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Book Review

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The Mirror, the Window, and the Telescope: How Renaissance Linear Perspective Changed Our Vision of the Universe

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Reviewed by the author

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My new book, *The Mirror, the Window, and the Telescope: How Renaissance Linear Perspective Changed Our Vision of the Universe*, both revises and extends my earlier, but now out of print (in English), *Renaissance Rediscovery of Linear Perspective* (New York, 1975/6). Furthermore, it also draws from my subsequent book, *The Heritage of Giotto's Geometry: Art and Science on the Eve of the Scientific Revolution*, (Cornell University Press, Ithaca, NY, 1991/3). The subject once again has to do with the inception of geometric linear perspective in the pictorial arts during the early Renaissance. I begin by tracing the reasons why this mathematical method was conceived only in Western Christendom (no other culture in the world had ever invented it independently before). The failure of the Crusades, the loss of Jerusalem, and schismatic divisions within the Church itself had badly weakened the Faith by the late Middle Ages, and many felt that religious imagery needed to be refreshed in order to help rekindle Christian fervor. Some application of the revived ancient science of Euclidian geometry might be the answer.

While there had been a slow, empirical movement in this direction since the fourteenth century, the first application of optics – the geometric sub-science of vision and light – to the painting of pictures is credited to Filippo Brunelleschi of Florence, Italy. Around 1425 he demonstrated how a familiar building in the city, the Baptistery beside the Cathedral, could be painted in a picture exactly as it appeared in a mirror reflection. Furthermore, the test he devised to prove the “realism” of his unique painting was that the viewer should hold it in one hand and peak through a hole drilled though the backside, with the painted-side reflected in a mirror held before it in the other hand. In other words, the viewer was to judge the picture's verity not by comparing the image to the actual building, but only by comparing it to its own mirror reflection. I argue that the reason for this peculiar test had more to do with medieval religious assumptions than any prescient anticipation of modern science. In fact, what Brunelleschi hoped to reveal was the very process by which God created the universe at Genesis when he projected it into the void as mirrored from his divine mind's eye. Brunelleschi believed, as did all good Christians during the Middle-Ages, that living mortals are permitted to view the

world only as a pale reflection of true “reality” in heaven, just as Saint Paul stated in his Epistle to the Corinthians I, 13:12, “At present we see indistinctly, as in a mirror, but then [in heaven] face to face.”

Brunelleschi quickly communicated the principles of this new perspective to his artist friends, Donatello, Masaccio, Masolino, and Fra Angelico. However, there was still a problem concerning its acceptance. Some painters, like Fra Angelico, began to worry that geometry by its very definition referred only to “earth measure.” While linear perspective was the optically correct means for representing the material world, it might be incorrect and even profane when applied to depictions of ineffable heaven and sacred mysteries.

Thus in 1435/6, the humanist scholar and fellow Florentine Leon Battista Alberti decided to rectify the matter in a treatise called *De Pictura*, On Painting. First, he codified Brunelleschi’s perspective rules into a simple formula that even mathematically disadvantaged artists could understand, and next he replaced Brunelleschi’s mirror with a gridded window as the ultimate test for pictorial “reality.” In other words, by looking through a window the geometric beauties of this world were revealed without the theological implications of a mirror reflection. Moreover, Alberti stressed that the proper subjects to be depicted in his perspective window need not necessarily be religious but were preferably the historical events of ancient Greece and Rome. Paintings of these secular but still hallowed classical stories should then serve as didactic models for the moral edification of living viewers. The proper purpose of geometric linear perspective was therefore to make it possible for artists to represent nature not as divine mystery but idealized as worldly perfection.

Alberti’s book, subsequently printed in 1540, spread the new concept everywhere in Italy and transalpine Europe. Indeed, “Alberti’s window” became the trademark of High Renaissance art, especially by way of Raphael’s proliferating influence. Raphael was perhaps the most effective sixteenth-century promulgator of Alberti’s classical vision. While he and his followers still painted beautiful pictures of religious subject matter, their images of holy personages were posed more often to look like Olympian gods than ascetic Christian saints. Even their representations of supposedly ethereal heaven appeared more and more like manicured earthly landscapes. In fact, Renaissance artists in general tended to frame heavenly space according to the same Albertian rules, as if it were seamlessly contiguous with mundane space in spite of orthodox Christian doctrine.

