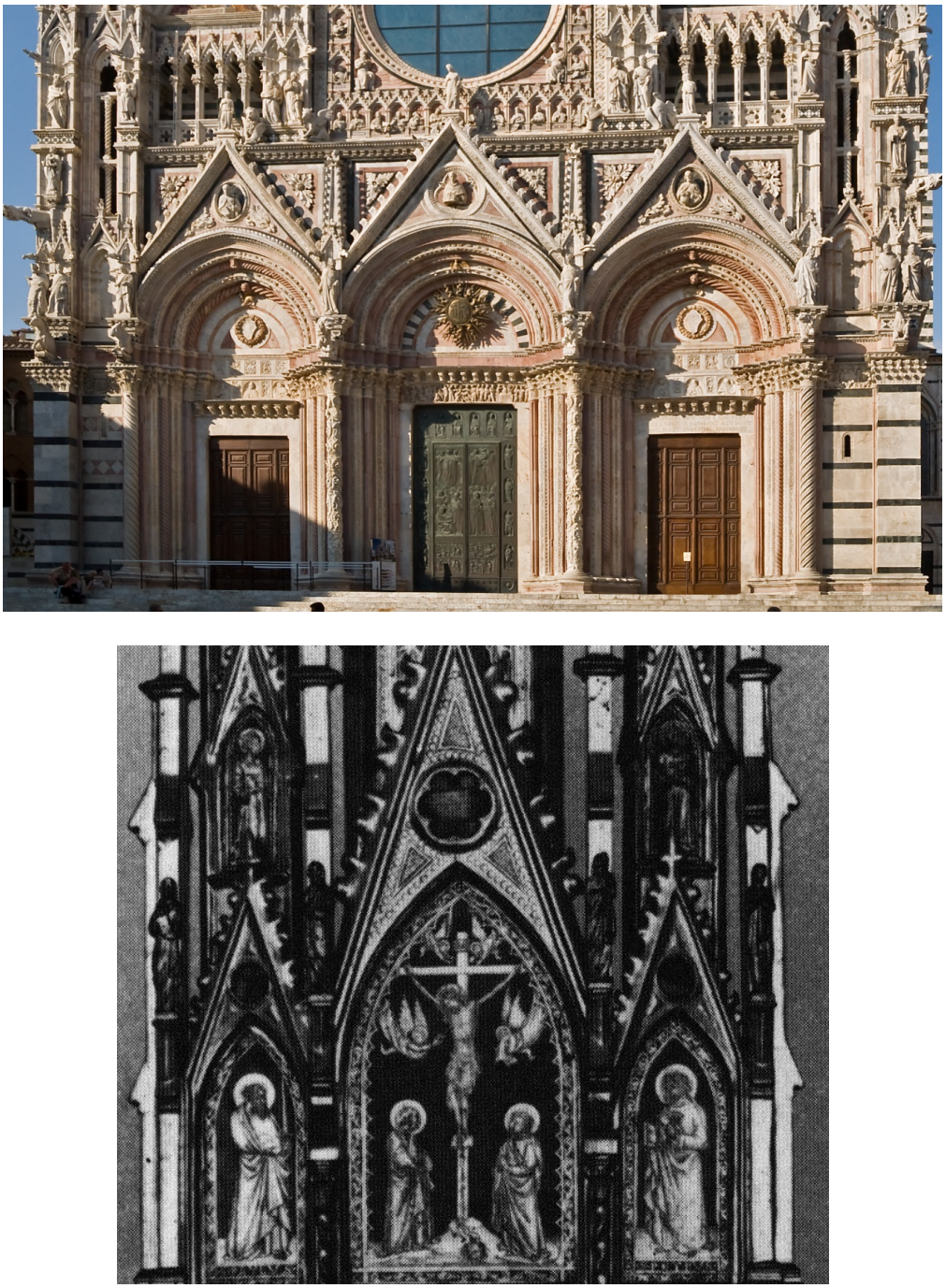

Fig. 7.4. (top) Giovanni Pisano and others, *Lower Register of the Siena Cathedral Façade*, late-thirteenth to early-fourteenth centuries, (bottom) Sienese Workshop, Detail of *Reliquary in the Form of a Triptych* (Fig. 7.2).