Finally, I show how these new applications of linear perspective even influenced Galileo Galilei in the early seventeenth century. In fact the new telescope that the Florentine physicist and astronomer constructed followed the same optical principles that had been the basis of Brunelleschi’s and Alberti’s pictorial experiments. He most famously pointed it at the skies to observe the moon and other planets. Being also an expert in perspective and *chiaroscuro* (light and dark) drawing, he was able for the first time ever to understand that the heretofore “strange spottedness” of the moon was actually caused by the shades and shadows of high mountains and deep valleys. He even drew his own perspective pictures of the rugged lunar surface which were published in his sensational book, *Sidereus Nuncius* (Starry Messenger) printed in 1610, demonstrating beyond any doubt that the moon, the immaculate pearl in Dante’s poetic ascent to Paradise, was hardly the smooth sphere exuding heavenly perfection as always assumed by the Church.

Moreover, Galileo's telescope, called at the time a "perspective tube," verified what Renaissance artists were already depicting. What it indeed revealed was that the earth was not necessarily a mirror reflection of the heavens as Brunelleschi's mirror had advocated, but just the other way around.

This book updates my earlier books on perspective because I am adding new evidence concerning the intellectual ambience of Florence, Italy, during the early fifteenth century. I also submit new evidence derived from examination of works of art from the years between 1413 and 1436 regarding the date and methods employed by the first Florentine artists who adapted the rules of optical science to their traditional, empirical understanding of visualized nature.

The book is also a sequel because of my concern that the subject of perspective in the arts has fallen victim to a wave of art criticism which no longer considers it a positive idea; that perspective has instead actually inhibited innate artistic expression, even becoming an imperialist means to colonize the cultures of non-Western societies. Indeed, there is a tendency nowadays to downgrade the importance of perspective as merely a brief side-track in the evolution of world art. Thus, I try to re-connect the advent of perspective to its roots in the intense religious and moral preoccupations of the European late Middle Ages, to the "period eye" of the Renaissance in Michael Baxandall's famous phrase. Whatever one may say about the eventual use or misuse of geometric perspective as a tool of Western political power, it was surely conceived in the early fifteenth-century as a very medieval Christian solution to a very medieval Christian problem. It must be understood in the context of the strongly held spiritual beliefs and assumptions of still devout Christians who longed for painted and sculpted images that could arouse the feeling of divine presence and reinforce their faith that God and his saints were still immanent in their daily lives.

I have found strong testimony to this in the preaching of Fra Antonino Pierozzi (1389-1459), Dominican prior of the San Marco convent (when Fra Angelico painted there) who then became the influential Archbishop of Florence. While the writings of Antonino (eventually canonized as St Antonine) have received some attention from modern scholars, I believe I am the first to single out his considerable views on optics, indicating just how au courant this subject was in fifteenth-century Florence. I speculate with good circumstantial reason that among the avid listeners to Antonino's popular sermons was none other than Filippo Brunelleschi.

In the same light, I offer new analyses and interpretations of art by Masaccio, Masolino, Donatello and Fra Angelico before and after 1425 that surely indicate that Brunelleschi must have performed his famous perspective demonstrations on or about that year. Also I will show that these artists exhibited most of the same perspective principles and short-cuts in their own works between 1425 and 1435 that Leon Battista Alberti described in his *De Pictura* after 1435, thus indicating further that his own famous perspective system was basically a verbal codification of what Brunelleschi had already achieved pictorially ten years before.

About the author

Samuel Y. Edgerton is Amos Lawrence Professor of Art History Emeritus at Williams College, where he taught for twenty-seven years, and at Boston University for sixteen years before that. During those four plus decades his scholarly interests have ranged from studying the arts of medieval and Renaissance Europe to the arts of pre- and post-conquest America. However, the

single thread that unites the seemingly diverse subjects of his books is his desire to reveal how the history of art interacted with the ideologies and social institutions of these diverse cultures, such as the way art was deployed in the service of the criminal justice system in still medieval Florence, or the way Spanish missionaries used the arts to help convert the indigenous peoples of sixteenth-century Mexico. Edgerton's latest work again traces the advent of artistic linear perspective, how it was originally conceived to reinforce the devotional power of Christian pictures; how it then became the universal trademark of Renaissance artistic "realism"; and finally how perspectival art allowed Galileo Galilei to "see" scientifically for the first time the true form of our heavenly universe.